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WE NEED A TRANSLATOR'S OFFICE, BUT THE BUFFER HAS TO GO: DIRECT INTERFACE

(1) purpose
   a. to build a **direct** interface theory, i.e. one without the buffer.
   b. the buffer is the arboreal morpho-syntactic structure that the dominant interface model, Prosodic Phonology (PP), replicates within the phonological module: the prosodic constituency (phonological words, phrases, utterances, intonational phrases).
   c. the buffer is a diacritic in the same way as #, + etc. are diacritics - only is it a diacritic in autosegmental cloths.
   d. PP has eliminated boundaries in favour of domains - only because boundaries exhale the ugly linear SPE-smell, while domains are beautifully autosegmental. This is erroneous: higher level information is handed down through **punctual** divisions, i.e. boundaries, not through domains (except mobile phenomena such as stress). Phonological rules make reference to boundaries, not to domains.
   e. summary:
      1. the central idea of PP that morpho-syntactic structure needs to be translated into phonology is correct (if for reasons that PP does not talk about, i.e. modularity): we need a translator's office.
      2. diacritics don't qualify: but the result of this translation must be a **pre-existing** phonological object that has a valid currency in phonology and therefore makes predictions.
      3. therefore the general architecture that I am advocating - without the buffer - is theory-neutral. The particular implementation thereof, however, is necessarily theory-specific since the output of the translator's office are truly phonological categories, and these are variable across theories.
      4. In the particular theory that I am working in, Government Phonology (CVCV), there are four and only four possible outlets of the translator's office, and they concern only two objects: the definition of the phonological properties of Final Empty Nuclei and the management of additional syllabic space (insertion of a CV unit). I present a few case studies for the sake of illustration.

I. Theory-unspecific part: Direct Interface, the buffer has to go

(2) the initial error: boundaries are replaced by domains
PP is a child of autosegmentalism - some historical comments
   a. since the neogrammarians through structuralism (juncture) and SPE (#,+,=), boundaries were the currency that transmitted higher level information to phonology.
   b. the older juncture/ boundary/ SPE interface literature is almost completely absent from the PP literature, which visibly did something like a tabula rasa.
   [e.g. Chomsky et al. 1956, Sag 1974, Basbøll 1975,1978a,b,1981a,b, McCawley 1968, Devine & Stephens 1976,1980, Stanley 1969,1973, Hyman 1978, Strauss 1979, Anderson 1974]

c. only Elisabeth Selkirk (1978, 1980a,b, esp. 1984) bridges SPE and PP (but not any more than basic SPE). She has been working on the phonology-interface in post-SPE-times, applying the SPE standards (Selkirk 1972, 1974).
In the early 80s when phonology was progressively autosegmentalised in every area, she clearly identifies the **only** motivation for abandoning boundaries in favour of domains:
if everything is autosegmental, so must the interface be, hence we must eliminate ugly linear boundaries and build some autosegmental, i.e. arboreal structure instead.

> "the syllables of phonological representation are arranged in some kind of hierarchical organization. […] By 'hierarchical organization' we mean, very roughly speaking, the organization of the units of phonological analysis into layers, vertically arranged on the same plane. […] This conception of phonological representation as having its own hierarchical structure(s) demands a radical rethinking of the relation between syntax and phonology. […] Thus the interpretation question - the question of the mapping between phonological representation and syntactic representation - takes on a much greater importance than in the standard theory, and has an entirely different quality to it. It must be viewed as a characterization of the relation between the syntactic hierarchy, on the one hand, and the phonological hierarchy (or hierarchies), on the other." Selkirk (1984:7f)

