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0. Introduction*

In this paper we examine whether complex constituents have to be recognised at the edges of syllables in Hungarian, i.e. whether it is necessary to refer to complex onsets and/or codas in order to account for Hungarian syllable structure-related phonological phenomena. As the main thrust of the paper is analytical rather than theoretical, i.e. its main purpose is to identify phenomena that have to be accounted for by everyone of any theoretical position who analyses Hungarian phonotactics or syllable structure, we will take a very permissive stance initially, and assume that in principle branching onset and coda constituents *are* possible.[1] Given this assumption, it is interesting to ask whether a given language allows these branching constituents or not, since languages can and do differ in the setting of the complexity parameter (cf. Blevins 1995).

Notice however, that the mere existence of consonant clusters at the beginning or end of words is best not to be taken as surefire proof that complex onsets/codas exist in the language examined. Most current research does not accept the assumption that all members of all consonant clusters at the edges of domains necessarily belong to a single (complex) syllable constituent (cf. for instance Kaye, Lowenstamm & Vergnaud (1990), Harris (1994), Steriade (1982), Rubach & Booij (1990), Davis (1990), etc.) The differences in behaviour of different consonant clusters at the edges of morphological domains that are attributed to differences in their syllabic constituency are usually referred to as "edge effects" and are analysed in various ways.

Usually, the argument follows this pattern: there is a phonological phenomenon PP which is assumed to be related to syllable structure. The consonant clusters $C_\alpha C_\beta$ and $C_\gamma C_\delta$ occur at the edge of a morphological domain M but only $C_\alpha C_\beta$ displays PP. $C_\alpha C_\beta$ and $C_\gamma C_\delta$ are analysed as different in terms of syllabic constituency and PP is taken to be sensitive to this difference. Typical phenomena that have been analysed in this way include Ancient Greek

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[1]Although in many — perhaps most — theories recognising the syllable (or its equivalent of some kind) this is not a *risqué* assumption (Blevins (1995)), we are well aware of the fact that there are frameworks that reject it, cf. for instance the lack of a branching coda (in fact, a coda *constituent* of any complexity) in Government Phonology (henceforward GP); see, e.g. Kaye, Lowenstamm & Vergnaud (1990), Harris (1994).

and Sanskrit reduplication (Steriade (1982)), the distribution of the masculine definite articles *il/lo* in Italian (Davis (1990), Kaye (1992)), Portuguese vowel nasalisation (Kaye (1992)), final devoicing in Polish (Rubach & Booij (1990)), the distribution of consonants in word-initial clusters in Polish (Rubach & Booij (1990), Cyran & Gussmann (1996)), English word-initial and word-final clusters (Fudge (1969), Giegerich (1992), Borowsky (1989)), Hungarian word-initial and word-final clusters (Törkenczy (1994)), etc.[2] The actual constituency asymmetries between $C_\alpha C_\beta$ clusters ("normal" clusters with respect to PP) and $C_\gamma C_\delta$ clusters ("special"[3] clusters with respect to PP) vary from analysis to analysis. Perhaps it is useful to review some solutions that have been proposed. For the sake of simplicity all the illustrations show the left edge of domains (the onset side as it were) — naturally, the mirror image of a given analysis is always possible at the right edge (the coda side), too. To simplify matters further, we concentrate on analyses that make use of hierarchical syllable structure and X positions; however, it is not difficult to extend most of the analyses to flat syllable structure (cf. Kahn (1976), Clements & Keyser (1982)) or moraic syllable structure (cf. Hyman (1985) and Hayes (1989)). Let us assume that the consonant cluster in question (C1C2) is word-initial (#C1C2). As is usual, triangles abbreviate a structure of any complexity.

Figure (1) shows an analysis where the consonants making up the "normal" cluster form a branching onset (1a) while the first consonant of the "special" cluster (the consonant on the edge of the domain) is outside the onset and is directly attached to the syllable node (1b):

(1)

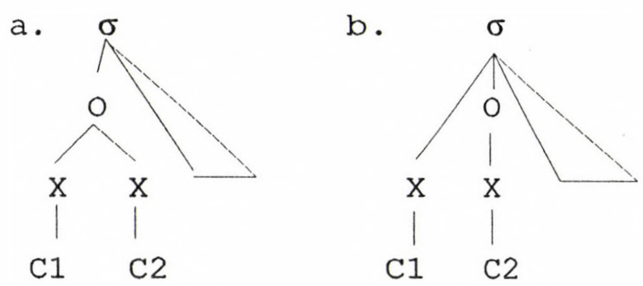

Figure (2) shows two variations of the same kind of analysis. In both cases the "normal" cluster would have the same representation as in (1a). The "special" clusters, however, are analysed differently. In (2a) the first consonant of the cluster is outside the onset, but it is not directly attached to the syllable node (as in (1b)), but has its own node A (usually called appendix in such analyses). (2b) is exactly like (1b) except that the consonant

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[2]Many other languages are said to display such edge effects. For some other examples cf. Blevins (1995) (only the languages are identified, the phenomena are not).

[3]Note that the terms "special" and "normal" are just convenient labels and are not meant to imply any markedness relationship between the two kinds of clusters. Specifically, we think it is possible for a language to have (a) only "normal" clusters, (b) "normal" clusters and "special" clusters, or (c) only "special" clusters.

outside the onset is also outside the syllable and is directly attached to a node Px higher in the prosodic hierarchy than the syllable (such as the prosodic word for instance):

(2)

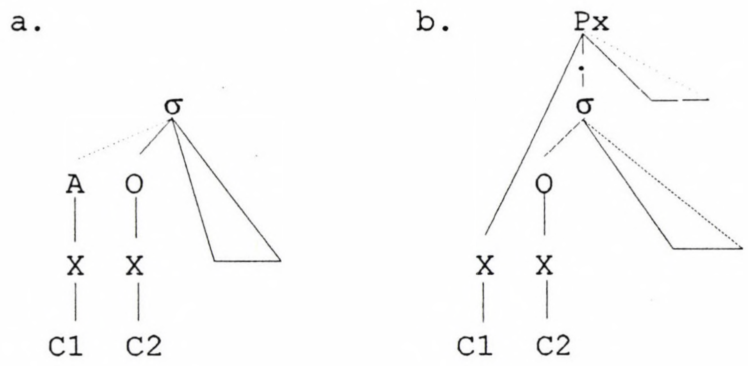

Figure (3) shows an analysis in which there is no difference in constituency between normal clusters and special clusters *at the end of the derivation.* They both look like (3b). *Initially*, however, there is a difference: the first consonant of special clusters is not affiliated to the syllable (or any other node) (3a). It is only attached to the syllable node at some later point in the derivation by some rule (3c), which makes the constituency of a special cluster indistinguishable from a normal one. Crucially, in order for the analysis to work, rule (3c) must apply only after the rule that accounts for PP has already applied.

(3)

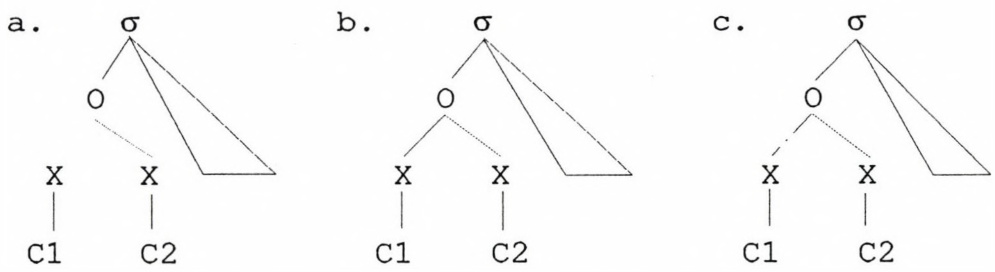

Figure (4) shows possible representations of edge clusters in a theory (GP) which does not allow for special nodes (like an appendix) or the possibility of a consonant being directly associated to a node higher than onset and rhyme.[4] GP, however, does allow empty vowels (empty nuclear positions), which makes it possible to account for edge clusters. (4a) shows the structure of a normal cluster in which the consonants C1 and C2 form a complex onset,

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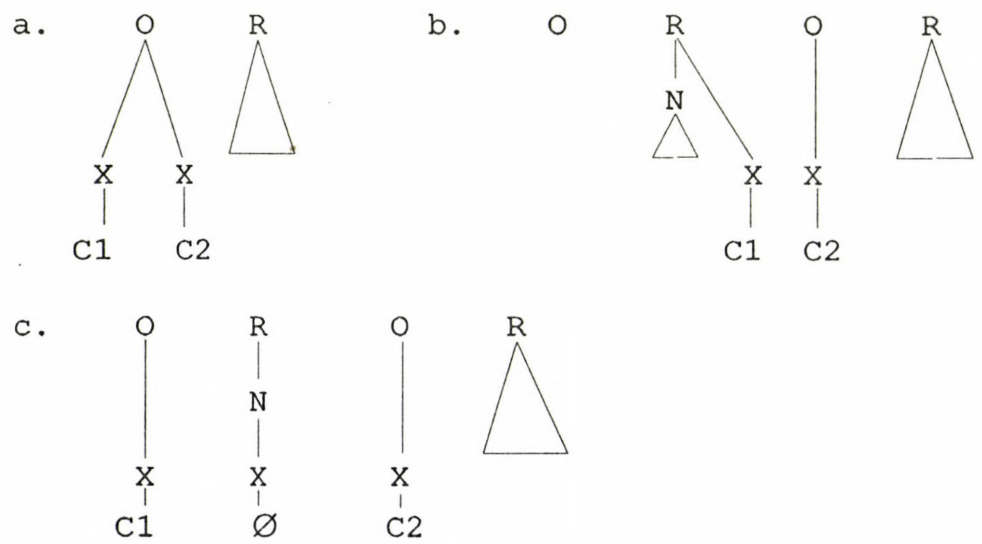
[4]In fact, the theory does not even have a syllable *constituent*, but this is not relevant to the questions being discussed. Informally, an onset - rhyme sequence is equivalent to a syllable.

and (4b) and (4c) show the two possible structures available for special clusters in GP.[5] Notice that in this theory the only way to represent a special cluster is to assign its consonants to different "syllables" (i.e. O - R doublets). In (4b) the two consonants form an interconstituent cluster (a cluster of two strictly adjacent consonants belonging to two different constituents): C1 is the final consonant of a rhyme which is followed by an onset whose initial consonant is C2. If the cluster C1C2 is word initial, the nucleus of the first rhyme is empty (i.e. filled with an empty vowel). In (4c) the two consonants making up the special cluster are separated by an empty vowel, i.e. C1 and C2 are surface-adjacent, but are not strictly adjacent underlyingly.[6]

(4)



Finally, figure (5) shows an analysis in which the representation of normal clusters is identical with the one in figure (1a), i.e. C1 and C2 form a complex onset, but in a special cluster, the first consonant is not attached to any node, i.e. it is not part of any constituent. This analysis is different from the one in (3) in that in this analysis the prosodic licensing of a segment is not required in order for it to be pronounced (or, equivalently, to escape stray erasure), whereas in the analysis shown in (3) it is assumed that all segments must be prosodically licensed *at the end of the derivation.*

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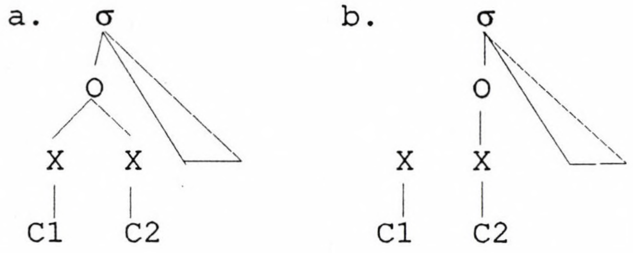
[5]On possible ways of licensing special clusters in GP, see Cyran and Gussmann (1996).

