DO CITE

VC Phonology:
a theory of consonant lenition and phonotactics

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CONTENTS

PREFACE

The aim of the present dissertation is to make a contribution — modest as it may be — to the development of a working model of phonological representation. Following the mainstream, I take the autosegmental framework as a given. I will argue that unary features are more adequate in representing melodic oppositions than binary or scalar features. A very limited type of skeletal structure will be assumed, strictly alternating C and V positions, laying the burden of expressing syllable structure on the relationships between these positions. The two relationships involved are licensing and government, with a novel definition introduced for the latter, both of which are local and unidirectional forces. I will show that there is much to gain by repartitioning the skeleton, that is, by claiming that it is made up not of CV units — as all researchers who accept this minimal representation assume — but of VC units. I am also going to examine branching onsets, with the result that these consonant clusters are in many respects similar to those created by syncope in English, especially word-medially, but no firm conclusions will be reached here. The evolving theory will be shown at work in predicting the sites where lenition occurs and its direction too, as well as in explaining phonotactic restrictions affecting consonant clusters. Finally, I will outline some basic assumptions that appear to be important in devising a theory of melodic representations, without taking this last enterprise to an end.◃ 1

▹ version of **30/11/99** Paragraph numbering is retained from previous versions. This text is "frozen". Typos are welcome and included in later printouts. Comments on content are even more welcome, but will not be considered in corrected versions of *this* text.

The ultimate goal of linguists is to capture the essence of natural language, that is, to construct models that not only describe the way language works, but also provide theoretically plausible explanations for why things could not be otherwise. This, of course, is not an easy goal, in fact, it probably is an ideal craved for but never to be attained. It is common knowledge that the most fruitful method of approaching this goal is to posit very few axioms and locate the set of phenomena that cannot adequately be accounted for by these. Only as a last resort should 2 new presuppositions be accepted. It follows from this method that there are always bound to be things which the theory cannot predict or which it predicts to be nonexistent. The desirable state of affairs is one in which it is the infrequent things that stick out, while the everyday phenomena are easily accounted for. Thus the fact that a certain theory is unable to provide an obvious means of dealing with, say, branching onsets can even be seen as a merit, given that the existence of word-initial rising sonority clusters (to the exclusion of falling sonority clusters) is quite a unique property of a subset of human languages. There always remain fuzzy edges in theories; locating the problem cases, not trying to incorporate them into the set of explainable phenomena by all means is often the best one can do.

One of the main principles underlying the theory I am developing **3**
in this thesis is theoretical minimalism. I try to reduce the conceptual machinery to as little as possible. Such gambles always involve some give-and-take; by reducing syllabic constituency there will inevitably emerge an intricate system of relationships between skeletal positions; by reducing the number of primes, the interpretative conventions are bound to become more complex. It is often useful to take such risks if only to experiment with the extremes: some insightful observations can occasionally be made this way.

Most of the natural language data I present in this theory are from **4**
English, the theoretical claims ought, nevertheless, to be applicable to other languages too. Some parametric regularities are noted, but the task of testing the theory, tailored by and large for English, against further systems is one I do not undertake here.

Throughout the thesis I use the symbols of the IPA to indicate **5**
the melodic content of strings. To highlight the characters somewhat I typeset them with a sans serif font, which also makes enclosing brackets or solidi unnecessary. The sometimes arcane paragraph numbering is to help those who possess the previous version of this text and also to ease internal referencing.

1 EMPTY POSITIONS IN THE SKELETON

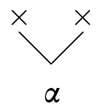
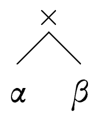
One of the most important achievements of modern linguistics is the dis- 6
covery of the use of emptiness. Its relevance can be likened to that of the concept of zero, without which it is hard to imagine the progress natural sciences have made in the last few centuries. The aim of the discussion that follows is to convince the reader that empty positions in the phonological skeleton are not merely a tricky device to ease the analysis, but rather a logical conclusion of various different lines of thought pursued by theorists of modern phonology.

The chapter is structured in the following way: section **1** shows that 7
the widely accepted autosegmental framework of phonological representations calls for the recognition of melodiless points on the skeletal tier, i.e., empty positions are a logical conclusion of autosegmental phonology. In an excursus in section **2** on the competing models of representing melody, I argue for the theoretical desirability of unary features, as opposed to scalar and binary features, and show why such a framework again necessitates the acceptance of empty segments, i.e., skeletal points without melodic content. Then, in section **3**, the theoretical status of empty skeletal points is discussed: I claim that it is only a question of scholarly tradition that many phonologists believe the null hypothesis to be a skeleton where only the pronounced segments are furnished with a slot.

1.1 The skeleton–melody relationship

A not so recent advancement in phonological theory is the recognition of 8
the necessity of separating the quantitative and the qualitative aspects of segments. In this line of research, first called prosodic, later reinvented as autosegmental phonology, the quantitative aspect is represented by a so-called skeletal tier, the qualitative by the melodic tier. The exact content of these two tiers is one of the most important issues of current research. The relationship between the elements of the two tiers is negotiated by association lines.

