A BETTER SOLUTION FOR EXTRASYLLABICITY THAN EXTRASYLLABICITY

(1) in a nutshell

a. why is there extrasyllabicity in phonological theory? Two and only two reasons:
   1. reason 1: enforced underparsing, too many consonants at word edges, syllabification algorithms break down.
   2. reason 2: deliberate underparsing in case word-final consonants do not behave as Codas [interestingly, no parallel for word-initial consonants].

b. overgeneration: reason 1 sets up a mechanism that makes a wrong prediction: there could be sequences of any number of extrasyllabic consonants, i.e. #tplfkbrmkV… where #tplfkbrm is an extrasyllabic string. Needless to say, such a situation is not found in natural language. In actual fact, there does not seem to be a language where more than one consonant at a time is extrasyllabic. ==> case study of a language with a wild reputation: Polish.

c. reason 2 is theory-dependent: what could a word-final consonant be if it is not a Coda? There is another candidate constituent that accommodates consonants: the Onset. However, classical syllabic theories based on Kahnian syllabification algorithms cannot even imagine that word-final consonants are Onsets, so by default they must stand astray. Government Phonology can imagine that they are Onsets, it actually claims that ALL word-final consonants are Onsets.

d. on the other hand, there are two reasons why there can be no extrasyllabicity in Government Phonology:
   1. strings are fully syllabified in the lexicon; there is no syllabification algorithm.
   2. resyllabification is outlawed, hence nothing can stand astray at some derivational stage and "later" be readjoined to some constituent.

e. undergeneration: however, Standard Government Phonology (Kaye et al. 1990, Kaye 1990) has a serious problem of empirical coverage: it is unable to accommodate both situations where word-final consonants show paired vs. impaired behaviour in regard of word-internal Codas. A wrong prediction is made to the effect that word-final consonants NEVER behave like word-internal Codas.

f. purpose of this talk: to show that both the classical extrasyllabic solution and the undergenerating position of Standard Government Phonology fail for the same reason: they try to cover the parameter "word-final consonants show paired vs. impaired behaviour in regard of internal Codas" by contrasting arboreal structures: Coda vs. Onset vs. extrasyllabic. Standard Government Phonology undergenerates because syllable structure cannot be parameterised.1

g. CVCV (Lowenstamm 1996) dispenses with syllabic arborescence altogether. Syllable-based processes are the result contrasting lateral relations that hold among segments. Syllabic arborescence cannot be parameterised, lateral relations can.

h. CVCV offers an account for the "extrasyllabicity" that does not suffer from either the classical overgeneration nor the Standard Government Phonology undergeneration.

1 Doing so, as suggested by Piggott (1991,1999), leaves us with something that does not look very much like Government Phonology anymore.
1. **How Extrasyllability Works: Procedural Mechanics**

(2) a. strings are unsyllabified in the lexicon.

b. they are assigned syllable structure by a syllabification algorithm in the course of the phonological derivation.

c. the algorithm underparses the string (either forced or deliberately) and leaves some consonants unsyllabified.

d. regular phonological rules apply.

e. somewhere at a later stage in the derivation, the stray consonants are reintegrated into the "prosodic hierarchy" by some Adjunction Rules. Common autosegmental background: no segment can have a phonetic existence if it is not attached to some constituent ('stray erasure').

f. there are various opinions on the precise object to which extrasyllabic consonants are adjoined: syllabic constituents, the "prosodic word", the "phonological word", the foot etc.

1. to syllabic constituents, e.g. German (Hall 1992:122ss)
   
   | Jagd [jaakt] "hunt (noun)"
   | Jagd-en [jaakd-an] "hunts"

   the /–d/ is extrasyllabic, but undergoes final devoicing (=in Codas). Hence, it is adjoined to the Coda before final devoicing applies.

   Consequence: sonority sequencing is completely released "on the surface", i.e. anything and its reverse can be a branching Onset "on the surface". Hall (2000:248): sonority sequencing governs "deeper", but not phonetic representations.

2. to the phonological word, e.g. Polish (Rubach & Booij 1990)
   
   | kadr [katr] "strip from a film"
   | kadrek [kadrek] "id., diminutive"

   thus /-d/-, /-r/ is transparent for final devoicing, i.e. is extrasyllabic. Consequence: there is no restriction on what the "phonological word" can dominate: anything and its reverse.

2. **Enforced Underparsing**

(3) situations that give rise to extrasyllabic interpretations

**Reason one at the left edge:** enforced underparsing, too many consonants around

a. word-initial #RT-sequences (T=any obstruent, R=any sonorant)

   - example: Czech rty "lips", lhát "to lie", etc.