Therefore,

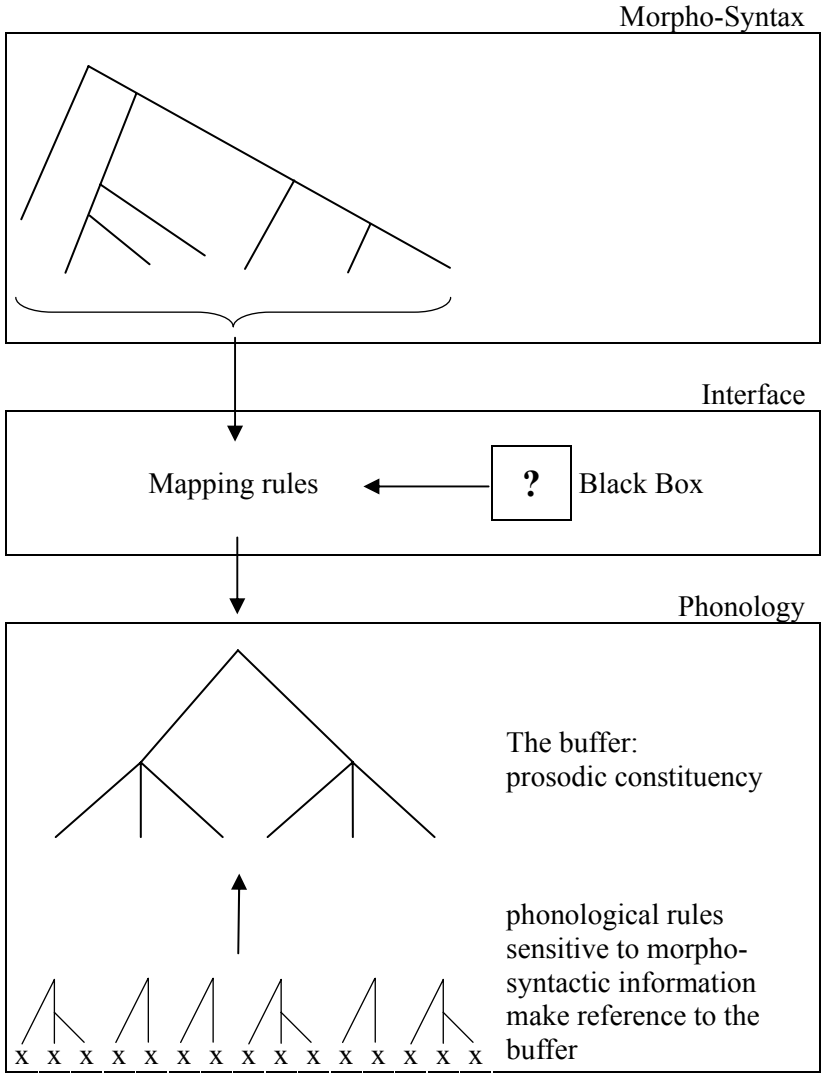
> "the junctural properties of sentences should be somehow represented 'suprasegmentally' rather than as the segmental boundaries of the standard theory. […] Thus the theory of phonological representation that we will advocate here eliminates segmental boundary elements altogether." Selkirk (1984:8)

d. already in Nespor & Vogel (1986), the most fundamental reference of PP, the transition with linear SPE plays no role anymore: domains are taken for granted.
The later PP literature does not examine this question anymore.
Since over 20 years PP stands unchallenged as the generative interface theory. The success may be appraised when considering that the units of PP - the phonological word, the phonological phrase etc. - have become descriptive categories in every-day conversation of phonologists.

(3) the central idea of PP: the buffer
==> reference to syntax is only indirect

a. how PP works: the buffer and its construction worker, the mapping rules.
b. mapping rules are the translator's office: they transform morpho-syntactic information into prosodic constituency, which lies inside the phonology.
c. crucially (cf. non-isomorphism below), morpho-syntactic information is not conditioning mapping rules alone: boundary-grouping may also be a function of genuine and language-specific instructions.
This is what I call the Black Box.
d. the nature of the buffer is a secondary question: the grid (Selkirk 1984) or the regular arboreal constituency of PP.

(4) the general architecture of Prosodic Phonology



(5) why the buffer exists

a. why should reference to morpho-syntactic structure be indirect? Why should phonology be burdened with several extra layers of arboreal structure and an extra mapping mechanism? Isn't this redundant?

b. direct-syntax approach: Kaisse (1985), Chen (1990), Odden (1987,1990).

c. basic argument against direct-syntax which has been repeated over and over again: **non-isomorphism**.
[Nespor & Vogel 1986: all through the book:4f,34ff,124ff etc., Vogel & Kenesei 1990, Nespor et al. 1996 etc.]

d. non-isomorphism is the claim that some phonological rules make reference to information that is not contained in the morpho-syntactic structure. That is, to domains that do not represent any single node on the m-synt side.

e. let us examine two examples:

1. mismatch of phonological and morpho-syntactic domains
[this is the one that one finds all through the literature]
This is [the cat that caught [the rat that stole [the cheese]]]
[This is the cat] [that caught the rat] [that stole the cheese]

2. reference to the domain of two sentences: there is no morpho-syntactic node that dominates two sentences. Nespor & Vogel's (1986) explanation here: the semantic relation between the two sentences of the second example is not tight enough.
There's my mothe[r]. I've got to go.
There's my mothe*[r]. I've got two cats.

f. both examples indeed show that phonological domains are non-isomorphic with morpho-syntactic structure. Therefore, goes the argument,
1. the domains to which phonology makes reference must first be **created**: we need a parallel domain structure in phonology, **the buffer**, and its construction worker, the **mapping rules**.
2. the input to mapping rules is certainly morpho-syntactic structure, but not only: mapping rules take sovereign decisions how to build phonological domains that do not rely on the morpho-syntactic input.
==> this is what I call the **Black Box**.

