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Against word-final empty nuclei

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In this poster* I argue against the existence of word-final empty nuclei. First, I describe the motivations that lead to the assumption of this category in phonological theory, especially in Government Phonology. Then I mention theoretical and empirical arguments within GP that challenge the claim that phonological domains end in either a pronounced or an unpronounced empty nucleus. In the second part of this writing, the existence of codas is threatened, paving the way for a very simple phonological skeleton, which contains strictly alternating consonantal and vocalic positions. Next, I show why assuming word-final empty vocalic positions runs into difficulties in such a framework. Finally, I make an attempt to indicate a way out of the maze.

The apparently self-evident hypothesis that superficial adjacency is evidence of adjacency at all levels makes life easy on the one hand, and very difficult on the other. Syntacticians have long noticed this fact, for phonologists it still is not always obvious. Accepting the—let's call it—adjacency hypothesis makes it trivial to determine syllable structure simply by looking at the string of segments constituting the word. The price to pay is the unbelievable complexity and number that syllable types will exhibit. If we are not willing to pay this price, we have to allow some degree of abstraction, dispensing with the view that adjacent segments are necessarily adjacent underlyingly. In this way, syllable structure can be radically simplified.

Empty positions on the skeleton

One of the first steps in this direction is taken by early Government Phonology (GP). The central claim is that skeletal positions interact and the presence and direction of this interaction, called government, is a function of the melodic content of the positions involved.[1] When such interaction is impossible between two superficially neighbouring positions the theory posits latent positions between them, which fail to surface but block government. Empty skeletal positions, however, are not free to occur just anywhere, they also have to satisfy strict conditions. This way the theory can make predictions of what surface segment sequences are possible and what is impossible in a given phonological system.

Although a theory containing noninterpreted skeletal positions departs from the null hypothesis,[2] this sacrifice is sufficiently rewarded by a number of advantages that make it

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* The previous version was commented on by Péter Dienes and Miklós Törkenczy.

[1] Actually, the amount of melodic content licensed depends on the governing relations. For the discussion here, the cause-effect relationship is immaterial.

[2] The null hypothesis is, in fact, very difficult to collar. One may say that the presence of empty positions in a representation must only be assumed if the theory cannot cope with certain phenomena otherwise. While this is true, one may equally argue—especially if first acquainted with languages that have no consonant and vowel clusters and words can only begin with a consonant and end with a vowel—that the simplest skeleton is one that contains only strictly alternating consonantal and vocalic positions, more complicated structures are to be assumed only if this turns out to be insufficient. If left unnoticed, this contradiction may easily pave the way towards theoretical dogmatism.

superior to theories that abide by the adjacency hypothesis. For example, morphological and phonological alternations, like *take* ∼ *taking, separate* ∼ *sepa/rate,* would force us to introduce resyllabification: the coda k of *take* becomes an onset in *taking* and the onset p of the unsyncopated sepərət becomes a coda in the bisyllabic seprət. Resyllabification subverts the result of core syllabification, thereby representing a serious challange to phonological parsing. One could argue that resyllabification is necessary because a word-final or preconsonantal consonant behaves differently from its prevocalic alternant. This, of course, is true, but one must also admit that resyllabification is simply a way of representing this fact, nothing that would offer any explanation. In such a framework we know a consonant is in coda position because it behaves like consonants in coda position usually do. Since *being* in coda position is not an empirical issue, we have no independent evidence for the codahood of a consonant apart from the fact that it behaves like other consonants that we believe to be in the coda.

What is more, in many respects word-final consonants pattern like onsets. The different behaviour of word-final consonants and codas has long been noticed and attempts at explanations abound: extraprosodicity (Itô 1986) and coda licensing (Kaye 1990) are two prominent examples. The greatest difficulty with having extraprosodicity distinguish word-final consonants from word-internal codas is that this way we increase the number of syllabic constituents. If extrasyllabic consonants are later subsumed under the coda node of the last syllable in one case and under the onset of the following syllable in another, then we are back at resyllabification only with some complication in the meantime.

Coda licensing and the ECP

Coda licensing distinguishes the two types of consonantal positions by claiming that codas cannot occur word-finally because they always need to be licensed by a following onset. Consequently, codas cannot occur word-finally where they would not be followed by a further consonantal position. If not coda then a word-final consonant might occupy an onset. The uneasiness of traditional syllable theories with this hypothesis stems from the assumption that the presence of an onset implies the presence of (at least) a nucleus as well. Intriguingly, this is the view of standard GP too, the principle of onset licensing requires that all onsets be followed by a nucleus. The necessity of this is not obvious: GP denies the theoretical status of the syllable, it claims that onsets and rhymes do not together constitute a constituent that could be labelled the syllable. Therefore it is not clear why it could not be the preceding nucleus — or its projection, the rhyme — that functions as the licensor of an onset, if it needs to be licensed.