[6]In GP there are strict conditions (partly independent of edge effects) under which an underlyingly empty vowel may be phonetically unrealised (cf Kaye, Lowenstamm & Vergnaud (1990)).

(5)



To the best of our knowledge these are the types of representations of edge clusters currently available on the phonological market. There are minor variations[7] on, or translations[8] of these analyses, but these are the basic ideas.

In this section our main intention was to point out and illustrate that at the edges of domains there is more than one way of analysing clusters in terms of constituency, and not to choose between the analyses that have been proposed. Indeed, the main thrust of this paper is to show that (at least certain) Hungarian consonant clusters at word edges are not onsets and codas, but can be analysed as edge phenomena. Nevertheless, at this point some brief comments on the different analyses are in order. First of all, some of the representations above are in conflict with some widely held general principles constraining phonological structure.

(2b) is in violation of the Strict Layer Hypothesis (cf. Nespor & Vogel (1986), for instance). It also has the additional disadvantage that, if we allow some segments to be directly licensed by prosodic constituents higher than the syllable while some segments are licensed by the syllable node (or one of its subconstituents), there is an uncomfortably high number of analyses available. It is in principle possible that in the same language there is a "normal" domain-initial consonant cluster all of whose consonants belong to the onset, say, and there is more than one type of "special" cluster: in one type the consonant at the edge of the domain is licensed by the foot, in another it is licensed by the phonological word, in yet another the licenser is the phonological phrase, and so on — we could have as many types of special clusters within the same language as many prosodic constituents we have. There does not seem to be evidence for this wide variety of special clusters either within the same language or across languages. The theory must be more restrictive, allowing just one type of special cluster.

(5b) violates Prosodic Licensing (cf. Itô (1986)), in fact, it is a denial of the principle. This extreme position, which is incompatible with most current research, is not usually held, but in a recent analysis of Bella Coola a somewhat more restricted version of this type of

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[7]For instance, an analysis referring to the extraprosodicity of edge consonants can be seen as a variant of (3).

[8]Into mora theory or flat syllable structure, for instance.

analysis was proposed (Bagemihl (1991)).[9] Notice also that, in principle, analyses (1b), (2b) and (3) are not incompatible treatments of special clusters in most incarnations of current "mainstream" syllable structure theory.[10] Thus, we are again facing the familiar problem of (insufficient) restrictiveness: we could have all these different types of special clusters *within the same language* and *across languages*, and as pointed out above, this much variation is not needed. Flat syllable structure and moraic syllable structure would exclude analysis (1b), but (3) and the different versions of (2b) would all be available in these theories as well. A theory (such as GP) in which syllable structure is "uniform" in the sense that all clusters are analysed into (a combination of) the same very limited set of syllabic constituents fares much better as far as restrictiveness is concerned. Finally, it must be pointed out that arguments for/against given structures differing in constituency are strongest if couched in a non-derivational framework. The reason is that if derivation is allowed and only two types of clusters (normal vs. special) need to be distinguished,[11] then the difference in constituency between the two types can be translated into an analysis like (3) in which the difference is derivational rather than configurational since at the end of the derivation the two structures are indistinguishable.

All this favours a framework like GP, which is non-derivational and has uniform syllable structure. Nevertheless, in what follows our main aim is not to decide what structure special clusters have, but to see if the clusters or some of the clusters that occur at the edges of words in Hungarian do or do not form complex onsets/codas, or — to put it in another way — whether it is necessary to assume that there are complex subsyllabic constituents other than the nucleus and the rhyme in the language. In most cases, if we find that a given domain-edge adjacent cluster does not behave like a branching onset/coda (i.e. it is "special", to use the impressionistic term introduced above), we will refrain from actually proposing a structure for it and will just label it "edge cluster". Nevertheless, we will sketch (if not propose) possible analyses, but throughout, our main intention is to identify the problems.

1. Complex onsets/left edge

It is a well-known fact about Hungarian that there was a time in the history of the language when complex onsets were not permitted as is shown by the repair of loans such as Latin *schola* > *iskola,* Slavic *brazda* > *barázda*, German *prez* > *perec*, etc.[12] In contrast to this state

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[9]Bagemihl proposes that some consonants in Bella Coola are licensed by mora nodes *that are not licensed by higher prosodic structure.*

[10]Optimality Theory (Prince & Smolensky (1993)) as a non-derivational theory would not allow analysis (3), which crucially depends on derivation.

[11]Which is the case in all the analyses we know. (Cyran and Gussmann (1996) is a possible exception).

[12]Of course, we do not mean *instant* repair, for details and the dating of this historical repair, cf. Bárczi, Benkő & Berrár (1967).

of affairs, there are plenty of words (all of which are loans) beginning with consonant clusters in present-day Hungarian, but there is no compulsory repair of these clusters by epenthesis or deletion. Figure (6) shows typical examples[13]. The list is fairly exhaustive as far as the clusters are concerned: it gives an example for each cluster attested in a sufficiently large database (about 80,000 words).

(6) #CC words[14]

a. *plakát, prém, tviszt, tréfa, kvarc, klór, krém, blúz, bronz, drukkol, gvárdián, gladiátor, gróf, flóra, frász, fjord,*

b. *szpícs, sztár, sztyepp, szkíta, szcéna, szféra, szvetter, szmog, sznob, szláv, sport, stáb, skorpió, scsí, svéd, smink, snassz, slussz, sróf,*

c. *ptózis, pszichológus, pneumatikus,* [ks]*ilofon, knédli, dzéta, gnóm, cvekedli, ftálsav, vlach, zlotyi, zrí, mnemonika, nganaszán, Hradzsin, ...*

The words in (6) are arranged in three groups: in group (6a) the words begin with "typical" onset-like clusters; in (6b) all the word-initial clusters begin with /s/ or /ʃ/; and finally, (6c) contains words with initial clusters that are "unusual", or "atypical" or "crazy" as onsets (e.g. they violate Sonority Sequencing, contain affricates, etc). Initial clusters like the ones in (6a) are usually analysed as onsets in languages that permit branching onsets, and clusters like those in groups (6bc) are often analysed as edge clusters. As can be seen in (6) Hungarian has examples in all three groups. The question is whether these word-initial clusters are

[13]For the sake of simplicity we concentrate on two-member consonant clusters and onsets that are maximally binary. There are a handful of three-member initial clusters (all of them beginning with /s/ or /ʃ/). The inclusion of these clusters would not change our argument in any way.

[14]Hungarian words in this paper usually appear in spelling. The spelling of Hungarian consonants is fairly transparent. The following chart shows the more unusual (di)graphs and their phonetic values (given in IPA transcription):

Spelling	IPA	Spelling	IPA
ty	c	*sz*	s
gy	ɟ	*s*	ʃ
ny	ɲ	*zs*	ʒ
ly=j	j	*cs*	ʧ
		c	ʦ

The glosses of the Hungarian words occurring in the paper can be found in the Appendix, where the words are listed in alphabetical order. In the text, we use a hyphen to indicate morpheme boundaries *relevant to the discussion.* In the Appendix, the examples appear in normal spelling, without special markings.

complex onsets or which of them are complex onsets if any? Or more generally, is there evidence that any consonant cluster in the language behaves as a branching onset? Note that the fact that word-initial clusters are no longer repaired but are tolerated does not in itself argue for a branching onset interpretation — the extra consonants could easily be licensed by some edge mechanism. In principle, three positions can be taken in this matter: one can claim (i) that all relevant clusters are branching onsets and there are no edge clusters (at the left edge of domains) in the language; (ii) that some of the relevant clusters are true branching onsets, while others are edge clusters; and (iii) there are no branching onsets in the language, and all the relevant clusters are edge clusters. As opposed to some other studies[15] of Hungarian syllable structure, we take the third position.[16] The evidence is mainly negative and cumulative: it seems there is no proof that it is necessary to analyse any cluster as a branching onset, while some clusters can be shown not to behave like complex onsets at all. Let us examine the Hungarian phonological phenomena that bear on this problem. Unsurprisingly, there are two types of relevant phenomena: alternations/processes that seem to be sensitive to syllable structure and phonotactic patterns.

1.1. Stem-internal V~ø alternations

If one takes the traditional view and sees epenthesis as a rescue operation for unsyllabified/unsyllabifiable consonants, then stem-internal V~ø alternations seem to be evidence that onsets may not branch in Hungarian.

There is a class of stems in Hungarian that exhibit V~ø alternation. In these stems (traditionally called "epenthetic stems", cf. Vago (1980)) the vowel which alternates with zero (henceforward the "unstable vowel") is always in the last syllable and is never (preceded or) followed by a consonant cluster. The vowel appears when the stem is in isolation or is followed by a consonant-initial suffix. There is no vowel if the suffix is vowel-initial. The height of the unstable vowel is predictably mid and vowel harmony determines its frontness/backness and rounding (it is regularly /ɛ, ø, o/[17]):

(7)	*retek*	*retek-től*	*retk-ek*
	vödör	*vödör-től*	*vödr-ök*
	szobor	*szobor-tól*	*szobr-ok*

Since the height, frontness/backness and rounding of the unstable vowel is predictable, and there exist near-identical pairs of stems such that in one of the members of a given pair the

[15]Törkenczy (1994), for instance, which a detailed analysis of Hungarian syllable structure, takes the second position.

[16]Ritter (1995) also assumes that there are no branching onsets in Hungarian, but presents no evidence against alternative views.

[17]There are a handful of exceptions, for a full list cf. Törkenczy (1992).

last vowel is unstable, while in the other it is not, in the same environment, the phenomenon is traditionally analysed as epenthesis[18] (8a). In this analysis, underlyingly, vowel~zero stems end in two-member consonant clusters that are unsyllabifiable, and are broken up by an epenthesis rule if they are not followed by a vowel-initial suffix; non-alternating stems, on the other hand, end in VC or VCC whose final cluster is syllabifiable (8b). If an epenthetic stem is followed by a vowel-initial suffix, the stem-final consonant syllabifies as the onset of the initial syllable of the suffix and is thus rescued.[19]

(8)	a.	*terem (term-ek)*	vs.	*perem (perem-ek)*
		vödör (vödr-ök)	vs.	*csődör (csődör-ök)*
		szobor (szobr-ok)	vs.	*labor (labor-ok)*
	b.	*terem* /tɛrm/		*perem* /pɛrɛm/
		vödör /vødr/		*csődör* /ʧøːdør/
		szobor /sobr/		*labor* /lɔbor/

What makes this phenomenon interesting is that while a stem-final consonant C_i syllabifies with a following vowel-initial suffix -V... (consequently, there is no epenthesis before C_i) cf. (9a), a stem final C_i does not syllabify with the initial C_j of a consonant-initial -C_jV... suffix *even if* C_iC_j *is an attested word-initial consonant cluster* (consequently, epenthesis does occur before C_i) cf. (9b):

(9)[20]	a.	*retk-ek*	/rɛtk-Vk/	rɛt.kɛk		
	b.	*retek*	/rɛtk/	rɛt.k′	→	rɛ.tɛk
		retek-től	/rɛtk-tøːl/	rɛt.k′.tøːl	→	rɛ.tɛk.tøːl
		retek-ről	/rɛtk-røːl/	rɛt.k′.røːl	→	rɛ.tɛk.røːl

As can be seen in (9b), there is no difference between the behaviour of *retektől* and *retekről* in spite of the fact that /kt/ is not attested word-initially, but /kr/ is (e.g. *krém*, *kretén*, etc). One could say that the reason why /kr/ does not syllabify as an onset is that branching onsets are not permitted in Hungarian. If they were, one would not expect epenthesis before the /k/ in this case as rɛt.krøːl **retkről* could be fully syllabified. This can be taken as evidence that /kr/, and by analogy all word-initial consonant clusters, are not branching onsets, but are licensed by some edge mechanism.