(6) non-isomorphism evaporates when boundaries are used
a. both examples above (and all others) have a straightforward explanation when boundaries are used instead of domains:
1. every CP starts a new intonational unit.
2. semantics distribute boundaries that allow or block the linking of r.
b. hence if phonological rules make reference to boundaries rather than to domains, there is no argument at all.
c. in this case all the prosodic constituency and the mapping mechanism are redundant.

(7) so do we make direct reference to syntax? - No !
a. we still need a translator's office: non-isomorphism is a bad argument, but there are good arguments:
1. modularity
the modular postulate disables different modules to see what is going on in each other. Selkirk (1984) uses this argument:

> "The syntax and the phonology are entirely autonomous components, the rules of syntax making no appeal to phonology and vice versa. Mediating between these components, however, are two others that define the relation between the syntactic and phonological representations of a sentence. The principles of these components have a mixed vocabulary." (Selkirk 1984:410f)

2. phonology and syntax do not speak the same language
   [closely related to modularity]
   - as far as I can see, this argument is entirely absent from the PP literature. It has been extensively used by Jackendoff (1992,1994,1997,2002) and Starke (who is not good friends with ink).
   - number, person, verbs, nouns, quantification, aspect and so forth are categories that are understood and processed in syntax as well as in morphology and semantics. Phonology does not even know what quantification etc. is. On the other hand, the higher modules do not know what occlusion, palatality or an Onset is.
   - this is what Jackendoff calls Representational Modularity

> "The overall idea is that the mind/ brain encodes information in some finite number of distinct representational formats or 'languages of the mind.' Each of these 'languages' is a formal system with its own proprietary set of primitives and principles of combination, so that it defines an infinite set of expressions along familiar generative lines. For each of these formats, there is a module of mind/ brain responsible for it. For example, phonological structure and syntactic structure are distinct representational formats, with distinct and only partly commensurate primitives and principles of combination. Representational Modularity therefore posits that the architecture of the mind/ brain devotes separate modules to these two encodings. Each of these modules is domain specific.
> […] The generative grammar for each 'language of the mind,' then, is a formal description of the repertoire of structures available to the corresponding representational module." Jackendoff (1997:41)

> "'Mixed' representation[s] should be impossible. Rather, phonological, syntactic and conceptual representations should be strictly segregated, but coordinated through correspondence rules that constitute the interfaces." Jackendoff (1997:87ss)

b. hence we do need a translator's office.
c. but we do not need any buffer
   [recall that the only argument for the buffer was non-isomorphism]
   actually we must not have any buffer: it would be redundant.
d. goal
   1. we need to eliminate the buffer
   2. hence to have a **direct** interface: one whose output is not any freshly created structure, but a true phonological object that is known in the phonological world independently of any issue related to inter-modular communication.
   3. hence the output of the translator's office must be true phonological objects.

II. What the Interface looks like and what it can (not) do

(8) general picture
   a. in absence of higher level intervention, phonology is subjected only to its own law. This situation is met
      1. morpheme-internally
         locality: higher levels have bearing only on objects that are adjacent to the boundary at hand. This is an obvious observational fact: nobody has ever seen any morpho-syntactic influence in the middle of a morpheme.
      2. at morpheme edges if higher levels do not send any postcard, i.e. decide not to intervene.

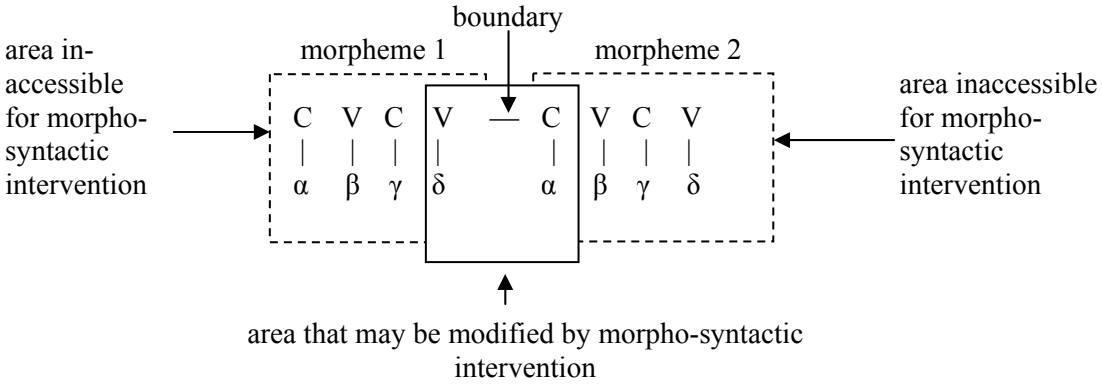
b. at morpheme edges (and only here), phonological law may be forced to cohabitate with alien law, i.e. whose origin are other modules. If higher levels decide to intervene, their law outranks the domestic phonological law.

c. another obvious restriction: higher levels do not have bearing on melodic units, i.e. on anything that is going on below the skeleton. Processes whereby a velar gets palatalised by the morpheme boundary X are unheard of. In these cases everybody supposes that the morpheme in question is a floating palatal agent.
Hence higher levels may alter the course of an existing phonological process, but do not create new processes.