In theories that do not allow skeletal positions to remain unpronounced the option of word-final onsets licensed by a following nucleus is invalidated straight away. GP on the other hand does recognize empty categories and provides a phonological Empty Category Principle to constrain their occurrence. The various formulations of the principle usually claim the following:

A category remains uninterpreted phonetically if

(i) properly governed or

(ii) domain-final (in certain languages) or, as some versions add,

(iii) trapped in an interonset domain.

Though worded in a categorially neutral way, the ECP constrains the interpretation of nuclei only, since only nuclei may be word-final and only they may be trapped in an

interonset domain. The somewhat vague definition of proper government, which claims that the proper governor and the proper governee must be adjacent on the relevant projection, is also tailored exclusively for nuclei to properly govern other nuclei. Since the "relevant" projection must be one where only nuclei but not onsets project lest the nuclei should be separated and not be adjacent, a nucleus will never properly govern an onset.

The existence of interonset domains is a weird idea in versions of the theory that also allow codas (branching rhymes) and branching onsets. It will be very difficult to tell with so many options for a consonant cluster which one to choose in a particular case. I believe interonset domains make sense only in the most restrictive framework, CV theory.

The most serious problem with the ECP as given here is that even if we disregard interonset domains, there are two reasons for an empty nuclear position to remain uninterpreted phonetically. Furthermore, these reasons are very different in nature and, in addition, one of them is a language specific parameter, while the other is probably part of UG. It is very strange anyway to say that an empty skeletal position can remain silent because a parameter lets it so. This idea is comparable to the magic power that licenses certain configurations in the environment of strident coronal fricatives, and can at best be taken to be a temporary solution.

Besides the theoretical difficulty that arises with positing word-final empty nuclei there also exist empirical counterarguments. GP claims that for certain consonant clusters to exist one of the consonants must govern the other. This is typically the stronger one, that is, the second in coda-onset clusters like rt or rʒ and the first in branching onsets like tr or gl. In order to be capable of governing its dependent a consonant needs license to govern, which it gets from the following nucleus (Charette 1992). In some languages the government licensing properties of word-final empty nuclei differ from those of word-internal empty nuclei. For example, coda-onset and branching onset clusters are attested word-finally in Standard French: *quarte* kart 'fourth', *quatre* katr 'four', in case such clusters would find themselves before a word-medial empty nucleus that nucleus is pronounced even if it could be properly governed: *forgeron* fɔrʒərɔ̃, *-rʒr- 'blacksmith', *beuglement* bøgləmɑ̃, *-glm- 'bellowing'.

Against codas

Another issue raised by accepting the existence of empty nuclei in the representation is that this step reduces the number of candidates for codahood. Since codas are usually identified as being lenition sites and we now see that onsets that are followed by an empty nucleus also pattern with codas, one of the design features of codahood is lost. In Szigetvári 1999 I try to refute the arguments standardly mentioned in support of the existence of codas. I summarize the results here.

(i) The coda is an outcast in markedness universals: onsets may even be obligatory but are never impossible in languages, codas are never obligatory and may even be impossible.

(ii) In distinguishing heavy and light syllables, there are problems with the coda approach. The conjunction "branching nucleus *or* branching rhyme" is not very elegant, furthermore, we get no explanation of why the onset does not count in syllable weight.

(iii) While closed syllable shortening can be explained by reference to the impossibility of a coda following a branching nucleus, there is an alternative explanation to be discussed below.

(iv) The evidence phonotactic constraints provide is far from being conclusive: there seems to be interaction between nonadjacent consonants as well as those which are claimed to be neighbours (cf. e.g. Lukács 1997). In addition, many languages exhibit C_1C_2 and C_2C_1 clusters alike intervocalically (cf. Kaye & al. 1990 for Nez Perce and Moroccan Arabic, Polgárdi 1998b for Hungarian and Szigetvári 1999 for English).

CV phonology (Lowenstamm 1996)

If the notion of coda is abandoned, while consonants that expect to be hosted by this position remain, they have to be catered for by onsets. This is not surprising, the same thing has happened in GP to word-final consonants and also to those that found themselves before a syncopated vowel's deserted nucleus. This makes the structure of the syllable much simpler, made up only of an onset and a nucleus. I am not going to argue here for the claim that neither of the two remaining syllabic constituents branch, I only assume that the phonological skeleton is made up of alternating consonantal and vocalic positions, represented as C and V. In the representation of consonant clusters there is an empty V position between the two C positions, while in the representation of vowel clusters (long vowels and diphthongs) there is an empty C position.