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[18]For two (dissimilar) alternative views cf. Kornai (1990) and Törkenczy (1992).

[19]This view of epenthetic stems and Hungarian stem internal epenthesis can be straightforwardly carried over and translated into an analysis in Optimality Theory, a non-derivational framework (cf. Törkenczy (1995)), so a non-derivational approach in itself does not necessarily exclude this view. Note that at the end of this paper (in Section 2.2) we argue for a different analysis.

[20]Notation: a dot marks a syllable boundary and C′ is an unsyllabified consonant.

The problem, however, is that this argument about the impossibility of branching onsets can be easily translated into an argument based on domains. Suppose that -C_jV... suffixes (as opposed to -V... suffixes) form their own domain which is a new domain of syllabification, i.e. syllabification cannot cross the boundary of this domain. This distinction is traditional and has many incarnations in different theories (cf. Harris 1994), but we are going to borrow the terms GP uses and refer to the "hard" domain as analytical and the "soft" one as synthetic.[21] A syllable then cannot span the edge of an analytical domain, but it can span the edge of a synthetic one. Given this distinction, the occurrence of epenthesis before the /k/ in *retekről*, or, equivalently, its failure to form an onset with the following /r/, can be seen as due to the fact that *-ről* starts a new analytical domain rather than the impossibility of branching onsets in Hungarian; compare *retekről* [rɛtk] røːl] vs. *retkek* [rɛtkVk].[22] There is plenty of evidence for -C_jV... suffixes being analytic. For instance, there seem to be no phonotactic restrictions between stem-final consonants and the initial consonants of -C_jV... suffixes: any suffix-initial consonant can follow any stem-final one.[23] Given this state of affairs, the original argument against branching onsets based on stem internal epenthesis disappears. In order to rescue it, we would need to find the same situation occurring with suffixes that are not analytical. The suffixes which are interesting in this respect are the ones that begin with two consonants (there are no suffixes beginning with more than two consonants in Hungarian).

It is an interesting characteristic of -C_iC_jV... suffixes that in general none of them begins with a consonant cluster C_iC_j where C_iC_j is a possible word-initial cluster. The one exception is the associative suffix, which begins with /ʃt/, an attested word-initial cluster (e.g. *stop*, *stílus*, etc.). This suggests that all the suffix-initial clusters in (10a) are syllabified in such a way that they straddle a syllable boundary (since they cannot form onsets). The question is whether the initial cluster of the associative suffix is syllabified in the same way.

(10)	a.	*-tlan/-tlen*	PRIVATIVE '-less': *fej-etlen*
		-cska/-cske	DIMINUTIVE: *bot-ocska*
		-nként	DISTRIBUTIVE 'by/every ...': *egy-enként*
		-nta/-nte	DISTRIBUTIVE-TEMPORAL 'every ...': *nap-onta*
	b.	*-stul/-stül*	ASSOCIATIVE 'together with ...': *bot-ostul*

[21]To be precise, GP uses the terms somewhat differently, because it does not have a syllabification process (syllable structure is present underlyingly), cf. Kaye (1995).

[22]We use the symbols [and] to indicate the edges of analytical domains. Synthetic domain-edges, being invisible to phonology, are not indicated (cf. Kaye(1995)).

[23]The restrictions that do apply in this context are either completely unrelated to syllable structure (some assimilations) or also apply across a word-boundary (degemination).

Significantly, *all* the clusters in (10) behave in the same way with respect to V~ø alternation (compare (11a) and (11b)). These suffixes must be preceded by a vowel[24] when attached to a consonant-final stem. They only begin with their respective consonant clusters when they follow vowel-final stems:

(11)	a.	*ágyú*	*ágyú-cska*	*[aːɟuoʧkɔ]
		bicikli	*bicikli-cske*	*[biʦikliɛʧkɛ]
		bot	*boto-cska*	*[botʧkɔ]
		sör	*sörö-cske*	*[ʃørʧkɛ]
	b.	*ágyú*	*ágyústul*	*[aːɟuoʃtul]
		bicikli	*biciklistül*	*[biʦikliɛʃtyl]
		bot	*botostul*	*[botʃtul]
		sör	*söröstül*	*[ʃørʃtyl]

When analysed accepting the same assumptions as in the analysis of stem-internal epenthesis above, this means that a vowel is inserted before these suffixes (which underlyingly begin with consonant clusters in this analysis) to ensure exhaustive syllabification — otherwise the stem-initial consonant would remain stray. The question, of course, is why this seems to apply to initial /ʃt/, too, in spite of the fact that it is an attested word-initial cluster. A possible answer is that /ʃt/ is not a well-formed onset (either because /ʃt/ specifically — perhaps /s, ʃ/ initial clusters in general, cf. Kaye (1992) — is disallowed as an onset, or because complex onsets are unpermitted in Hungarian). In the discussion of -C_jV suffixes above we saw that an identical argument could be translated into an argument based on domains. In other words, can we account for the behaviour of -C_iC_jV... suffixes by saying that they (like -C_jV suffixes) belong to an analytical domain different from that of the stem? Would such an assumption explain why a vowel appears before *-stul/-stül* when it is attached to a consonant-final stem?

First of all, notice that the two assumptions, the one about the well/ill-formedness of complex onsets and the other about the analytic/synthetic domains of suffixes, are not incompatible: it is in principle perfectly possible, for instance, that complex onsets are disallowed in Hungarian and the suffixes in question form their own analytic domains *at the same time*. In the discussion of -C_jV suffixes above the assumption that complex onsets are ill-formed and the assumption that -C_jV belong to an analytical domain different from that

[24]The quality of this vowel is the same as that of the unstable vowel of epenthetic stems. The vowel is subject to lowering after "Lowering Stems" (compare *bot-ostul* with *fal-astul* cf. Vago (1980). Note that the initial vowel of *-tlan/-tlen* is always a(n underlyingly) low vowel (e.g. *pár-atlan*) (we are grateful to László Kálmán for drawing our attention to this fact).

of the stem always give the same result, consequently, only one of them needs to be maintained (as Occam's razor would require). Let us examine if the same state of affairs obtains here as well. Given the fact that the analytic/synthetic suffixation distinction and the well-formed/ill-formed complex onset distinction bifurcate, there are four possibilities: (i) the suffix in question may be analytic and complex onsets may be permitted; (ii) it may be analytic and complex onsets may be unpermitted; (iii) it may be synthetic and complex onsets may be permitted; and (iv) it may be synthetic and complex onsets may be unpermitted. Let us see what predictions these different combinations make about the behaviour of *-stul/-stül* (the forms in (12) are underlying forms (after syllabification)):

(12)[25]			
	a.	**analytic**	**synthetic**
	complex onset: OK	[aː.ɟu] ʃtUl]	[aː.ɟu.ʃtUl]
	complex onset: BAD	*[aː.ɟu] ʃ'.tUl]	[aː.ɟuʃ.tUl]
	b.	**analytic**	**synthetic**
	complex onset: OK	*[bot] ʃtUl]	*[bot.ʃtUl]
	complex onset: BAD	[bot] ʃ'.tUl]	[bot.ʃ'.tUl]

(12a) shows the predicted behaviour of the associative suffix when attached to vowel-final stems. As can be seen in (12a) we only make a wrong prediction if we assume that *-stul/-stül* is analytic *and* that complex onsets are unpermitted.[26] It is only in this case that /ʃ/ is stray (i.e. epenthesis is predicted: *[aːɟuoʃtul]). In all the other cases in (12a) the forms are syllabifiable without repair, and the right prediction is made. Thus, (12a) shows that we cannot disallow complex onsets and maintain that *-stul/-stül* is analytic at the same time.

(12b) shows predictions for the same suffix when attached to a consonant-final stem. The expected behaviour is epenthesis before the /ʃ/: [botoʃtul]. It is evident that incorrect predictions are made if we assume that /ʃt/ is a complex onset *irrespective of whether the suffix is taken to be analytic or synthetic* (*[botʃtul]).

Taken together, (12a) and (12b) demonstrate that (i) /ʃt/ cannot be a complex onset; (ii) *-stul/-stül* must be synthetic. Evidently, this is a case in which the argument against a complex onset interpretation in Hungarian cannot be translated into an argument based on

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[25]Capital vowel letters in transcriptions are only used to indicate informally that some of the features of the vowel are the result of spreading and need not be specified with the vowel in question in the underlying representation.

[26]Other, less general statements that constrain the class of possible complex onsets (e.g. that /ʃ/ or /s/ initial complex onsets are ill-formed, or that /ʃt/ alone is ill-formed) would have the same effect. It is our intention to formulate such statements as generally as possible, but notice that the degree of generality is immaterial from the point of view of the argument itself.

domainhood. There are no other -C_iC_jV... suffixes in Hungarian whose initial consonant clusters are attested word-initial clusters. Thus, minimally, the above argument is one against /ʃt/ being a complex onset; maximally, it is an argument against complex onsets in general in the language.

Before moving on to other pieces of (possible) evidence bearing on the problem of complex onsets in Hungarian, let us note in passing that the analysis outlined above has two serious defects. The first problem is that epenthesis seems to occur in epenthetic stems even if the final underlying cluster of the stem is a possible word-final cluster:[27] compare ***fürd-ik*** ~ ***füröd-ni*** with ***kard*** ~ ***kard-nál*** ~ ***kard-om***. This is extremely problematic for a view of epenthesis such as the one described above. The second (related) problem concerns -C_iC_jV... suffixes. When these suffixes are attached to consonant-final stems, epenthesis occurs even if in principle C_i could syllabify as the last consonant of the complex coda of the stem-final syllable. Thus, *sör* plus *-stül* could easily syllabify as *[ʃørʃ.tUl] (compare the final clusters in stems like *vers, sors,* etc.) and there would be no degenerate structure for epenthesis to repair. Under a view of epenthesis described above it is difficult to explain what prevents suffix-initial /ʃ/ from joining the preceding syllable. (Remember that it does syllabify with the final syllable of a vowel-final stem; and we have seen that the suffix in question is not analytic.) We have no ready answer to these problems, but we want to point out that they seem to stem from this particular view of epenthesis — we will sketch a possible remedy and an alternative analysis below in Section 2.2.

1.2. Medial -CCC- clusters

We have demonstrated in the previous section that, minimally, one of the clusters that occur in word-initial position is not a branching onset. The data we have reviewed (and all Hungarian syllable-structure sensitive alternations for that matter) are compatible with a claim that in fact *none* of the word-initial clusters are complex onsets (i.e. that all of them are edge clusters). So let us take a bold step and assume that this claim is indeed true and see if there is any evidence for branching onsets in Hungarian phonotactics. Given that the word-initial and word-final positions are suspect (since the clusters occurring in these positions may be due to some edge mechanism), the most promising place to look for such evidence is medial. Furthermore, it is medial -CCC-clusters[28] that we must focus on, since a medial two-member cluster can in principle be syllabified in such a way that the syllabification does not produce

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[27]Cf. Törkenczy (1992).

[28]Or even more complex medial clusters — but medial clusters of more than three consonants are virtually nonexistent in Hungarian. In the database there is only one item containing a five-member medial cluster (/kʃtr/ *angström*) and there are 23 monomorphemic items with a four-member medial cluster (e.g. *szanszkrit, lajstrom, expressz,* etc.).

any complex constituent (-C.C-). The syllabification of a -CCC- cluster, however, will result in a complex syllabic constituent, either a coda or an onset (-CC.C- or -C.CC-).[29]

First of all, let us point out that *regular* medial -CCC- clusters are expected if complex onsets are allowed in the language — they could be exhaustively syllabified as -C.CC-.[30] Therefore, the lack/scarcity/irregularity of medial -CCC-clusters can be taken to suggest that branching onsets are ill-formed.