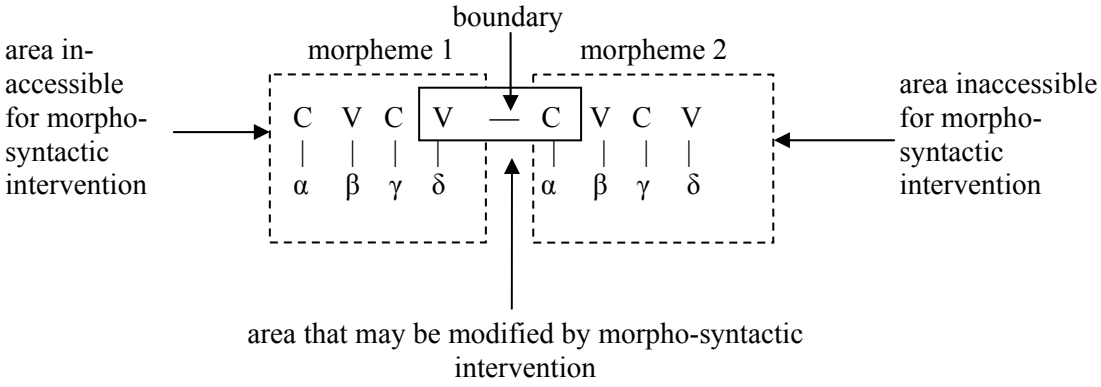
d. Privativity:
hence **nothing** happens, **nothing** is shipped off from higher levels and the interface **does not work** at all in case phonology follows its purely domestic rule: morphemes are concatenated, and phonology is done.
It is an empirical fact that phonology is heavily underfed with higher level information, of which only a vanishingly small subset has any effect in phonology. Privativity is an important question that runs through the interface literature since the 50s (but there is no time here to go into this).

1. proponents of privativity (you project into phonology only what changes the course of phonology):
Chomsky et al. (1956).
2. proponents of non-privativity (you project everything into phonology no matter whether it has any effect):
- SPE: put everything into the phonology and erase it when phonology is done.
- Prosodic Phonology: to a lesser extent; the prosodic constituency replicates most, but not all of the morpho-syntactic tree, whether or not it has any effect in phonology. Paradoxically proponents of PP have used the privativity argument against the direct syntax approach (e.g. Bickmore 1990, Inkelas & Zec 1990:xv).

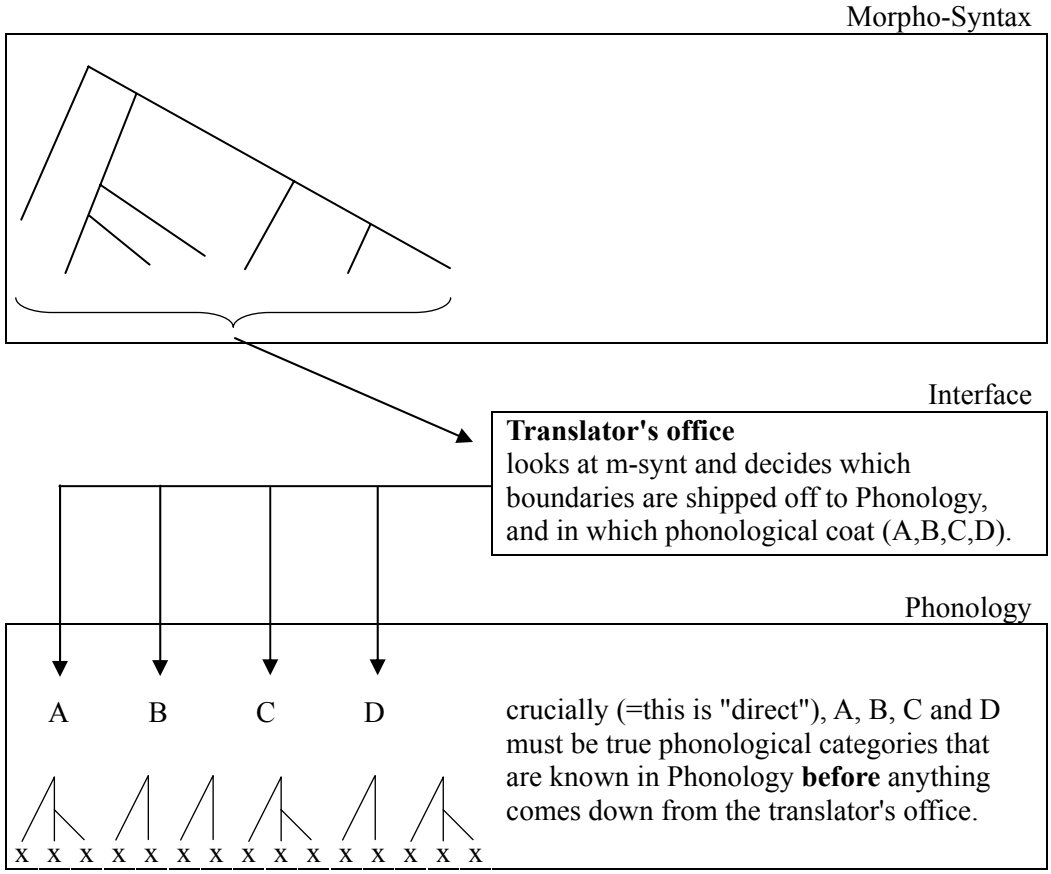
(9) locality: areas not adjacent to the boundary cannot be accessed by higher levels.