---

2 There is another case argued for in the literature on Polish (Rubach & Booij 1990, Rubach 1997 etc.): so-called trapped consonants. Example: the [r] in trwać "to last", the [n] in czosnku "garlic GENsg". This is problematic since there is a broad consensus that extra-X (-syllabic, -metrical, -pedal etc.) objects can only occur at edges of the respective units: see e.g. Roca (1994:213), Spencer (1996:246).
b. cross-linguistic situation
IE languages on record: Slavic (massive), Greek (only #pt-, #kt-, #mn-)
non-IE languages: Modern Occidental Arabic (e.g. Moroccan Arabic) and Berber
Other languages with initial #RT-clusters exist, but their distribution over the globe
and according to genetic kinship appears to be erratic, cf. Clements (1990).

(4) illustration
initial extrasyllabic consonants: Polish *rdza* [rdza] "rust"

<table>
<thead>
<tr>
<th>stray after syllabification</th>
<th>in Appendix after syllabification</th>
</tr>
</thead>
<tbody>
<tr>
<td>after syllabification</td>
<td>after syllabification</td>
</tr>
<tr>
<td>surface</td>
<td>surface</td>
</tr>
<tr>
<td>adjoined to syllabic</td>
<td>adjoined to syllabic</td>
</tr>
<tr>
<td>constituents</td>
<td>constituents</td>
</tr>
<tr>
<td>O N</td>
<td>O N</td>
</tr>
<tr>
<td># r dz a</td>
<td># r dz a</td>
</tr>
</tbody>
</table>

![Diagram](image)

Rubach & Booij (1990)

(5) situations that give rise to extrasyllabic interpretations
**reason one at the right edge**: enforced underparsing, too many consonants around
a. heavy word-final clusters
   example: English sixths, German Herbst "autumn" etc.
b. cross-linguistic situation
   common, BUT
   1. a whole lot of these clusters are heteromorphemic, e.g. English:
      six-th-s [siks-ø-s], no such monomorphemic final (nor internal) clusters
      interpretation in Government Phonology: domain-final empty Nuclei,
      [[siksø]øsø]
   2. these clusters are restricted by some melodic property, e.g. German(ic), English:
      "supernumerary" consonants are always dentals.
(6) illustration
final extrasyllabic consonants: German Herbst [heχpst] "autumn"

<table>
<thead>
<tr>
<th>straying after syllabification</th>
<th>surface adjoined to syllabic constituents</th>
</tr>
</thead>
<tbody>
<tr>
<td>σ</td>
<td>R</td>
</tr>
<tr>
<td>O N C</td>
<td>h e r b s t</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>in Appendix after syllabification</th>
<th>surface adjoined to syllabic constituents</th>
</tr>
</thead>
<tbody>
<tr>
<td>σ</td>
<td>R</td>
</tr>
<tr>
<td>O N C App</td>
<td>h e r b s t</td>
</tr>
</tbody>
</table>

3. DELIBERATE UNDERPARSING

(7) situations that give rise to extrasyllabic interpretations

reason two: deliberate underparsing, word-final consonants do not behave like Codas

a. absence of Coda-effect on word-final consonants themselves:
   internal Codas react, but final Codas do not.
   example: l-vocalisation in French.
   compare with Brazilian Portuguese, where [l] vocalises in both internal and final Codas.

b. absence of Coda-effect on the vowel preceding final consonants:
   vowels in internal closed syllables react, but they remain untouched in final closed syllables.
   example: Icelandic Closed Syllable Shortening.
   compare with Czech, where vowels shorten in both internal and final closed syllables.

---

3 Goldsmith (1990:135ss) operates with a kind of Appendix he calls "Ω", and which is converted into a syllable on its own by rule at some derivational stage.
### Effects on Codas

#### Internal ≠ final Coda: French l-vocalisation (diachronic event)

<table>
<thead>
<tr>
<th>Onset</th>
<th>V</th>
<th>V</th>
<th>C</th>
<th>Coda</th>
</tr>
</thead>
<tbody>
<tr>
<td>lamina</td>
<td>lame</td>
<td>plaie</td>
<td>vela</td>
<td>voile</td>
</tr>
<tr>
<td>levare</td>
<td>lever</td>
<td>fleur</td>
<td>mule</td>
<td>mule</td>
</tr>
<tr>
<td>luna</td>
<td>lune</td>
<td>implire</td>
<td>emplir</td>
<td>dolore</td>
</tr>
<tr>
<td>lepore</td>
<td>lièvre</td>
<td>fab(u)la</td>
<td>fable</td>
<td>valere</td>
</tr>
</tbody>
</table>