At the first sight, Hungarian seems to have plenty of word-medial -CCC- clusters. However, the main source of such clusters is analytic suffixation (e.g. [*kard*] *ból*], [*vers*] *ről*], [*elv*] *telen*], etc.) and compounding (e.g. [[*vers*] [*láb*]], [[*elv*] [*társ*]], etc.). We have pointed out above that clusters straddling the edge of an analytic domain do not tell anything about the phonotactics of the language, they are "accidental" in the sense that no phonotactic restrictions apply across analytic domain edges — the relevant consonants are just juxtaposed without any restrictions.[31] Thus, "real data" are monomorphemic items, or words with synthetic suffixation containing medial -CCC-.[32] Interestingly, there are no examples in Hungarian of synthetic suffixation creating -CCC- clusters (cf. the discussion of -C_iC_jV... suffixes above). There *are* monomorphemic words with -CCC- clusters in the language, but, significantly, their number is rather low, about 300 items in our database (examples: *bisztró, centrum, komplex, export, improvizál, instancia, ostrom,* etc.[33]). Furthermore, there are 94 types altogether that the approximately 300 tokens exemplify, but, typically, the number of tokens in a given type is extremely low. There are only 7 types with 10 or more tokens[34] and the majority of types (n=48) only have one token. This suggests that medial -CCC- clusters are special/irregular in Hungarian.

It could be a basis for a possible counterargument that (monomorphemic) medial -CCC- clusters do display certain regularities. Figures (13) and (14) summarise some of them:

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[29]This is not always true in a theory that allows (underlying) empty nuclear positions (e.g. GP) where an empty nucleus (v^0) may break up a cluster of seemingly adjacent consonants, and thus -CCC- need not necessarily syllabify into a structure that contains a complex constituent (e.g. -C.Cv^0.C-).

[30]Naturally, complex codas could also produce such clusters (syllabified as -CC.C-). For a discussion, see the section on complex codas.

[31]See note 23.

[32]The latter would be phonologically indistinguishable from monomorphemic words.

[33]All the relevant words are loans, but, naturally, this does not in itself say anything about their well-formedness in Hungarian.

[34]The list of words above gives one example for each of these "more populous" types (/str, ntr, mpl, ksp, mpr, nʃt, ʃtr).

(13)[35]	— **C1**	**C2**	**C3** —
a.		C2≠[+son]	
b.	IF C1=[-son, -cont] THEN C1≠[+cor]		
c.	IF C1=[s, ʃ]	THEN C2=[-son, -cont]	
d.	IF C1=[-son, -cont] &	C2=[-son, -cont]	THEN C3=[+son]
e.	C1=[+son]	IF C2=[-son, -cont] &	C3=[-son, -cont]
f.	IF C1<C2	THEN C2=[s, ʃ]	
g.	IF C1≈C2	THEN C2=[+coronal]	

(14) Preferred sonority profile:		
	C1>C2	(71 out of 94)
	C2<C3	(61 out of 94)
	C1>C2<C3	(56 out of 94)

We want to claim that these regularities (and other possible ones crucially referring to medial -CCC-) are accidental in Hungarian in that they only reflect some of the regularities of the source languages the relevant words were borrowed from.[36] More precisely, if a constraint obtaining between -C1C2C3- is non-accidental, then we have to do with either of the following two situations: (i) it is identical with a constraint obtaining between the consonants of a corresponding two-member medial cluster -C1C2-, and thus reduces to a constraint applying between a syllable-final consonant and the following syllable-initial one, i.e. it is an interconstituent constraint (e.g. there are no words with medial *-tpC-* in Hungarian, but there are no words containing medial *-tp-* either); (ii) the constraint has nothing to do with syllable structure at all (e.g. adjacent obstruents have to agree in voicing in Hungarian). Otherwise, all apparent medial -CCC-specific constraints are accidental, just "debris" of the constraints that exist in the languages the particular words containing them were borrowed from.[37]

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[35]Notation: x>y "x is more sonorous than y"; x<y "x is less sonorous than y"; x≈y "x and y are equally sonorous".

[36]Of course, this does not mean that an explanation of why these clusters are not repaired is not in order, see a possible explanation below.

[37]Inasmuch as the real constraints in the source language reflect a universal restriction, naturally, the accidental Hungarian one will display it too, cf. the sonority restrictions/tendencies in (14): the preferred type C1>C2<C3 obviously reflects the source

Another argument for the special character of -CCC- clusters involves a comparison of -CC- clusters and -CCC- clusters. In a language that permits branching onsets we expect to find -C1C2C3- clusters where C2C3 is a branching onset and -C1C2- is a permitted interconstituent cluster (-C1.C2C3-). And *vice versa*, in general, for every -C1C2C3- cluster we should find a matching -C1C2- cluster if the latter is a permitted interconstituent cluster. Of course, accidental gaps may exist, but this should be the general tendency. It is interesting to compare English and Hungarian since, in the literature, it is generally accepted that English has branching onsets. As can be seen in (15), English is well-behaved with respect to the generalisation above.

(15)	English	**VC1C2V**	**VC1C2C3V**
	-kt-	*vector*	*electronic*
	-pt-	*chapter*	*dioptry*
	*-tk-	–	–
	*-pk-	–	–
	*-tp-	–	–
	*-kp-	–	–

Hungarian, on the other hand, is very different: some -C1C2C3- clusters corresponding to well-formed -C1C2- are curiously missing (16).

(16)	Hungarian	**VC1C2V**	**VC1C2C3V**
	-kt-	*akta*	*spektrum*
	-pt-	*kapta*	*dioptria*
	-tk-	*atka*	–
	-pk-	*lepke*	–
	*-tp-	–	–
	*-kp-	–	–

We can either say that the missing clusters are accidental gaps, or the other explanation is that complex onsets are ill-formed. We opt for the latter interpretation.

It has to be pointed out here that the fact that branching onsets are not permitted does not in itself explain the scarcity/irregularity of -CCC- clusters. The reason is that a -CCC- cluster can in principle be parsed exhaustively even if it does not contain a branching onset: it could consist of a complex coda and a following non-branching onset: -CC.C-. This can raise the question whether complex codas are well-formed in Hungarian.[38] If the answer is

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language situation C1.C2C3 where C2C3 *is* a complex onset (C1>C2 is a universal interconstituent restriction/tendency while C2<C3 is a universal intra-onset restriction/tendency). In this way, Hungarian appears to conform to a constraint that refers to a complex constituent it arguably does not have.

[38]GP has a "built-in" negative answer to this question since the theory does not permit complex codas (it does not even have a coda constituent, cf. Kaye, Lowenstamm and

negative, it follows that medial -CCC- are ill-formed (assuming that complex onsets are also ill-formed word-initially and word-medially). There are words ending in more than one consonant, but this does not in itself ascertain the status of these final clusters as complex syllabic constituents. We will return to this problem in Section 2.

The phonotactics of -CCC- clusters suggests that branching onsets are not permitted in Hungarian. This means that in all of the examples cited in (6) the initial clusters are due to (or licensed by) some edge mechanism. However, while some edge mechanism can be invoked to account for domain-initial (and domain-final) non-constituent clusters, a similar solution does not seem to be available for the analysis of the few -CCC- medial clusters that do occur in monomorphemic words.[39] The problem is that they are not simplified or broken up in Standard Hungarian. What licenses them? If complex onsets (and codas) are not permitted, words like *obskurus* [opʃkuruʃ], *exponál* [ɛksponaːl], or *templom* seem unsyllabifiable.

A possible answer is to say that these words exhibit an extreme mismatch between morphological structure and phonological structure which is the reverse of the commonplace situation when the edge of a morphological domain is invisible to phonology (synthetic affixation). In particular, we would like to tentatively suggest that, although the words discussed are monomorphemic, they are treated in Hungarian as if they were compounds, i.e. a morphologically unitary domain is phonologically analysed as if it were two domains:

(17)	*obskurus*	[[op] [ʃkuruʃ]]	or	[[opʃ] [kuruʃ]]
	exponál	[[ɛk] [sponaːl]]	or	[[ɛks] [ponaːl]]
	templom	[[tɛm] [plom]]	or	[[tɛmp] [lom]]

This assumption would permit an analysis that accounts for medial -CCC- clusters by referring to an edge mechanism. The problem, of course, is that of "excessive" or unrestricted use of such a move: in principle an analyst can resort to it whenever (s)he is in trouble (i.e. when the analysis does not seem to work). What is needed is a theory that restricts the possibility of phonologically reanalising, or "splitting", a unitary morphological domain (i.e. when is such an move theoretically possible?), and independent language-specific evidence, preferably both. The former task is definitely beyond the scope of this paper. As for the latter task, the reanalysis of unitary morphological domains in words containing medial -CCC- clusters is certainly compatible with all Hungarian facts (to the best of our knowledge), so

Vergnaud (1990), Harris (1994)).

[39]Regardless of the theoretical differences, there is a general agreement in the literature that edge-effects (i.e. the special structures discussed in Section 0.) are restricted to domain-edges (cf. Hayes (1981)). There are few less restrictive analyses (e.g. Rubach & Booij (1990)).

there is no counterevidence.[40] Direct evidence, however, is difficult to come by. We know of one piece of evidence that seems to suggest that the reanalysis is indeed correct — though it has to be made clear that the evidence is not conclusive. What we need is a phonological phenomenon that applies in non-compounds, but does not apply in compounds. Front/back harmony is such a phenomenon is Hungarian: in general, the vowels of monomorphemic stems and suffixes harmonise regardless whether they are analytic or synthetic ([*öröm*], [*orom*], [*bot*] *ban*], [*botostul*]). This pattern is "muddled" somewhat by the neutral vowels. The neutral vowels are *i* [i], *í* [iː], *é* [eː], and there is disagreement about the interpretation of *e* [ɛ].[41] Compounds do not harmonise ([[*kő*][*por*]] [køːpor]). Interestingly, words containing medial -CCC- or longer medial consonant clusters are frequently non-harmonic (e.g. *angström, ösztrogén*). This fact can be used to buttress our analysis of these words. Unfortunately, however, most of the disharmonic examples contain *e* as a non-harmonising vowel. This means that our "evidence" goes out of the window if *e* is a neutral vowel — but it seems valid if *e* is a harmonic one. As there are arguments for both points of view,[42] we leave this matter open here.

Because of the fact that it allows empty nuclei to appear in the representation, and that they may not only be licensed to be phonetically unexpressed by a domain edge[43], GP affords another way to license the few occurring medial -CCC-: the licensed empty nucleus may break up the cluster:

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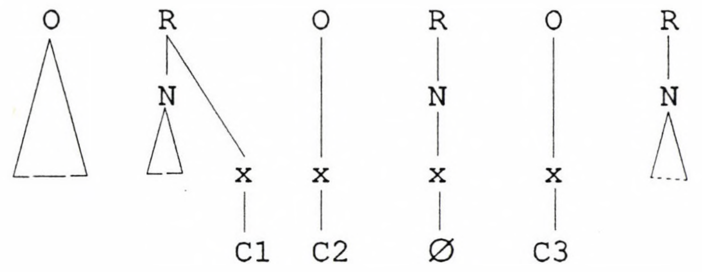
[40]Stress, for instance, is compatible with a compound (as well as a non-compound) analysis: both compound and non-compound words have initial stress.

[41]There is an abundance of analyses of Hungarian vowel harmony in the literature. For a detailed and reliable discussion of the facts cf. Nádasdy & Siptár (1994).

[42]Cf. Nádasdy & Siptár (1994).

[43]They may be licensed by being properly governed, cf. Kaye, Lowenstamm & Vergnaud (1990), Charette (1991).

(18)[44]



Without discussing the possible licensing mechanisms any further, we just want to point out that it is possible to maintain (as we do) that branching onsets are ill-formed in Hungarian and still account for the fact that the few monomorphemic items with medial -CCC- are not repaired.