Heavy vs. light syllables

In a theory comprising only CV pairs to represent syllable structure, a light syllable will be made up of one such pair, while a heavy syllable will contain two of them as shown in (1), where the Greek letters stand for any, potentially identical, melodic material:

(1)

light syllable	*heavy syllable type 1*	*heavy syllable type 2*
C V	C V C V	C V C V
| |	| | |	| | |
α β	α β γ	α β δ

The advantages of the representations in (1) are the following: (i) the formulation of what constitutes a heavy syllable is much less clumsy than if we were using the coda, all that has to be distinguished is one vs. two CV pairs, as opposed to statements like "*either* the nucleus *or* the rhyme is branching." (ii) We get an explanation of why onsets do not contribute to syllable weight: paradoxically rhymes do not contribute either, the question itself loses its significance. All we need for a heavy syllable is two pronounced CV pairs, that is two CV pairs in both of which either the C or the V part is nonempty. The onset of such a syllable is the C of the first pair but whether it is filled or not is immaterial, since its V will be filled, that is why it is taken to be a syllable in the traditional approach. Thus we get an explanation for why "onsets" do not count in syllable weight.

Many languages restrict the minimal size of free phonological forms. The restriction typically takes the form: a minimal word must be either a closed syllable or a syllable with a long vowel. In a framework allowing word-final codas, this could be formulated as the following: a word must contain at least a heavy syllable. To capture the restriction in the traditional GP framework is rather complicated, one has to say that either the nucleus of the only syllable of the minimal word must branch or—since a word-final consonant is

not a coda—the word must contain two onset-rhyme sequences. The CVCV formulation is trivial: the minimal word must contain at least two CV pairs (perhaps in order to be stressable).

Compensatory lengthening

Compensatory lengthening is another phenomenon that appears to call for coda positions in representations. After the total lenition of a consonant in a weak prosodic position the loss is made up for by the propagation of either the preceding vocalic or the following consonantal material, for example, the reconstructed Greek form esmi is realized in Classical Attic as e:mi 'I am', while the Aeolic has em:i. The latter event, where the place of a consonant is taken up by another consonant, is rather easy to handle for both theories. Vowel lengthening on the other hand happens in violation of structure preservation in the coda approach: what used to be a consonantal position, coda, is lost and a vocalic, nuclear position appears instead. The model offered by the CVCV approach does not face such problems: the vacation of the C position by the loss of s either opens the way for the following C position to occupy it (2c) or removes the obstacle that has prevented the preceding V from taking it (2b).

(2) a. Reconstr. esmi b. Attic e:mi c. Aeolic em:i

Closed syllable shortening

Closed syllable shortening is somewhat problematic to explain in a CVCV framework. Recall that empty nuclei at the end of the word were hypothesized by Kaye to distinguish word-medial codas from word-final "codas". If all coda positions are dispensed with, what was traditionally labelled coda becomes a consonantal position followed by an empty vocalic position. Funnily enough, this move brings us back to the state we started out from: the two types of coda positions are again indistinguishable. Both word-final and preconsonantal consonants are in pre-empty-V position, the difference between them is that the former is followed by an empty V that is domain-final, while the latter by one that is not. Lowenstamm's comment that "in Norwegian, a word-final [empty] nucleus enjoys the same licensing privileges as a full vowel" (1996 : 17), cited and claimed to be true of Hungarian too by Polgárdi (1998b : 17), is clearly inadequate, only describing but not explaining the situation. (And there again, we are back to distinguishing the two types of empty nuclei.) More importantly, this claim is false (at least for Hungarian and English): while long vowels occur in _C#, but not in many types of _CC positions, only a limited subset of word-medial consonant clusters is attested word-finally. Thus, though it is true that a long vowel is allowed before a consonant followed by a word-final, but not before one followed by a word-medial empty nucleus, i.e., the word-final one patterns like a full vowel, full vowels can license consonant clusters which word-final empty nuclei cannot.

It is worth noting that the constraint *V̄CC does have exceptions. On the one hand, there is a class of exceptions in both Hungarian and English that call for a separate analysis. In the first language the low vowels behave peculiarly: a: and e: occur freely

before consonant clusters.[3] In English long vowels occur quite unrestrictedly before word-final coronal consonant clusters. I have no account for these phenomena. On the other hand, both languages have long vowels before consonant clusters that do not occur word-finally.

This points to another weakness of CV phonology as presented by Lowenstamm (1996) and Scheer (1996, 1998), namely it fails to distinguish between the traditional coda-onset and bogus clusters. The theory pretends that both types are bogus. Empirical facts refute this assumption: coda-onset clusters occur word-finally, bogus clusters do not. In addition, as we have seen, long vowels are banned from occurring before coda-onset clusters (except for the special configurations mentioned but not treated here), while we do find long vowels before bogus clusters, e.g. Hungarian *bóvli* 'shoddy' or English *favourite* feɪvrɪt.[4]

The way out

Word-final empty nuclei do not govern, hence the impossibility of word-final bogus clusters: the empty nucleus sandwiched between them is not properly governed, it is not domain-final and it is not enclosed in an interonset domain (cf. the ECP). In a CV framework their only function would be to "license their onset", the preceding consonantal position. This function is a relic of the Phonological Licensing Principle (e.g. Itô 1986), which requires that all positions of the phonological skeleton be licensed and of the view that phonological strings are made up of syllables, therefore an onset is always followed by a nucleus.