#### Internal = final Coda: Brazilian Portuguese l-vocalisation

<table>
<thead>
<tr>
<th>V</th>
<th>V</th>
<th>V</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>sa[li]eiro</td>
<td>salt cellar</td>
<td>sa[w]</td>
<td>sa[l]</td>
</tr>
<tr>
<td>mu[l]a</td>
<td>suitcase</td>
<td>ma[w]</td>
<td>ma[l]</td>
</tr>
</tbody>
</table>

### Effects on the vowel preceding Codas

#### Internal ≠ final Coda

**Icelandic (Gussmann 2001): Closed Syllable Shortening only in internal closed syllables**

<table>
<thead>
<tr>
<th>long VV</th>
<th>short V</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. CVVCV</td>
<td>b. CVVTRV</td>
</tr>
<tr>
<td>staara</td>
<td>nee'pja</td>
</tr>
<tr>
<td>luudda</td>
<td>p'et'ri</td>
</tr>
<tr>
<td>fai:ri</td>
<td>aap'hri</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>long V</th>
<th>short V</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. CVV#</td>
<td>b. CVVT#</td>
</tr>
<tr>
<td>puu</td>
<td>8aak'h</td>
</tr>
<tr>
<td>t'voc</td>
<td>hœi's</td>
</tr>
<tr>
<td>fai:</td>
<td>k'h'vecel</td>
</tr>
<tr>
<td>prj'eev</td>
<td></td>
</tr>
</tbody>
</table>

#### Internal = final Coda

**Closed Syllable Shortening in both internal and final closed syllables**

<table>
<thead>
<tr>
<th>open syllable</th>
<th>closed syllable</th>
</tr>
</thead>
<tbody>
<tr>
<td>CV</td>
<td>C.CV</td>
</tr>
<tr>
<td>a. Turkish</td>
<td>meraak-i</td>
</tr>
<tr>
<td>b. Czech</td>
<td>kraav-a</td>
</tr>
<tr>
<td>cow NOMsg, diminutive NOMsg, GENpl</td>
<td></td>
</tr>
<tr>
<td>say 1sg, 2pl fem, imperative 2sg</td>
<td></td>
</tr>
</tbody>
</table>
4. EXTRASYLLABICITY IS NOT ONE: INITIAL AND FINAL EXTRASYLLABIC CONSONANTS SHOW CONTRASTIVE BEHAVIOUR

(13) Rubach & Booij (1990) show that word-final extrasyllabic consonants (due to enforced underparsing) and their word-initial peers do not behave alike
a. 1. teatr [teatr] – teatry [teatry], hence /-t/
   teatr wojenny [teadr wɔjɛnɛ] "war theatre"
   voice-assimilation affects the /t/ across 1) a word-boundary and 2) a word-final extrasyllabic consonant
   But no such assimilation across word-initial extrasyllabic consonants:
   2. no devoicing
      pod mchem [pɔd mɛxɛm] "under the nose"
      od mszy [ɔd mʃi] "since the mass"
   3. no voicing
      brak rdzy [brak rdɛzi]
b. 1. degemination = deletion of extrasyllabic consonants, i.e. the second part of a geminate is extrasyllabic in Coda-position
      flotylla [flɔtilla] "fleets NOMsg" - flotyll [flɔtɪl] "fleets GENpl"
      Sybilla [sibilla] "sibilla" - Sybilski [sibilski] "sibilla, adjective"
      hence: Sybil<->ski, flotyl<->
      2. no initial degemination of extrasyllabic consonants
      ssac [ssatʃ] "suck"
      na czczo [t̝tʲɔ] "on empty stomach"
      dżdżysty [dʒdʒiʃtɪ] "rainy"
c. two possible conclusions
   1. procedural: Rubach & Booij (1990)
      two different adjunction rules that apply at different derivational levels
      1. "Initial Adjunction" – early: before voice-assimilation and degemination
      2. "Housekeeping Adjunction" – late: after voice-assimilation and degemination
   2. representational:
      "extrasyllabic" consonants at both word edges are special, but they are special in two different ways. That is, the identity of the beginning of the word and of the end of the word is not the same. "Extrasyllabic" consonants do not form a homogeneous class.
      Or, in other words, it is a mirage to believe that there are two phonologies, regular (=internal) vs. extrasyllabic. There are three phonologies: regular (=internal) vs. initial vs. final.
      Phonological theory is called to find out about the identity of the two locations that produce special phonologies.
      1. initial: the phonological identity of the beginning of the word "#" is an empty CV unit (Lowenstamm 1999).
      2. final: all consonant-final words end in an empty Nucleus. It is the special properties of this final empty Nucleus that cause the special final phonology.
      More on final "extrasyllabicity" below.
5. Why is there no language with 7 or 23 extrasyllabic consonants?