(10) locality and melodic restriction: areas not adjacent to the boundary cannot be accessed by higher levels, nor can melody.



(11) Direct Interface: general architecture



(12) the translator's office and its outlet

a. strict modularity: morpho-syntax does not know that phonology exists, phonology does not know that syntax exists. Only the translator's office knows about the general picture. All decisions are taken in the translator's office:
   1. which morpho-syntactic boundaries are shipped off to phonology
   2. how they are grouped
   3. in which specific phonological coat (A-D) they are sent down.

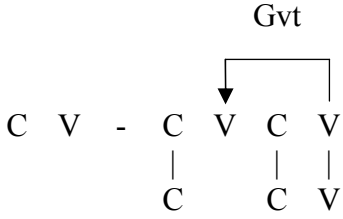
b. the outlet of the translator's office (A-D) are true phonological objects that exist in phonology before any higher action is performed, i.e. independently of the interface purpose. They are therefore theory-specific: every theory has its own vocabulary.

c. different phonological theories make different predictions as to what can be A-D, hence this has potentially an empirical content and may be used in order to run these theories against reality, i.e. to evaluate them.
PP can work with any phonological theory: the prosodic constituency will always be the same, and different theories below the PP tree will not make any contrasting predictions.

(13) the DIRECT effect
advantage: true phonological objects make predictions in phonology precisely because phonology reacts on them.

a. diacritics do not make any prediction: "#" could trigger or block any phonological process and its reverse. A CV unit cannot.

b. example
language A: ø → V / #C__C
language B: V → ø / #C__C
are both possible natural languages when using #: the object "#" does not rebel against language B, which of course is non-human. Because "#" does not make any prediction at all, it has no predictable effect on phonology, it could trigger any process and its reverse.
By contrast, # = CV makes a clear prediction:



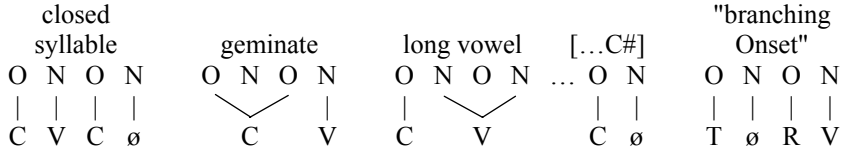
erasing the vowel is impossible because this leads to a situation where the initial V remains orphan: the structure is ill-formed.

c. as admitted by Vogel & Kenesei (1990:344), prosodic constituency and # etc. are both diacritics, only that the former is an autosegmental diacritic: both serve the indirect conception: higher modules send X (prosodic constituency or #), to which phonology makes reference.

d. some things are not possible anymore without the buffer: for example to adjoin extrasyllabic/ extrametrical objects to "some member of the Prosodic Hierarchy" in order to save its pronounciation. But being unable to do this is probably good anyway because unlike for syllabic constituents nobody has ever defined what kind of material, in which order and how many items a prosodic word etc. can accommodate. Hence there could be 3, 7 or 25 extrasyllabic consonants in a row, all attached to some node of the prosodic hierarchy. This is certainly not something a theory should be able to do.