1.3 Two non-arguments for complex onsets

We would like to finish the discussion in this section by showing that an argument for complex onsets based on some optional "very late" and/or fast-speech processes is untenable.[45] The first one involves variation of the length of the vowels *á* and *é* (/aː/, /eː/). In some words these vowels may be optionally shortened into [a] and [e], respectively.[46] Comparing the data in (19a) and (19b) one might (hastily) conclude that Optional *á/é* Shortening has to do with syllable structure: it is only possible in closed syllables. By implication, the second syllable of words in (19b) (the words in which shortening may not apply), presumably begins with a branching onset. However, the data in (19c) show that Optional *á/é* Shortening is unrelated to syllable structure: these words behave like those in (19b), i.e. like the words that putatively contain branching onsets, although the medial clusters in the words in (19c) are not possible onsets (or word-initial clusters). What seems to be important is the continuancy of the second consonant: if it is a continuant, shortening is not possible:

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[44]This structure is only available for certain -C1C2C3- clusters (/mpl/, for instance, as in *templom*). Other -C1C2C3- clusters would have a different structure — also involving empty nuclear positions. The GP analysis of the structure of these clusters is outside the scope of the present paper. For a discussion of some aspects of this problem cf. Ritter (1995).

[45]Dressler & Siptár (1989), for instance, assume that branching onsets are well-formed and crucially refer to this fact in their analysis of the second process to be discussed here.

[46]Note that [a] and [e] are not underlying vowels in Hungarian (for a discussion, see Siptár (1993, 1994). Note also that this "shallow" shortening is distinct from regular /aː/ ~ /ɔ/ and /eː/ ~ /ɛ/ alternations that are found in various contexts (see Nádasdy & Siptár (1994)).

(19)	a.	*Márta* [maːrtɔ, martɔ]	b.	*Mátra* [maːtrɔ, *matrɔ]
		férges [feːrgɛʃ, fergɛʃ]		*végre* [veːgrɛ, *vegrɛ]

c.	*vádli*	[vaːdli, *vadli]
	hétfő	[heːtføː, *hetføː]
	vánszorog	[vaːnsorog, *vansorog]

The optional simplification of medial -CCC- clusters in fast speech is a process which has been claimed to be conditioned by syllable structure.[47] In some words the C2 of a medial -C1C2C3- can be left out in fast speech. Such a deletion, however, is not always possible. The conditioning factors are remarkably similar to those we identified for Optional *á/é* Shortening. A comparison of (20a) and (20b) might suggest that the deletion is not possible if C2 can form a complex onset with C3 (20b). Otherwise, if C2C3 is not a possible branching onset, C2 can be deleted (20a). This can be seen as an argument for the existence of complex onsets in Hungarian. However, the deletion of C2 is not possible in the words in (20c) in spite of the fact that the C2C3 clusters that occur in these words cannot form a complex onset either. Again, as in the case of Optional *á/é* Shortening above, it is the continuancy of C3 that seems to matter: if it is a continuant, the deletion of C2 is impossible even if C2C3 cannot form a branching onset. (20d) and (20e) are included for the sake of completeness and are meant to show that the conditioning of Fast -CCC- Simplification is even more complex: it does not seem to be possible if C1 = /r/ (20d) or if C2 is a coronal strident obstruent (20e). The data in (20f) and (20g) show that Fast -CCC- Simplification applies in compounds and across a word-boundary, too. The point is that Fast -CCC- Simplification (like Optional *á/é* Shortening) is independent of syllable structure, and is not an argument for complex onsets.

(20)	a.	*lam~~b~~da*	b.	**ám~~b~~ra*
		asz~~t~~ma		**rin~~g~~ló*
		rön~~t~~gen		**tem~~p~~lom*
		plan~~k~~ton		**usz~~k~~ve*

c.	**han~~d~~lé*
	**kom~~p~~júter*
	**szfin*[~~k~~s]*et*

d.	**par~~t~~ner*	e.	**ek~~sz~~tázis*
	**infar~~k~~tus*		**col~~s~~tok*
	**szer*[~~p~~]*-től*		**pol~~c~~-tól*
	**kor~~d~~-bársony*		**tren~~cs~~kót*
f.	*lom*[~~p~~]*-korona*	g.	*mos~~t~~ pedig*
	ban~~k~~-tisztviselő		*dob~~d~~ bele*
	tes~~t~~-nevelés		*a*[s]~~t~~ *mondja*

[47]Cf. Ács & Siptár (1994).

To sum up the argument in this section: there is no evidence for branching onsets (it is possible to refute, or reanalyse all putative evidence); there is, however, some evidence against it (in stem-internal epenthesis patterns and the phonotactics of medial -CCC- clusters); consequently, we claim that *complex onsets are not well-formed in Hungarian.* All word-initial consonant clusters are edge clusters (i.e. are licensed by some edge mechanism) and the regularities they happen to display are just (fragmentary) reflections of the regularities of the source languages from which the words containing them were borrowed.

2. Complex codas/right edge

Lets us now examine complex clusters at the right edge of words and see if there is any reason for supposing that the clusters in question form (or do not form) complex constituents (branching codas). The following is an exhaustive list exemplifying word-final -CC clusters.[48] We have always given two examples whenever a given attested cluster occurs both separated and unseparated by a morpheme boundary. Only one example is provided if only one of these possibilities is found. The examples in (21a) all end in geminates.[49] The words in (21b) end in consonant clusters which are "typical" codas. In contrast, the final clusters in the words in (21c) and (21d) are "unusual" as codas: many of them are sonority sequencing violations, some contain a nasal followed by a non-homorganic fricative and some others (are extremely rare and) seem irregular for some other reason in Hungarian. All of the final clusters end in /s/ or /ʃ/ in (21c):

(21) a. *csepp; ott, olvad-t* [tː]*; pötty; sakk; több; kedd, ad-d; meggy, ad-j* [ɟː]*; agg; vicc, lát-sz* [ʦː]*; giccs, tát-s* [ʧː]*; bridzs* [ʤː]*; treff; klassz, eresz-sz; friss, has-s; néz-z; stramm; kinn; könny, szán-j* [ɲː]*; hall; orr; ujj, fal-j* [jː]*; pech* [xː]

b. *paraszt, lösz-t; est, kos-t; gerezd, néz-d; kolomp; int, sün-t; fánk; lomb; rend, bán-d; ring; konc; nincs, int-s* [nʧ]*; fajansz, ken-sz; pátens; vonz; lány-t; konty* [ɲc]*; hány-d; rongy* [ɲɟ]*, mond-j* [ɲɟ]*; talp; folt, él-t; halk; küld, öl-d; hölgy, áld-j* [lɟ]*; rivalg; polc; kulcs, ölt-s* [lʧ]*; golf; él-sz; fals; nyelv; film; szörp; tart, kar-t; korty; park; szerb; kard, vár-d; tárgy, hord-j* [rɟ]*; dramaturg; harc; korcs, tart-s* [rʧ]*; turf; kommersz, ver-sz; vers; érv; borz; törzs; reform; konszern; árny; lajt, fáj-t; hüvelyk* [jk]*; majd, fúj-d; cajg; Svájc; nefelejcs, felejt-s* [jʧ]*; dölyf; fédervejsz, fúj-sz; Majs; ölyv; rajz; pajzs; slejm; kombájn; fájl;*

c. *bicepsz, kap-sz; taps; vágy-sz; szex, rak-sz; voks; döf-sz; nyom-sz; hány-sz;*

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[48]As before, we concentrate on clusters consisting of two consonants for simplicity's sake. For some problems concerning more complex final clusters, cf. below.

[49]Of the Hungarian geminates only /vː/ and /ʒː/ do not occur word-finally. We consider this an accidental gap.

d. *recept; copf; lop-j; Detk; Batyk; akt; Szakcs; rak-j; dobd; dobj; nedv; edz; hagy-d; smaragd, fog-d; fog-j; barack; Recsk; tát-s-d* [ʤd]; *szaft; MAFC; döf-j; groteszk; hív-d; hív-j; küz-d-j* [zɟ]; *rezg; idős-b* [ʒb]; *pünkösd* [ʒd], *vés-d* [ʒd]; *esd-j* [ʒɟ]; *terem-t; nyom-d; terem-t-s* [mʧ]; *tromf; hamv; nemz; tömzs; szomj, nyom-j; ellenszenv; ajánl; enyv; enyh; görl; fürj, vár-j; bolyh; jacht* [xt]

As can be seen in (21), Hungarian has plenty of final consonant clusters. It is also clear that there *are* phonotactic restrictions between the members of (some of) these clusters.[50] The question is whether it is necessary to analyse (i) *all*, or (ii) *some*, or (iii) *none* of these clusters as branching codas. The first two of these positions are those that are usually taken in studies of Hungarian phonology.[51] Here we want to explore the third possibility and examine whether one can "get by" without considering *any* of the final clusters above to be branching codas. Through the examination of a central syllable structure-related phenomenon (vowel~ø alternation at the edges of morphemes) we want to suggest that the relevant data can be accounted for without reference to complex codas, i.e. that word-final clustering is an edge-effect in Hungarian. As in the previous section, we are primarily interested in the (interpretation of) evidence rather than the actual mechanism licensing these clusters.

2.1 Stem-external vowel~ø alternations

Our line of argument will be the following: We will examine vowel~ø alternations at morpheme edges and classify suffixes according to their behaviour with respect to this phenomenon, i.e. we will identify how many types of behaviour must be distinguished. Then, we will ask the question whether the distinction between complex and simple codas is necessary to account for all the different types of behaviour we have found. We intend to show that a reanalysis is possible and all the types can be distinguished with reference to distinctions other than the one between a branching vs. a non-branching coda. Furthermore, these distinctions are (also) needed independently of the phenomenon analysed.

Let us informally distinguish *syllabic*, *subsyllabic&syllabic* and *subsyllabic* suffixes. A suffix is syllabic if it can be a syllable or a sequence of syllables in itself (e.g. INESSIVE *-ban/-ben*); subsyllabic suffixes are smaller than a syllable in at least one allomorph (e.g. ACCUSATIVE *-ot/-et/-öt/-at/-t*); subsyllabic&syllabic suffixes consist of a syllabic portion preceded by material that cannot be incorporated in the following syllable in at least one allomorph (e.g. DISTRIBUTIVE *-onként/-enként/-önként/-nként*). Note that these terms are merely convenient labels and are not meant to refer to the representation of the suffixes (i.e. have no theoretical or analytical significance). The term *unstable vowel* is used as above: it denotes a vowel that alternates with zero.

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[50]For a detailed discussion, cf. Törkenczy (1994).

[51]For instance, Kornai (1994) and Olsson (1992) are examples for position (i) and Törkenczy (1994) is an example for position (ii).

(22)

	Syllabic		*Subsyllabic & Syllabic*	*Subsyllabic*		
Initial unstable V	–	+	+	+		–
Phonotactic interaction between stem-final C & initial C of suffix	–	+	–	+	–	–
Unstable V unrealised only after V-final stems		–	+	–	+	
Unstable V realised only after CC-final stems		+	–	–	–	
	A	***B***	***C***	***D***	***E***	***F***

(22) shows the behaviour of suffixes in relation to unstable vowels. It classifies syllabic, subsyllabic&syllabic and subsyllabic suffixes according to (i) whether they are preceded by an unstable vowel or not; (ii) whether there is phonotactic interaction between the stem-final consonant and the initial consonant of the suffix, i.e. whether the surface appearance/non-appearance of the unstable vowel depends on the identity or the number of the stem-final consonant(s); (iii) whether the unstable vowel is unrealised only after vowel-final stems; and finally (iv) whether the unstable vowel is realised only after CC-final stems. This covers all the (major) relevant factors determining whether an unstable vowel between a stem and a suffix is realised or not.[52] The shaded boxes in (22) indicate that a given choice is logically excluded. As can be seen in (22), syllabic, subsyllabic&syllabic and subsyllabic suffixes actually fall into 6 classes (*A, B, C, D, E, F*). (23) lists representative examples for each class (the minuses appear in the chart because there are no (underlying) vowel-final verb stems[53]):

(23)

A

INESSIVE -*bAn*	*ágyú-ban*	*bolond-ban*	*csap-ban*	*kölcsön-ben*	*szem-ben*
ALLATIVE -*hOz*	*ágyú-hoz*	*bolond-hoz*	*csap-hoz*	*kölcsön-höz*	*szem-hez*
TERMINATIVE -*ig*	*ágyú-ig*	*bolond-ig*	*csap-ig*	*kölcsön-ig*	*szem-ig*

B[54]

[52]There are a number of complications, some of which are briefly discussed later in the paper. For a detailed treatment of stems and suffixes, cf. Rebrus (1996).