With the advent of the autosegmental model, it becomes neces- 9
sary to explore the consequences of non-biunique relationships between the two. Having one batch of melody defining primes associated to two skeletal positions is the best-known and probably least controversial option, standardly employed to represent some acoustic property stretching across multiple timing slots (1a). The realization of this configuration ranges from long vowels (aː) and some diphthongs (ei), through genuine geminate consonants (tː), to partially identical clusters, like adjacent monomorphemic homorganic consonants (mb). The complementary configuration—two pieces of melodic material linked to the same skeletal position—is also a common thing, given that sounds are usually thought of as composite entities (1b). (The Greek letters represent melodic primes.)

(1) a.  b. 

It is important to note that (1b) cannot be the representation of an 10
affricate or pre-/postnasalized stop, of a so-called contour segment. Such an interpretation would require an unwarranted distinction between the representations of (2) and (1b).

(2) 

Although there is a graphical difference here — the β of (2) is associated 10a
to the skeleton through α, while in (1b) the two primes are mutually independent of each other — this is not often utilized: Harris (1990 : 270) represents affricates similarly to (1b), but what he means only becomes obvious with the introduction of feature geometry (in Harris 1994 : 131). In Szigetvári 1998b I make use of a dependent feature like (2), associating the [voiced] (β) feature indirectly, through [obstruental] (α) to the skeleton, with the prediction that in absence of the latter segments may not be specified for [voiced]. I return to the problem of contour segments in section **8.4**.

Association of melodic material and skeletal slots includes not only 11
one-to-two, but also one-to-three, one-to-four, etc., associations (3a). What is intriguing is that while such configurations obviously exist — vowel harmony and tone phenomena very often exemplify unbounded spreading of melodic material through longer skeletal strings —, three-long consonants (tːː) or vowels (aːː) (allegedly present in, for example, Estonian) are standardly explained away, analysed in such a way that does not involve a structure like the one in (3a) and supposed to be non-contrastive even if phonetically existent. Later (in sections **4.6.1**, ¶169, and **4.6.2**, ¶177), we are going to see an explanation for this constraint in natural language. The situation in (3b) is again well-attested.

(3) a. b.

Two further options that deviate from the boring one-to-one rela- 12
tionship are available in an autosegmental model. One is melodic material without an associated skeletal slot. Such floating segments are very useful in handling alternations where in what looks like the base form of a word there is nothing to indicate the presence of melodic material surfacing in some other, oblique form. This option is used, for example, by Kenstowicz & Rubach (1987) in their analysis of yers in Slovakian. The phonetic identity of a realized yer is usually predictable in Slavic languages, but in Slovakian the decisive factor, the palatalization of surrounding consonants, is lost, rendering the quality of the surfacing yer unpredictable. Another alternation of this type is liaison, which is especially intriguing when there exist other words with phonologically similar base forms which fail to manifest the same alternation. Such is the case

in, for example, the textbook RP[1] *grammar is* græmə r ɪz vs. *gamma is* gæmə ɪz, where the base forms are græmə and gæmə, respectively. The presence of the r in the first but not in the second case is neatly explained by assuming that græmə is lexically furnished with an r that lacks (or is unassociated to) a skeletal slot, while gæmə has no r of any kind, as shown in (4).

```
(4) a.  ×   ×   ×   ×   ×          ×   ×   ×
        |   |   |   |   |              |   |
        g   r   æ   m   ə   r          ɪ   z

    b.  ×   ×   ×   ×       ×   ×   ×
        |   |   |   |           |   |
        g   æ   m   ə           ɪ   z
```

Such an account avoids the use of brute force deletion, i.e., maintains **13**
monotonicity (cf. Kálmán 1989), to explain the failure of the r to surface in case no vowel-initial string follows (e.g., *grammar book* græmə bʊk). It also presupposes that phonetic interpretation proceeds on the skeleton, realizing those and only those portions of the melody that are associated with the skeleton. If the mere presence of melodic material in the representation were enough for its being phonetically interpreted the option of unpronounced floating melody would not be viable.

The complementary situation is obviously a skeletal slot without **14**
any melodic content associated to it. This configuration comes handy again in dealing with liaison phenomena: for the floating liaison consonant to be interpreted it must be linked to a skeletal position. Since such consonants are typically pronounced only if a vowel-initial word (or suffix) follows, all that need be hypothesized is that such words carry a skeletal slot at their beginning which is not associated to any melodic material lexically, like at the beginning of *is* ɪz in (4). The floating melody thus has a chance to associate and hence get interpreted. Though this account appears elegant at first sight, there is some theoretical difficulty with it. If the phonetic interpreter takes consecutive skeletal positions as

[1] This dialect is sometimes claimed to be nonexistent outside prescriptively biased books on English pronunciation (Harris 1994 : 293, note 5), though Jones, for example, claims he has had this dialect (1967 : xxvii). Whatever its reality, it illustrates the case in point.

its input and realizes whatever melody is linked to each, one may wonder what should happen when it encounters a position to which no melody is associated. This problem brings us to query the nature of melodic primes, which is exactly what we are going to do in the next section.