III. Theory-specific part: Direct Interface in Government Phonology

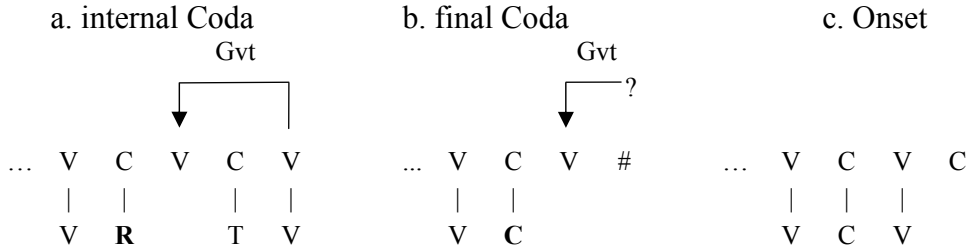
(14) basic phonological categories in Government Phonology (CVCV)
[Lowenstamm 1996,1999, Scheer 1999,2004, Szigetvári 1999, 2001, Szigetvári & Scheer 2005 etc.]



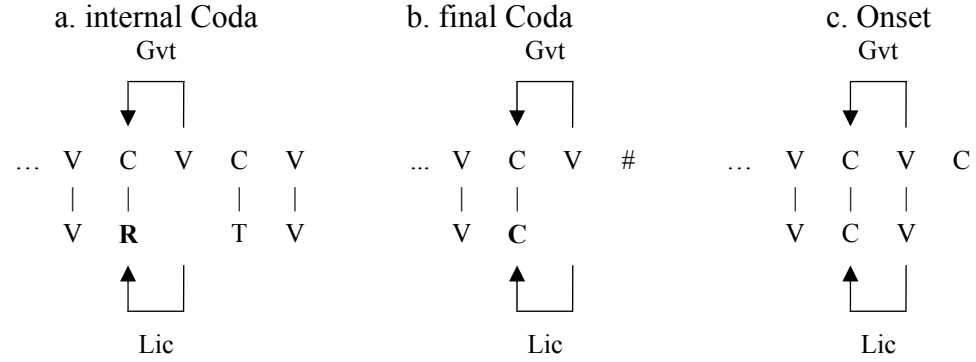
a. Onsets
b. Nuclei
c. Government
d. Licensing
e. all lateral relations are head-final (i.e. regressive)
f. minimal skeletal unit: Onset + Nucleus = CV

(15) basic phonological objects in Government Phonology (CVCV)
Lateralisation of Structure and Causality

a. lateralisation of structure
definition of the Coda: a Coda is a consonant that occurs before a governed empty Nucleus.

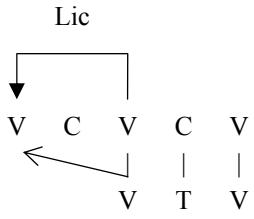


b. lateralisation of causality
the reason for the existence of syllable-related processes are lateral relations.
WHY are Codas weak? Because they are ungoverned and unlicensed (the Coda Mirror, Ségéral & Scheer 2001).
- a Coda is both ungoverned and unlicensed (because the following Nucleus is empty and hence laterally disabled = cannot dispense either Gvt or Lic).
- an Onset is both governed and licensed (because its Nucleus is laterally enabled).



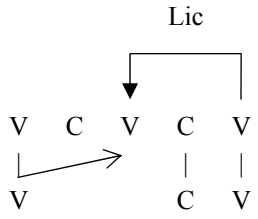
c. long vowel [Scheer 2004:§218]
the complement of long vowels must be licensed

a. non-alternating long vowel: right-headed, i.e. a self-licensor

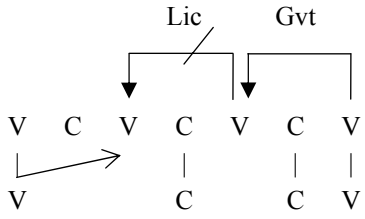


b. alternating long vowel: left-headed, i.e. needs support from the right

in open syllable: complement licensed



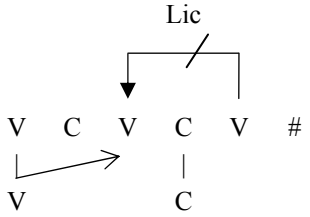
in closed syllable: complement unlicensed



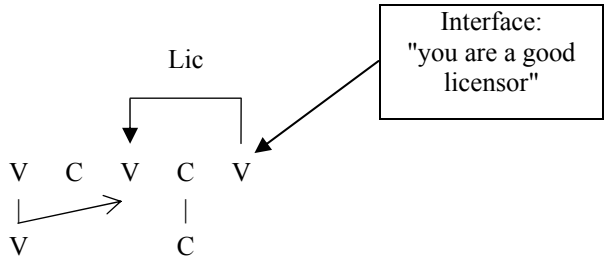
d. closed syllable shortening: two patterns [Scheer 2004:§524]
1. short V both in internal and final closed syllables: Turkish.
2. short V only in internal closed syllables, long VV in final closed syllables: Icelandic.
3. doesn't exist: short V in final closed syllables, long VV in internal closed syllables.

in CVCV, this means that in the Turkish-type language final empty Nuclei cannot license, while they can in the Icelandic-type language.