[53]There *are* verb stems that end in a vowel in isolation (e.g. *sző, rí*), but, arguably, even these stems end in a consonant underlyingly (*szöv-ök, rív-ok)*, cf. Vago (1980, 1989).

INFINITIVE *-ni*	-	*mond-ani*	*csap-ni*	*köszön-ni*	*nyom-ni*
C					
ASSOCIATIVE *-stUl*	*ágyú-stul*	*bolond-ostul*	*csap-ostul*	*kölcsön-östül*	*szem-estül*
DISTRIBUTIVE *-nként*	*ágyú-nként*	*bolond-onként*	*csap-onként*	*kölcsön-önként*	*szem-enként*
D					
ACCUSATIVE *-t*	*ágyú-t*	*bolond-ot*	*csap-ot*	*kölcsön-t*	*szem-et*
PAST *-t(t)*	-	*mond-ott*	*csap-ott*	*köszön-t*	*nyom-ott*
E					
PLURAL *-k*	*ágyú-k*	*bolond-ok*	*csap-ok*	*kölcsön-ök*	*szem-ek*
PRES 2ND SG_{DEF} *-d*	-	*mond-od*	*csap-od*	*köszön-öd*	*nyom-od*
F					
$\text{IMPERATIVE}_{\text{DEF}}$ *-d*	-	*mond-d*	*csap-d*	*köszön-d*	*nyom-d*
$\text{IMPERATIVE}_{\text{INDEF}}$ *-j*	-	*mond-j*	*csap-j*	*köszön-j*	*nyom-j*

The suffixes in class *A* (cf. 23A) are syllabic suffixes which are never preceded by a realised unstable vowel on the surface. As we have pointed out above, there is no phonotactic interaction between the stem-final segment and the initial segment of these suffixes (cf. section 1.1 and note 23). Class *B* suffixes are different because — although they are syllabic — a realised unstable vowel precedes them if the stem ends in a consonant cluster. Otherwise, their initial unstable vowel remains unrealised (23B). Class *C* suffixes begin with a realised unstable vowel only if the stem to which they are attached is consonant-final. Otherwise, their initial unstable vowel is unrealised (23C). Class *D* suffixes differ from those in class *C* in that their initial unstable vowel is only realised if the stem ends in certain kinds of consonants: in general, the unstable vowel is unrealised after vowel-final stems and after stems ending in a (single) coronal nasal or coronal continuant (23D). Suffixes in class *E* are subsyllabic, and their initial unstable vowel is only unrealised after vowel-final stems (23E). Finally, class *F* suffixes are subsyllabic, but they are never preceded by a realised unstable vowel: they simply attach to any stem without any phonotactic restrictions applying between them and the stem (23F).

Now let us return to the question of how many types of behaviour must be distinguished and how. There seem to be six classes, but notice that there is no difference between the *behaviour* of classes *C* and *E*. They only appear in different columns in (22) because the suffixes in *C* are subsyllabic&syllabic while those in *E* are subsyllabic. This difference, however, is irrelevant since they behave in the same way with respect to unstable vowels. This reduces the number of types to five. A further reduction is possible since the *behaviour* of classes *A* and *F* is identical as well. Only their shapes are different, but obviously, it does not matter if a particular suffix of this kind is subsyllabic (like

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[54]There is a suffix, Pres 2nd Sg. indef. *-sz* , which is subsyllabic, but behaves exactly like *-ni*: *mond-asz, csap-sz, köszön-sz, nyom-sz.*

IMPERATIVE$_{DEF}$ *-d*), or syllabic (like INESSIVE *-bAn*), consonant-initial (like INESSIVE *-bAn*), or vowel-initial (like TERMINATIVE *-ig*) — they all behave in the same way. Thus, only four groups have to be distinguished: *AF, B, CE* and *D*. The question is how; or more specifically: is it necessary to refer to the complexity of codas to make the necessary distinctions?

Let us consider the following analysis. The suffixes in class *CE* begin with an underlying vowel which deletes in hiatus: e.g. PLURAL *-Vk*, ASSOCIATIVE *-VstUl*. These suffixes differ from those in classes B and D in that the suffixes in the latter classes are underlyingly consonant-initial and the vowel that appears before them in the relevant contexts is epenthetic: e.g. ACCUSATIVE *-t*, INFINITIVE *-ni*.

Class A must be distinguished from class *B* since it is possible to create medial -CCC- clusters with class *A* suffixation (*bolond-ban*), but not with class *B* suffixation (**mond-ni* (actual form: *mond-ani*)). Class *A* also has to be differentiated from class *CE* because hiatus created by class A suffixation is tolerated (*ágyú-ig*), but it is not when created by class *CE* suffixation (**ágyú-Vk* (actual form: *ágyú-k*), **ágyú-Vstul* (actual form: *ágyú-stul*)). Notice that the analytic vs. synthetic difference can be used to make precisely these distinctions: class *A* suffixation is analytic (hence the lack of phonotactic restrictions across the suffix boundary), but class *B* and *CE* suffixation is synthetic: e.g. (underlying) [*bolond*] *ban*] vs. [***mond-ni***]; [*ágyú*] *ig*] vs. [***ágyú-V****stUl*].[55] The emboldened sequences in the synthetic examples must be repaired because some phonotactic restriction applies.

So far we have made no reference to branching codas (notice that the complex clusters we have seen so far are all at domain edges (and hence an edge cluster analysis is not theoretically excluded)). However, a possible argument for branching codas may be put forward based on the distinction between class *D* and class *F*. Compare the behaviour of the ACCUSATIVE and the definite IMPERATIVE:

(24)	ACCUSATIVE	vs.	IMPERATIVE$_{DEF}$
	szem-t***		*nyo**m-d***
	szem-et		**nyom-od*

On the basis of pairs of forms like the above one could propose that it is a lexical difference between ACCUSATIVE *-t* and IMPERATIVE$_{DEF}$ *-d* that the former has to be incorporated into the final syllable of the stem (if possible) while the latter may be licensed by some edge mechanism. Thus, an epenthetic vowel will appear before ACCUSATIVE *-t* whenever a cluster of a stem-final consonant C_α plus *t* is not a well-formed complex coda (otherwise the *t* can be incorporated into the stem-final syllable), but a near identical cluster C_α plus *d* whose final consonant is IMPERATIVE$_{DEF}$ *-d* can appear word-finally without being broken up by an epenthetic vowel.[56] Naturally, such an analysis presupposes that complex codas are permitted in Hungarian. Notice, however, that we can use the synthetic – analytic distinction and

[55] In section 1 we have already seen that *-stUl* is synthetic and *-bAn* is analytic.

[56] For an analysis along these lines, cf. Törkenczy (1994).

account for the different behaviour of the ACCUSATIVE and the IMPERATIVE$_{DEF}$ (classes D and F in general) without having to refer to branching codas: ACCUSATIVE *-t* is synthetic and IMPERATIVE$_{DEF}$ is analytic: e.g. (underlying) [szem-t] vs. [nyom] d]. Of course, the mechanism whereby epenthesis happens with the ACCUSATIVE is still to be explained, but, significantly, the two classes of suffixes can be distinguished without reference to branching codas.

Finally, note that the suffixes in classes *B* and *D* behave very similarly: they are both synthetic and phonotactic restrictions apply between them and the preceding stem. The only difference between them is that the restrictions are different — the difference in their behaviour can be explained with respect to the particular phonotactic restrictions that apply. They can be distinguished without reference to branching codas. In fact, the phonotactic restriction that seems to govern the behaviour of the suffixes in class *B* follows if complex codas are not allowed. We have seen in section 1 that complex onsets are also not possible in Hungarian. Taken together, these two assumptions make medial -CCC- clusters unsyllabifiable. This would explain why epenthesis happens before INFINITIVE *-ni*, for instance, when it is attached to a stem ending in two consonants.

Thus, it seems that all the attested types of suffix behaviour (displaying vowel~∅ alternation) can be distinguished with reference to the segmental make-up of the suffixes (vowel-initial vs. consonant-initial) and the analytic vs. synthetic distinction.[57] This is summarised and exemplified in (25):

(25)	**vowel-initial**	**non-vowel initial**
analytic	*-ig* (*A*) [stem] *ig*]	*-d*$_{IMP}$, *-bAn* (*F, A*) [stem] *d*] ; [stem] *bAn*]
synthetic	*-Vk, -VstUl* (*C, E*) [stem-*Vk*]	*-t, -ni* (*B, D*) [stem-*t*] ; [stem-*ni*]

As can be seen, there is no phonotactic interaction between stem and suffix if the suffixation is analytic (vowel clustering and virtually any two-member consonant clusters are possible); if, however, suffixation is synthetic, hiatus is not tolerated (the suffix-initial vowel deletes)

[57]There are some problems, however: (i) the quality of the alternating vowel is predictable and is identical in class CE (where we consider the vowel underlying) and in class D (where we suggest that the vowel is epenthetic); (ii) there are some differences of behaviour even among suffixes belonging to the same class: e.g. within class D there is a contrast between the ACCUSATIVE and the PAST — epenthesis occurs in somewhat different environments: *kos-t* vs. *mos-ott*. We skirt these issues now and leave them for further research (for further details cf. Kálmán (1985), Papp (1975), Rebrus (1996)).

and some final two-term clusters are broken up by epenthesis.[58] Thus, there is no need to refer to branching codas, the difference between class F and class B can be made with reference to domains and therefore — as the branching coda vs. edge distinction is no longer needed to distinguish the two types of behaviour — both types of clusters (analytic and synthetic[59]) may be considered edge clusters. Given this hypothesis, there are two questions that we have to answer: (i) why/how does epenthesis break up some synthetic clusters? (ii) what licenses final clusters? In what follows we try to sketch a tentative answer to these questions.

2.2. Stem-internal V~ø alternations revisited

Consider again stem-internal epenthesis:

(26)

		I	II	III
	α	*szobor*	*labor*	*br#
		szobr-on	*labor-on*	
	β	*torony*	*szurony*	*szörny*
		torny-on	*szurony-on*	*szörny-ön*
	γ	*füröd-tek*	*mered*	*hord*
		fürd-és	*mered-és*	*hord-ás*

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[58]We would expect that larger than two-term final clusters may not be created by synthetic suffixation. Unfortunately, this is not true. Sometimes there is no epenthesis when the ACCUSATIVE is attached to a -VC1C2 final stem. This can only happen with certain stem-final consonant clusters. In all these cases the C2 of such a cluster is a consonant after which there is no epenthesis if it is the last consonant of a -VC2 final stem. This, however, is just a one-way correlation: there are final -VC1C2 clusters that require epenthesis before the ACCUSATIVE even though the corresponding final -VC2 clusters does not:

pad	pa**d-ot**			kos	ko**s-t**
szem	sze**m-et**			baj	ba**j-t**
				kölcsön	kölcsö**n-t**
kard	ka**rd-ot**	vers	ve**rs-et**	konstans	konsta**ns-t**
film	fi**lm**-et	férj	fé**rj**-et	konszern	konsze**rn-t**

We can offer no explanation (for an account which is unavailable in the present analysis, cf. Törkenczy (1994)).