(14) Prediction made by extrasyllabicity
   a. In case of enforced underparsing, the algorithm leaves astray all consonants that cannot be parsed.
   b. In case of # rtV, [r] remains unparsed; in case of # rgtV, [rg] remain unparsed and so forth: there can be as many underparsed consonants as the lexicon submits, hence no restriction on their number.
   c. In order to be phonetically interpreted, extrasyllabic consonants are adjoined to some constituent at a later derivational stage.
   d. Whatever the particular constituent chosen, it does not impose any restriction on the sonority slope or the number of consonants that it dominates.
   
   ==> there is no restriction on the number of extrasyllabic consonants.
   [e.g. Hall (2000:248): sonority sequencing governs "deeper", but not phonetic representations]
   
e. Sequences of three, five or eleven extrasyllabic consonants do not occur in natural language. For the left edge, it seems that the maximum number of extrasyllabic consonants is one.

(15) Illustration of the latter statement:
   Case study of one of the wildest extrasyllabic languages: Polish
   a. In two-membered initial clusters, one consonant at most can be extrasyllabic.
   b. The exhaustive list of three-membered initial clusters appears under (16) (following Rowicka 1999:309ss)
   Interpretation:
   1. Only stressable roots are considered, i.e. excluding roots with so-called trapped consonants, e.g. trwać "to last", which assimilate to syllabic consonants (Scheer 2003, forth)
   2. Only monomorphemic initial clusters are considered.
   3. $s+C$ sequences are notoriously odd lads. They count as one.
      "s" = [s,z,š,z,ż,S,Z]
      - #s+C clusters are not mentioned in table (16) they count as $C$
      - #CsC clusters count as $CC$
      etc.
   c. There are two four-membered initial clusters
      #pstr - pstrty "gaudy" = p-TR
      #pstry - pstrzyć "to mottle" = p-tʃ
   d. Result:
      All three-membered clusters identify as "C + TR", i.e. one single extrasyllabic consonant plus a cluster of rising sonority.
6. SUMMARY SO FAR

(17) we have seen that
a. reason one: for initial extrasyllabicity, "too many consonants around" actually reduces to "one supernumerary consonant around".

b. enforced underparsing (reason one) makes a wrong prediction: it allows for monster-sequences of extrasyllabic consonants.

c. deliberate underparsing (reason two) is theory-dependent: we are sure that word-final consonants in some languages do not belong to Codas. A theory that can conceive of them belonging to Onsets does not need to go down the extrasyllabic road at all.

7. AN ALTERNATIVE: LATERAL RELATIONS INSTEAD OF SYLLABIC ARBORESCENCE

(18) Standard Government Phonology
a. Standard Government Phonology (Kaye et al. 1990) is such a theory.
Kaye (1990): word-final consonants are not only able to belong to Onsets, they ALWAYS do. This is due to Coda Licensing ["Codas need to be licensed by a following Onset. Since there is nothing following a word-final consonant, it must be an Onset.]

---

4 The table is phonetic, which means that "rz" [ʐ], which alternates with "r" [r], is considered as a fricative, not as a liquid. Abbreviations: T=stop, Fric=fricative, Aff=affricate, N=nasal, Liqu=liquid, Gl=glide.
b. identity of word-internal Codas and word-final consonants

<table>
<thead>
<tr>
<th>word-internal Coda</th>
<th>word-final consonant</th>
</tr>
</thead>
<tbody>
<tr>
<td>R \ O \ N \ x \ x \ V \ C \ C</td>
<td>R \ O \ N \ x \ x \ C \ ø</td>
</tr>
</tbody>
</table>

c. hence, the pattern whereby internal and final "Codas" show impaired behaviour is predicted: they do not have the same syllabic identity.
d. however, Coda Licensing cannot be parameterised: word-final consonants cannot be Onsets in some languages, but Codas in others. Therefore, the reverse pattern, i.e. where both Codas behave alike, cannot be described.