*VVC# in Turkish: only domestic phonological rule, no higher intervention



VVC# in Icelandic: higher order: "FEN, you are a good licensor"



(16) summary so far: parameters set once for the entire language

a. parameter 1
"final Codas yes/ no" = the language has C# or not. [old problem from Kaye 1990]
domestic phonological rules alone: no = Italian
higher intervention: "FEN, you are governed" = English etc.

b. parameter 2
in closed syllable shortening systems, "VVC# ok / out"
domestic phonological rules alone: out = Turkish
higher intervention: "FEN, you are a good licensor" = Icelandic

c. parameter 3
"RT# ok / out"
domestic phonological rules alone: out = Greek
higher intervention: "FEN, you are a good governor" = English etc.

(17) hence, identity of the outlet of the translator's office: **predictions**
   a. recall that A-D can only be objects above the skeleton: "no melody"
   b. recall that only objects adjacent to the boundary may be manipulated
   c. the properties of CVCV together with these restrictions define exactly four ways how the Interface can influence phonology:
      [the outlets A-D]
      1. influence on the phonological properties of FEN
         - FEN, you are governed
         - FEN, you are a good governor
         - FEN, you are a good licensor
      2. modification of the syllabic space: insertion of a CV unit.

(18) non-events predicted by the properties of CVCV
   a. FEN, you are licensed
      there is no correspondent empirical effect: nothing depends on whether a FEN is licensed or not.
   b. modification of empty Onsets
      syllable structure is a function of lateral relations, and these originate only in Nuclei. Hence Onsets do neither govern nor license, thus nothing could be modified by the Interface.
   c. consequence:
      1. beginning vs. end of morpheme asymmetry
      2. empty Onsets occur only at the beginning of morphemes
      3. empty Nuclei occur only at the end of morphemes
      ==> this is the reason why the host of higher-level-conditioned phenomena occur at the right, not at the left edge of morphemes. 3 out of 4 outlets concern the end of morphemes.

(19) classes of suffixes: level 1 vs. level 2
   example: the English velar nasal
   a. [ŋg] morpheme-internally: finger, hunger etc.
   b. [ŋ] word-finally: sing etc.
   c. /ŋg/ + level 1 suffix → [ŋ]

root	agentive -er	progressive -ing	-able	diminutive -y		adverbial -ly	
-ŋ#	-ŋə	-ŋɪŋ	-ŋabl̩	-ŋ#	-ŋi	-ŋ#	-ŋlɪ
sing	sing-er	sing-ing	sing-able	thing	thing-y	long	long-ly
hang	hang-er	hang-ing	hang-able	string	string-y	strong	strong-ly
bring	bring-er	bring-ing	bring-able				
bang	bang-er	bang-ing	bang-able				
long	long-er	long-ing	long-able				

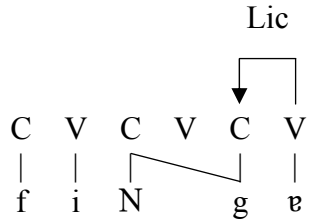
   d. /ŋg/ + level 2 suffix → [ŋg]

comparative -er	
-ŋ#	-ŋgə
long	long-er
strong	strong-er
young	young-er

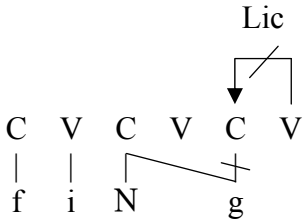
(20) analysis
- a. homorganic NC sequences, i.e. [ŋg], are "nasal geminates": a geminate g whose lefthand position also accommodates a nasal prime (e.g. Harris 1994:69,174s)
- b. /g/ of /ŋg/ can only be realised if it is licensed.
- c. consequence: FEN cannot license in English
  ==> good prediction: final consonants are real Codas (e.g. not extrasyllabic), they pattern with internal Codas. For example dark l: holding [ɬ], Bill [ɬ] - Billy [l].
- d. level 1 suffixes do not carry any Interface order: phonology rules alone.
  level 2 suffixes come with an Interface order: "you FEN preceding the level 2-boundary are a good licensor".