[59]To save space, we will use "analytic cluster" to refer to clusters divided by an analytic boundary; a "synthetic cluster" is a cluster which is not thus divided.

If we assume the analysis of vowel~ø alternation outlined in section 1, data in (26α) is not problematic: a word-final cluster /br#/ is not syllabifiable, therefore, it is repaired by epenthesis if a stem happens to contain this final cluster underlyingly. No epenthesis happens if a vowel-initial suffix follows because the stem-final stray /r/ can syllabify with the suffix. The stems αI and αII behave differently (αII displays no vowel~ø alternation), but this can be attributed to a lexical difference between the two stems: underlyingly αI ends in CC (/br/) while αII ends in CVC (/bor/). Thus, αII is fully syllabifiable to start with, and therefore it does not show vowel~ø alternation. The data in (26β) and (26γ), however, are problematic for such an analysis. In both cases the problem is that the cluster which appears to be broken up in βI and γI are attested final clusters (βIII and γIII). Thus, a three-way distinction must be made in (26β) and (26γ) as opposed to the two-way distinction in (26α). The question is how.

One possible way is to resort to arbitrary lexical diacritics. We could say that (i) the stems in (26II) all end in CVC as opposed to the stems in (26I) and (26III), which all end in VCC; and (ii) epenthesis works as described above, but some stems in (26I) and/or (26III) have to be marked to exceptionally undergo/fail to undergo epenthesis. αI would always be the regular (unmarked) case; the actual markings in the βI, γI, βIII, γIII group could differ in different analyses — the choice being more-or-less arbitrary.[60]

Another — in our view, more attractive — way to make the necessary three-way distinction is to make use of the GP notion of empty nucleus: v^0 (cf. Kaye, Lowenstamm & Vergnaud (1990)). Then we could say that the stems in both (26I) and (26II) end in CVC, the difference is that the vowel in (26I) is empty, i.e. a nuclear position without segmental content (that is why it alternates with zero), while in (26II) it is full (V), i.e. it is a nuclear position with segmental content: *torv⁰ny* vs. *szurVny*.[61] The discussion of the calculus specifying when empty nuclei can remain unexpressed is beyond the scope of this paper[62], the point we want to make here is that empty nuclei seem necessary if we want to account for the data in (26) (unless we want to choose the lexical analysis). Thus, empty nuclei seem to be the answer to the first question we asked in the discussion of final clusters above (i.e. why epenthesis breaks up some synthetic clusters).

Let us now turn to the second question (i.e. what licenses final clusters?). We want to claim that there are no branching codas in Hungarian and that all final consonant clusters

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[60]A relatively plausible proposal would be to mark βIII to prevent it from undergoing epenthesis (there are only three (free) stems ending in /rɲ/: *árny, szárny, szörny*) and to mark γI to (exceptionally) serve as an input to epenthesis (*füröd-/fürd-* is the only stem in which epenthesis breaks up stem-final /rd/). βI and γIII would be unmarked.

[61]Cf. Törkenczy (1992).

[62]For a discussion of the calculus (the Empty Category Principle, Interonset Government) and its application in Hungarian, cf. Kaye, Lowenstamm & Vergnaud (1990), Charette (1991), Törkenczy (1992), Harris (1994), Ritter (1995), Gussmann and Cyran (1996).

(synthetic and analytic) are edge clusters. Once we allow empty nuclei in the representation, it seems a logical step to use them to account for edge effects. Let us briefly sketch a possible analysis. Suppose that empty nuclei are licensed to remain empty at the edges of analytical domains and a coda consonant (a rhyme-final consonant) is only licensed if a filled onset follows.[63] These assumptions establish analytic domain-final consonants as onsets of "degenerate" syllables whose nucleus is empty: -.Cv^0].[64] The empty final nucleus analysis makes it possible for us to distinguish three kinds of "final" consonant clusters (all edge clusters): (i) an analytic type -V.Cv^0] Cv^0]; and (ii) two synthetic ones (a) -V.Cv^0 .Cv^0] and (b) -VC.Cv^0]. (iia) would be the type where vowel~ø alternations are expected in the middle of the cluster, and (i) and (iib) are the types where there are no vowel~ø alternations. The difference between (i) and (iib) is that there are no phonotactic restrictions between the two consonants in (i) while phonotactic restrictions are predicted to apply between the two consonants in (iib). These structures, then, are available for the analysis of the suffixes discussed. (27) is a version of (25) recast for the empty nucleus analysis:

(27)	**full vowel-initial**	**non full-vowel initial**
analytic	*-ig* (*A*) [stem] *i.gv^0*]	*-d*$_{\mathrm{IMP}}$, *-bAn* (*F, A*) [stem] *dv^0*] ; [stem] *bA.nv^0*]
synthetic	*-Vk, -VstUl* (*C, E*) [stem-*V.kv^0*]	*-v^{0}t, -v^{0}ni* (*B, D*) [stem-*v^0.tv^0*] ; [stem-*v^0.ni*]

The remaining structure -VC.Cv^0] unused so far is available for the analysis of "final" clusters that are never split by vowel~ø alternations: *hor.dv^0, szőr.nyv^0*

Admittedly, this is something of a sketch and the details remain to be worked out by further research, but even from this brief discussion it can be seen that all the necessary distinctions between the suffixes classified above can be made with the help of empty nuclei and no reference to a branching coda is necessary.

3. Conclusion

In the discussion above we have shown that branching constituents other than the nucleus and the rhyme are not necessary if we want to account for phonotactics and other syllable structure related phenomena in Hungarian. Rarely is it possible to demonstrate that a complex onset/coda analysis is absolutely untenable (i.e. there is little hard counterevidence), but neither is there any evidence for complex onset/coda behaviour in the sense that it is always possible to propose an alternative (simpler) analysis which makes no reference to complex

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[63]These are standard GP assumptions, cf. Kaye, Lowenstamm & Vergnaud (1990), Kaye (1990), for instance.

[64]For a similar proposal outside GP, cf. Burzio (1994).

onsets/codas. Therefore we claim that Hungarian does not have a branching onset or a branching coda. We suggest that the clusters that do occur at the edges of (analytical) domains are all edge clusters, the result of a licensing mechanism based on empty nuclei[65].

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[65]We have not discussed the licensing of clusters at the left edge of analytic domains, but we assume that the empty nucleus analysis can be extended to that site as well.

Appendix: glosses (in alphabetical order)

add 'give! (definite)'
adj 'give! (indefinite)'
agg 'very old'
ágyú 'cannon'
ágyúcska 'little cannon'
ajánl 'recommend'
akt 'nude'
akta 'file'
áldj 'bless!'
ámbra 'ambergris'
angström 'id.'
árny 'shadow'
asztma 'asthma'
atka 'mite'
azt mondja '(s)he/it says'
baj 'trouble'
bánd 'repent! (definite)'
banktisztviselő 'bank clerk'
barack 'peach'
barázda 'furrow'
Batyk <proper noun>
bicepsz 'biceps'
bicikli 'bicycle'
biciklicske 'little bicycle'
bisztró 'bistro'
blúz 'blouse'
bolond 'fool'
bolyh 'fluff'
borz 'badger'
bot 'stick'
botocska 'little stick'
bridzs 'bridge'
bronz 'bronze'
cajg 'cheap cloth'
centrum 'centre'
colstok 'folding rule'
copf 'plait'
csap$_N$ 'tap'
csap$_V$ 'hit (pres 3rd sg indefinite)'
csepp 'drop'
csődör 'stallion'
cvekedli <type of pasta>
Detk <proper noun>
dioptria 'dioptry'
dobd 'throw! (definite)'
dobd bele 'throw it in!'
dobj 'throw! (indefinite)'
döfj 'stab!'
döfsz 'stab (pres 2nd sg indefinite)'
dölyf 'arrogance'
dramaturg 'director's assistant'
drukkol 'cheer (pres 3rd sg indefinite)'
dzéta 'zeta'
edz 'train (pres 3rd sg indefinite)'
egyenként 'one by one'
eksztázis 'ecstasy'
ellenszenv 'antipathy'
élsz 'live (pres 2nd sg. indefinite)'
élt 'live (past 3rd sg)'
elvtárs 'comrade'
elvtelen 'without principles'
enyh 'relief'
enyv 'glue'
eressz 'let go!'
érv 'argument'
esdj 'beg!'
est 'evening'
exponál 'shoot with camera (pres 3rd sg indefinite)'
export 'id.'
expressz 'express'
fajansz 'faience'
fájl 'file'
fájt 'hurt (past 3rd sg)'
falastul 'together with the wall''
falj 'gobble!'
fals 'out of tune'
fánk 'doughnut'
fédervejsz 'talcum powder'
fejetlen 'headless'
felejts 'forget!'
férges 'worm-eaten'
férj 'husband'
film 'id.'
fjord 'id.'
flóra 'vegetation'

fogd 'hold! (definite)'
fogj 'hold!(indefinite)'
folt 'stain'
frász 'slap'
friss 'fresh'
ftálsav 'phthalic acid'
fújd 'blow! (definite)'
fújsz 'blow (pres 2nd sg indefinite)'
fürdés 'bathing'
fürdik 'bathe (pres 3rd sg indefinite)'
fürj 'quail'
fürödni 'to bathe'
fürödtek 'bathe (past 2nd pl indefinite)'
gerezd 'slice'
giccs 'kitsch'
gladiátor 'gladiator'
gnóm 'gnome'
golf 'id.'
görl 'girl in chorus line'
gróf 'count'
groteszk 'grotesque'
gvárdián 'Father Superior (of Franciscan monastery)'
hagyd 'allow (definite)'
halk 'quiet'
hall 'hear (pres 3rd sg indefinite)'
hamv 'ash'
handlé 'second-hand dealer'
hányd 'vomit! (definite)'
hánysz 'vomit (pres 2nd sg indefinite)'
harc 'fight'
hass 'influence! (indefinite)'
hétfő 'Monday'
hívd 'call! (definite)'
hívj 'call! (indefinite)'
hölgy 'lady'
hord 'carry (pres 3rd sg indefinite)'
hordás 'carrying'
hordj 'carry! (indefinite)'
Hradzsin <proper noun>
hüvelyk 'thumb'
idősb 'senior'
improvizál 'improvise (3rd sg indefinite)'
infarktus 'heart attack'
instancia 'instance'
int 'wave (pres 3rd sg indefinite)'
ints 'wave! (indefinite)'
iskola 'school'
jacht 'yacht'
kapsz 'get (pres 2nd sg indefinite)'
kapta '(boot) last'
kard 'sword'
kardnál 'at the sword'
kardom 'my sword'
kart 'arm (acc)'
kedd 'Tuesday'
kensz 'smear (pres 2nd sg indefinite)'
kinn 'outside'
klassz 'great'
klór 'chlorine'
knédli 'dumpling'
kölcsön 'loan'
kolomp 'bell'
kombájn 'combine-harvester'
kommersz 'cheap'
kompjúter 'computer'
komplex 'complex'
konc 'spoil'
könny 'tear'
konstans 'constant'
konszern 'concern'
konty 'bun'
kőpor 'sandstone powder'
korcs 'mongrel'
kordbársony 'corduroy'
korty 'swig'
kos 'ram'
kost 'ram (acc)'
köszön 'greet (pres 3rd sg indefinite)'
krém 'cream'
kretén 'cretin'
kulcs 'key'
küld 'send (pres 3rd sg indefinite)'
küzdj 'fight! (indefinite)'
kvarc 'quartz'
labor 'laboratory'
lajstrom 'list'
lajt 'water-barrow'
lambda 'id.'
lányt 'girl (acc)'