In a CV framework, we may dispense with the Phonological Licensing Principle. Since the C-ness or V-ness of a skeletal position is readily predictable by counting the number of slots from the beginning of the domain, it is unnecessary to assume anything else to do this calculation. Cs and Vs come in inseparable units, therefore the presence of one of them implies the presence of the other, there is no need for an extra device to license their existence. If we accept this reasoning, the only justification for positing a word-final empty nucleus vanishes. This position is now totally inert, it is as if it were not there, so let us suppose that it *is* not there. What we gain by such a move is that word-final consonants are again different from word-medial preconsonantal consonants inasmuch as the former is not followed by anything in the domain, the latter is followed by an empty nucleus. We can also discard the spurious second clause of the ECP: domain-final nuclei do not have to be taken care of, they simply do not exist.

The difference of coda-onset and bogus clusters still needs formalization. In Dienes & Szigetvári 1999, we propose that this should be done by C-to-C government, that is, if the melodic content of two consonants separated by an empty V slot is apt, the second may govern the first. This being an interonset domain satisfies the ECP for the intervening V slot, it may remain empty without being properly governed. Coda-onset clusters are therefore possible word-finally: the intervening empty V position does not need government to remain silent (3a). Bogus clusters on the other hand are only possible if followed

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[3] This is what Polgárdi (1998b) sets out to explain.

[4] In English trisyllabic shortening conspires against most potential examples. For a bogus cluster we typically need two weak nuclei of which the second properly governs the first, which accordingly syncopates. The long vowel before this configuration is unfortunately in the third syllable from the end, thus short in most cases.

by a pronounced vowel, which governs the V position between the two consonants. This is not the case word-finally, hence the ungrammaticality of (3b). (Government is marked by a little lightning striking the governee: $\overset{\lightning}{\text{v}}$V is thus proper government, C$\overset{\lightning}{\text{v}}$C represents C-to-C government. Empty skeletal positions are marked with lowercase letters, the offending slice of the skeleton is asterisked.)

(3) a. V C$\overset{\lightning}{\text{v}}$C b. V C *v C
a r t a t n

It is also suggested that a consonant governed by a consonant cannot govern any further, just like a governed vowel cannot govern. This is needed to explain why the first two consonants of a three-member consonant cluster is typically a coda-onset cluster, and the second two a bogus cluster, e.g. artna (4a), while a coda-onset cluster combined with another coda-onset cluster is impossible, e.g. *arnta (4b).

(4) a. V C$\overset{\lightning}{\text{v}}$C v C←V b. V C *v C$\overset{\lightning}{\text{v}}$C V
a r t n a a r n t a

On a CV skeleton a long vowel or a diphthong is represented as two V slots separated by a C slot devoid of melodic material. By assuming that this empty C slot must be governed in order to distinguish a long vowel from hiatus, we arrive at the explanation of closed syllable shortening: a governed C (a coda, for those who haven't followed) cannot govern the C slot within the long vowel: *a:nt (5).

(5) V *c v C$\overset{\lightning}{\text{v}}$C
a n t

Sceptics may ask why it is the default option for phonological domains to end in a vowel if the skeleton may end in either a C or a V position. The claim made in Dienes & Szigetvári 1999 is that all phonological domains in all languages end in a C position,[5] and when words end in a vowel that is because this C position is empty. Keeping an empty C position silent is much less an effort than doing so with an empty V position, in fact, C positions prefer to stay unpronounced. Therefore a word-final C position remains silent in the unmarked case.

So...

I hope to have shown that there is little need for word-final empty nuclei in phonological theory. All the phenomena presented in this paper could be analysed with a CV framework lacking the final empty V position. Further work is needed to find the unsurpassable difficulties that will invalidate this theory.

Let me again repeat the main points of this poster:

[5] Polgárdi 1998a:35ff also entertains the idea of getting rid of word-final nuclei. She, nevertheless, proposes that this be a constraint that some languages rank above, others below other constraints, thus having some V-final and some C-final skeletons.

(i) Together with GP, I argue that hypothesizing empty skeletal positions has far more advantages than excluding them from analyses.

(ii) I indicate some weak points of the phonological Empty Category Principle of GP.

(iii) Together with CV phonology, I argue against the existence of the coda position on the phonological skeleton showing that most phenomena coda-analyses can explain are accounted for even better by a strict CV framework.

(iv) I show why CV phonology fails to properly explain closed syllable shortening, and offer a working analysis couched in a partly modified framework.

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