(21) illustration

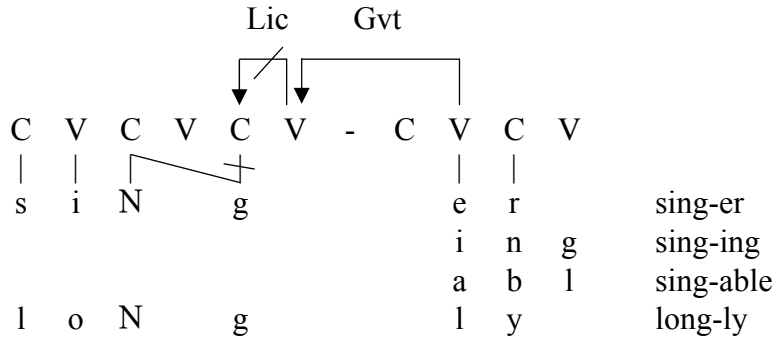
a. finger



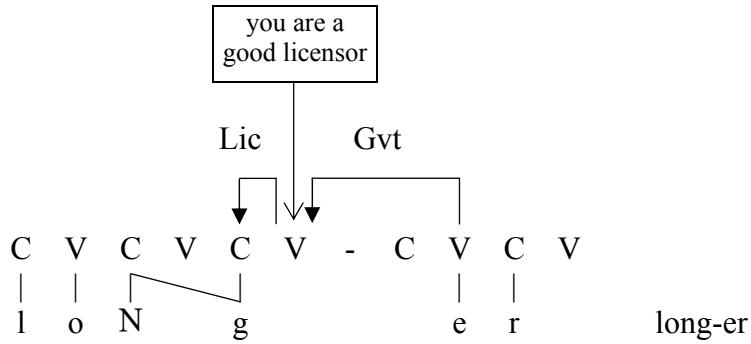
b. sing



c. level 1 suffix



d. level 2 suffix



(22) conclusion
- a. we need a translator's office: modularity, different languages.
- b. we need an interface without any buffer.
- c. we need a DIRECT Interface: its output must be true phonological objects.

d. the actual identity of the output is theory-dependent: different theories have different vocabulary, hence allow the output to be make different objects that have make different predictions in the phonology. This is an instrument for comparing the merits of different phonological theories: unlike in PP where the Interface was theory-neutral, you will have to talk about phonological theory before you can address the interface.
e. domains - boundaries
   1. for all segmental purposes, boundaries are the relevant currency, not domains.
   2. for suprasegmental effects such as stress and intonation, local boundaries do not work, domains are the relevant currency. Reason: suprasegmentals, as indicated by the word, are not local but wander around, hence local boundaries won't do. Example: parent - parent-al vs. párent-hood.
f. serialism
   1. there is no serialism in the segmental world: the Interface ships off either nothing at all or an order, and all at once. At the segmental level, this interface theory is a representational alternative to the usual Lexical Phonology derivationalism. Its impact on opacity needs to be tested.
   2. there is still derivationalism in the suprasegmental world, i.e. where phenomena are not local.
      Here Kaye's (1995) position has become mainstream, also in OT:
      phonology itself is not derivational, but its relation with other modules is: intertwining of word-construction and the application of phonology, as proposed by Lexical Phonology.
      Rubach (1997) has introduced this idea into OT ("there are levels between which we rerank constraints, but within a level there is no serialism") (Derivational OT), Kiparsky (2000) has taken it over (Stratal OT), and even McCarthy now accepts derivationalism (but not one of Lexical Phonology-Rubach-Kiparsky).
      This is also parallel to the general architecture of syntax: syntax itself is not derivational, but its relations with other modules are.
      Representational concurrent "from above": Distributed Morphology where level 1 and level 2 affixes sit in two areas of the tree that are separated by a Phase.
   3. I don't really know what to do with that, of course it would be nice to get rid of derivationalism altogether. But the non-local nature of suprasegmental phenomena leaves little hope for having a local solution using boundaries.
g. why there is no recursion in phonology
   the absence of recursion in phonology is a well-known empirical fact. Hence phonological theory must be unable to produce recursion. What is recursion? Recursion is the result of an arboreal structure whereby an object dominates an object of the same kind. Hence in an environment where there is no arboreal structure, there could not possibly be any recursion. In short, "no trees, hence no recursion without Merge".
   1. an effect (not a goal !) of Government Phonology in general and of CVCV in particular is the lateralisation of syllable structure, i.e. the replacement of syllabic trees by a flat structure.
   2. Szigetvári & Scheer (2005) argue that it is advantageous to treat stress in a flat environment.
   3. now the buffer = the prosodic tree goes.

   ==> there are no trees left in phonology (above the skeleton). Hence there could be no recursion.

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