látsz 'see (pres 2nd sg indefinite)'
lepke 'butterfly'
lomb 'foliage'
lombkorona 'foliage of a tree'
lopj 'steal! (indefinite)'
löszt 'yellow soil (acc)'
MAFC <acronym>
majd 'later'
Majs <proper noun>
Márta 'Martha'
Mátra <proper noun>
meggy 'sour cherry'
mered 'protrude (pres 3rd sg indefinite)'
meredés 'protrusion'
mnemonika 'mnemonics'
mond 'say (pres 3rd sg indefinite)'
mondj 'say! (indefinite)'
most pedig 'and now'
naponta 'daily'
nedv 'juice'
nefelejcs 'forget-me-not'
nemz 'beget (pres 3rd sg indefinite)'
nézd 'look! (definite)'
nézz 'look! (indefinite)'
nganaszán 'Nganasan'
nincs 'do(es) not exist'
nyelv 'language'
nyom 'push (pres 3rd sg indefinite)'
nyomd 'push! (definite)'
nyomj 'push! (indefinite)'
nyomsz 'push (pres 2nd sg indefinite)'
obskurus 'obscure'
öld 'kill! (definite)'
ölts 'wear! (indefinite)'
olvadt 'molten'
ölyv 'hawk'
orom 'summit'
öröm 'joy'
orr 'nose'
ostrom 'siege'
ösztrogén 'oestrogen'
ott 'there'
pad 'bench'
pajzs 'shield'
paraszt 'peasant'
páratlan 'unparalleled'
park 'id.'
partner 'partner'
pátens 'letter'
pech 'bad luck'
perec 'pretzel'
perem 'edge'
perm 'Permian period'
plakát 'poster'
plankton 'plankton'
pneumatikus 'pneumatic'
polc 'shelf'
polctól 'from the shelf'
pötty 'dot'
prém 'fur'
pszichológus 'psychologist'
ptózis 'ptosis'
pünkösd 'Whitsun'
rajz 'drawing'
rakj 'put! (indefinite)'
raksz 'put (pres 2nd sg indefinite)'
recept 'receipt'
Recsk <proper noun>
reform 'id.'
rend 'order'
retek 'raddish'
retektől 'from (the) raddish'
retkek 'raddishes'
rezg 'vibrate (pres 3rd sg indefinite)'
rí 'weep (pres 3rd sg indefinite)'
ring 'sway (pres 3rd sg indefinite)'
ringló 'plum'
rivalg 'blare (pres 3rd sg indefinite)'
rívok 'weep (pres 1st sg indefinite)'
rongy 'rag'
röntgen 'X-ray'
sakk 'chess'
scsí <Russian soup>
skorpió 'scorpion'
slejm 'phlegm'
slussz 'finished'
smaragd 'emerald'
smink 'makeup'
snassz 'passé'
sör 'beer'

söröcske 'little beer'
sors 'fate'
spektrum 'spectum'
sport 'id.'
sróf 'screw'
stáb 'staff'
stílus 'style'
stop 'stop!'
stramm 'healthy and strong'
sünt 'hedgehog (acc)'
Svájc 'Switzerland'
svéd 'Swedish'
szaft 'sauce'
Szakcs <proper noun>
szánj 'have pity! (indefinite)'
szanszkrit 'Sanskrit'
szárny 'wing'
szcéna 'scene'
szem 'eye'
szerb 'Serb'
szerbtől 'from (a) Serb'
szex 'sex'
szféra 'sphere'
szfinxet 'sphinx (acc)'
szkíta 'Scythian'
szláv 'Slav'
szmog 'smog'
sznob 'snob'
sző 'weave (pres 3rd sg indefinite)'
szobor 'sculpture'
szobortól 'from (the) statue'
szobrok 'statues'
szomj 'thirst'
szörny 'monster'
szörp 'soft drink'
szövök 'weave (pres 1st sg indefinite)'
szpícs 'speech'
sztár 'star'
sztyepp 'steppe'
szurony 'bayonet'
szvetter 'sweater'
talp 'sole'
taps 'applause'
tárgy 'object'
tart 'hold (pres 3rd sg indefinite)'
tarts 'hold! (indefinite)'
táts 'open! (indefinite)'
tátsd 'open! (definite)'
templom 'church'
terem 'grow (pres 3rd sg indefinite)'
teremt 'create (pres 3rd sg indefinite)'
teremts 'create! (indefinite)'
testnevelés 'Physical Education'
több 'more'
tömzs 'lode'
torony 'tower'
törzs 'trunk'
tréfa 'joke'
treff 'clubs'
trencskót 'trench coat'
tromf 'trump'
turf 'id.'
tviszt 'twist'
ujj 'finger'
uszkve 'approximately'
vádli 'calf (of leg)'
vágysz 'desire (pres 2nd sg indefinite)'
vánszorog 'crawl (3rd sg indefinite)'
várd 'wait! (definite)'
várj 'wait! (indefinite)'
végre 'at last'
vers 'poem'
versláb '(metrical) foot'
versz 'beat up (pres 2nd sg indefinite)'
vésd 'etch! (definite)'
vicc 'joke'
vlach 'Walachian'
vödör 'bucket'
vödörtől 'from (the) bucket'
vödrök 'buckets'
voks 'vote'
vonz 'attract (pres 3rd sg indefinite)'
xilofon 'xylophone'
zlotyi <Polish currency>
zrí 'trouble'

References

Ács Péter & Siptár Péter (1994) "Túl a gondozott beszéden", in Ferenc Kiefer (ed.) *Strukturális magyar nyelvtan 2. Fonológia,* Budapest: Akadémiai Kiadó. pp. 550-580.

Bagemihl, Bruce (1991) "Syllable structure in Bella Coola", *Linguistic Inquiry* 22. pp. 589-646.

Bárczi Géza, Benkő Loránd & Berrár Jolán (1967) *A magyar nyelv története*, Budapest: Tankönyvkiadó

Blevins, Juliette (1995) "The syllable in phonological theory", in John Goldsmith (ed) *The Handbook of Phonological Theory* Oxford: Blackwell

Borowsky, Toni (1989) "Structure Preservation and the Syllable Coda in English", *Natural Language & Linguistic Theory* 7.2 pp. 145-166.

Burzio, Luigi (1994) *Principles of English Stress*, Cambridge: Cambridge University Press

Charette, Monique (1991) *Conditions on Phonological Government*, Cambridge: Cambridge University Press.

Clements, George N. and Samuel J. Keyser (1983) *CV Phonology: A Generative Theory of the Syllable*, Cambridge, Massachusetts: MIT Press

Cyran, Eugeniusz & Edmund Gussmann (1996) "Consonant clusters and governing relations: Polish initial sequences", Lublin: Catholic University of Lublin ms.

Davis, Stuart (1990) "The Onset as a Constituent of the Syllable", *CLS* 26. pp 71-81.

Dressler, Wolfgang & Siptár Péter (1989) "Towards a natural phonology of Hungarian", *Acta Linguistica Hungarica* 39. pp. 29-51.

Fudge, Erik (1969) "Syllables," *Journal of Linguistics* 5, pp. 193-320.

Giegerich, Heinz, J. (1992) *English Phonology: an Introduction,* Cambridge: Cambridge University Press

Harris, John (1994) *English Sound Structure*, Oxford: Blackwell

Hayes, Bruce (1981) *A Metrical Theory of Stress Rules,* Cambridge, Mass.: MIT Ph.D. dissertation. Published by Garland Press, New York, 1985.

Hayes, Bruce (1989) "Compensatory Lengthening in Moraic Phonology", *Linguistic Inquiry* 20, pp. 253-306.

Hyman, Larry (1985) *A Theory of Phonological Weight*, Dordrecht: Foris.

Itô, Junko (1986) *Syllable Theory in Prosodic Phonology,* Amherst: University of Massachusetts Ph.D. dissertation. Published by Garland Press, New York, 1988.

Kahn, Daniel (1976) *Syllable-based Generalizations in English Phonology*, Cambridge, Mass.: MIT Ph.D. dissertation. Published by Garland Press, New York, 1980.

Kálmán László (1985) "Inflectional Morphology", in Kenesei István (ed) *Approaches to Hungarian I: Data and Descriptions,* Szeged: JATE pp. 247-262.

Kaye, Jonathan (1990) "'Coda' Licensing", *Phonology* 7, 301-330.

Kaye, Jonathan (1992) "Do you believe in magic? The story of *s+C* sequences", *SOAS Working Papers in Linguistics and Phonetics* 2. pp. 293-314.

Kaye, Jonathan (1995) "Derivations and interfaces", in Jacques Durand and Francis Katamba (eds) *Frontiers of Phonology: Atoms, Structures, Derivations*, London: Longman

Kaye, Jonathan, Jean Lowenstamm and Jean-Roger Vergnaud (1990) "Constituent Structure and Government in Phonology", *Phonology* 7, 193-231.

Kornai András (1990) "Hungarian Vowel Harmony," in Kenesei István (ed) *Approaches to Hungarian III: Structures and Arguments,* Szeged: JATE pp. 183-240.

Kornai András (1994) *On Hungarian Morphology* (Linguistica, Series A: Studia et dissertationes, 14.) Budapest: MTA Nyelvtudományi Intézet

Nádasdy Ádám & Siptár Péter (1994) "A magánhangzók", in Kiefer Ferenc (ed.) *Strukturális magyar nyelvtan 2. Fonológia,* Budapest: Akadémiai Kiadó. pp. 42-182.

Nespor, Marina & Irene Vogel (1986) *Prosodic phonology,* Dordrecht: Foris

Olsson, Magnus (1992): *Hungarian Phonology and Morphology* (Travaux de l'Institut de Linguistique de Lund 26.) Lund: Lund University Press.

Papp Ferenc (1975) *A magyar főnév paradigmatikus rendszere,* Budapest: Akadémiai Kiadó.

Prince, Alan and Paul Smolensky (1993) *Optimality Theory: Constraint Interaction in Generative Grammar,* ms., Rutgers University, New Brunswick, and University of Colorado, Boulder

Rebrus Péter (1996) *Optimalitás a fonológiában: morfonológiai jelenségek a magyarban,* Budapest: ELTE MA dissertation

Ritter, Nancy (1995) *The Role of Universal Grammar in Phonology: A Government Phonology Approach to Hungarian,* New York: NYU Ph.D. dissertation.

Rubach, Jerzy & Geert Booij (1990) "Edge of Constituent Effects in Polish", *Natural Language and Linguistic Theory* 8. pp. 427-463.

Siptár Péter (1993) "Marginalia in Hungarian phonology", *Eurasian Studies Yearbook* 65. pp. 73-84.

Siptár Péter (1994) "The vowel inventory in Hungarian: its size and structure", *The Even Yearbook,* Budapest: ELTE pp. 175-184.

Steriade, Donca (1982) *Greek Prosodies and the Nature of Syllabification,* Doctoral dissertation, MIT, Cambridge, Massachusetts.

Törkenczy Miklós (1992) "Vowel-zero alternations in Hungarian: a government approach", in Kenesei István & Pléh Csaba (eds) *Approaches to Hungarian IV: The Structure of Hungarian,* Szeged: JATE pp.157-177.

Törkenczy Miklós (1994) "A szótagszerkezet", in Kiefer Ferenc (ed) *Strukturális magyar nyelvtan, 2. kötet: Fonológia,* Budapest: Akadémiai Kiadó pp. 272-392.

Törkenczy Miklós (1995) "Underparsing and Overparsing in Hungarian: an Optimality Analysis", in Kenesei István (ed) *Approaches to Hungarian V: Levels and Structures,* Szeged: JATE pp. 323-340.

Vago, Robert M. (1980) *The Sound Pattern of Hungarian,* Washington: Georgetown University Press

Vago, Robert M. (1989) "Empty consonants in the moraic phonology of Hungarian", *Acta Linguistica Hungarica* 39. pp. 293-316.

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