(19) CVCV can
1. accommodate both patterns
2. without appealing to extrasyllabicity
a. What is CVCV ?
goal: the lateralisation of structure and causality in phonology.
b. syllabic constituency boils down to a strict consecution of non-branching Onsets and non-branching Nuclei. Some basic phonological objects:
closed syllable | geminate | long vowel | [...C#] | "branching Onset"
O  N  O  N     O  N  O  N     O  N  O  N     ...O  N     O  N  O  N
   |         |         |         |          |         |         |         |          |         |         |         |         |         |         |         |         |
C  V  R  ø     C  V  C  V     C  V  C  ø     T  ø  R  V
c. instead of being translated into the familiar arborescence, syllabic generalisations are described by two lateral relations:
1. Government (destructive)
2. Licensing (supporting)
cf. Ségéral & Scheer (2001)
(R = any sonorant, T = any obstruent)
d. lateralisation of structure:
structure is exclusively defined in lateral terms.
identity of the Coda: a consonant belongs to a Coda iff it occurs before a governed empty Nucleus.
internal Coda (boldfaced) final Coda (boldfaced)
e. **lateralisation of causality**: the reason for the existence of syllable-related processes are lateral relations.

WHY are Codas weak? Because they are ungoverned and unlicensed, viz. the Coda Mirror (Ségéral & Scheer 2001).

![Diagram of lateralisation of causality]

(20) the critical difference:

a. both classical models using extrasyllabicity and Standard Government Phonology define syllabic generalisations in terms of arboreal structure: a Coda and an Onset are different because they occupy different positions in the syllabic tree.

vs.

CVCV expresses the same generalisations by the presence vs. the absence of lateral relations: Coda = "consonant that occurs before a governed empty Nucleus" vs. Onset = "consonant that occurs before a filled (or an empty ungoverned) Nucleus."

b. syllabic trees cannot be parameterised, but lateral relations can.

(21) hence, the wavering behaviour of final Codas can be ascribed to the lateral actorship of final empty Nuclei (FEN):

a. effects on Codas
   1. languages where final Codas do react (= behave like internal Codas):
      FEN cannot license
   2. languages where final Codas do not react (= do not behave like internal Codas):
      FEN can license

b. effects on preceding vowels (= vowels in closed syllables)
   1. languages where vowels followed by final Codas do react (= behave like internal Codas):
      FEN cannot license
   2. languages where vowels followed by final Codas do not react (= do not behave like internal Codas):
      FEN can license
(22) summary: there are four basic nuclear objects

<table>
<thead>
<tr>
<th></th>
<th>lateral actorship</th>
<th>Licensing</th>
<th>empirical consequences</th>
</tr>
</thead>
<tbody>
<tr>
<td>full vowels</td>
<td>NO</td>
<td>always license</td>
<td>final Coda ≠ internal Coda i.e. neither final Codas nor the preceding vowel react</td>
</tr>
<tr>
<td>FEN</td>
<td>YES</td>
<td>+ licence</td>
<td>final Coda = internal Coda i.e. both final Codas and the preceding vowel react</td>
</tr>
<tr>
<td>schwa</td>
<td>YES</td>
<td>another time, cf. Rizzolo (forth), Scheer (2001, forth)</td>
<td></td>
</tr>
<tr>
<td>internal empty Nuclei</td>
<td>NO</td>
<td>never license</td>
<td></td>
</tr>
</tbody>
</table>

(23) general comparison

<table>
<thead>
<tr>
<th></th>
<th>CVCV: FEN can license</th>
<th>mainstream: extrasyllabicity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Closed Syllable Shortening occurs</td>
<td>before both internal and final Codas</td>
<td>NO</td>
</tr>
<tr>
<td></td>
<td>only before internal Codas</td>
<td>YES</td>
</tr>
<tr>
<td>lenition occurs</td>
<td>in both internal and final Codas</td>
<td>NO</td>
</tr>
<tr>
<td></td>
<td>only in internal Codas</td>
<td>YES</td>
</tr>
</tbody>
</table>

(24) conclusion

a. extrasyllabicity overgenerates monster-sequences of extrasyllabic consonants.
b. no word-final consonant needs to be extrasyllabic if theory can conceive of it belonging to an Onset.
c. Standard Government Phonology can. But it cannot express the parameter regarding the paired vs. impaired behaviour of internal and final Codas.
d. CVCV can do both: doing away with extrasyllabicity and accommodating both patterns. This is because of its very essence: the description of structure and causality by lateral, rather than by arboreal means.
e. we have seen how CVCV accounts for right-margin extrasyllabicity. But what about word-initial extrasyllabic consonants? Can CVCV avoid monster-sequences of extrasyllabic consonants? Yes: CVCV actually predicts that there can be one word-initial extrasyllabic consonant at most. More on this another time… (Scheer forth).

References


Scheer, Tobias forth. A Syntagmatic Theory of Phonology. Ms, University of Nice.