1.2 The representation of melody

15 Western writing systems segment the continuous flow of the speech signal quite uniformly as regards segment size, consequently disputes of what constitutes one or two units are much less common — though not unheard of — than disputes about the domains of larger (syllable, foot) and smaller (subsegmental) units. A more robust segmentation, e.g., into chunks of the size of what is called the syllable, would ignore the fact that these units are recurrently made up of the same types of parts: syllable beginnings are by and large freely combinable with syllable endings (i.e., ta ti tu and ta ma sa are usually all possible in a given language). Therefore, a framework not analysing syllables into smaller segments would face a significant loss in economy. But it is also evident that the traditional segments labelled by the letters of the alphabet are not atomic: for one thing, phonological processes manipulate parts of these segments independently of the rest, for another, sets of segments recurrently pattern together in all sorts of different languages. Take voice assimilation, for example: in many languages two adjacent obstruents come to agree in voicing. In doing so one of them loses its own voicedness or voicelessness and assumes that of the other. For this reason, the analyst must posit voicedness and voicelessness as properties of segments distinct from the rest. Furthermore, obstruentness must be capturable, there must be something in common in all obstruents. Like voicing/voicelessness, place of articulation and many stricture properties also exhibit independent behaviour, leading phonologists to see segments as being made up of smaller subcomponents.

16 The representatives of sound properties are standardly referred to as features. Features usually come in one of two flavours: either as standalone units that indicate a property by being present in the representation — these are called unary[2] features —, or as ordered pairs consisting of a feature and its value. The latter, more complex type has two subtypes, binary features, which can have one of two values, usually marked

[2] Unary, as if they had one value, but these are in fact valueless.

'+' and '−' and scalar features, which can characterize the prominence of the given property with greater precision, typically marked by integers (e.g., 0VOICE, 1VOICE, 2VOICE, … *n*VOICE).

1.2.1 Scalar versus binary/unary features

The theoretical difference between scalar features on the one hand and binary and unary features on the other is obvious: the former allows a theory to express much more subtle distinctions in the dimension of a certain phonological property than the latter two. There is, however, not very much need for such subtle distinctions: oppositions in natural language are overwhelmingly binary, that is, a property is either present in an expression or absent, there is hardly ever any need to make reference to more than two values of a feature.[3] This is not to say that a language may not have more than two degrees of, say, voicing on the surface, but as regards their phonological behaviour segments with a lesser or greater degree of voicing will always line up with one or the other pole, a given segment will always behave as either voiceless or voiced. Those cases which appear to call for a scalar feature analysis certainly do not immediately warrant the introduction of such objects. Because they are so powerful, one has to show first that scalar features are absolutely unavoidable, that they cannot be replaced by the simpler binary or unary features. **17**

This manner of arguing for the rejection of scalar features may reasonably provoke an attack on the tacit assumption behind it: why should features be of the same type? Why could we not have some scalar, some binary and some unary features in our theory? Lass (1984 : 102f) asks these questions and calls the kind of stance I take here "the atomic fallacy." He puts it down primarily to Jakobson's and Chomsky & Halle's "cognitive" or "psycholinguistic" bias. While this may be true historically, I have the impression that mere theoretical elegance adequately justifies the desire that the primitives of a theory be uniform. Furthermore, the simpler the primitives, the more plausible they are. A unary feature is obviously simpler than a binary or a scalar feature in that it is one bit of information, while the others are two: the feature name and its value. Occam bears witness to categorial uniformity too: it is not **18**

[3] As we are going to see in section **5.3**, ¶233, as well, natural language is unable to count, i.e., all it is sensitive to is whether something exists or not.

only the number of categories but also the number of types of categories that must not be multiplied in vain.

1.2.2 Binary versus unary features

Returning to a theoretical comparison of the types of phonological primes 19
that have been suggested, we are left with unary and binary features as possible candidates. To illustrate the difference between them let us consider the way they express the voiced–voiceless contrast typically exhibited by obstruents. If we represent the segment that is the common denominator of both [t] and [d] as T,[4] i.e., an expression from which has been deprived of laryngeality, then in a binary framework [t] will be {T,−VOICE}, while [d] will be {T,+VOICE}. The typical unary framework has [t]={T} and [d]={T,VOICE}. The most conspicuous difference between the two approaches is that with binary features the number of units present in the representation of [t] and [d] is equal, while with unary features one of the contrasting segments ([t] in the case examined[5]) contains one unit less. Since usually there is no special theoretical relevance attributed to the feature values in binary frameworks, i.e., −VOICE and +VOICE are theoretically equivalent to +VOICELESS and −VOICELESS, respectively, this theory does not distinguish between the status of [t] and [d] in a given system. Consequently, in a feature theory containing only binary features privative oppositions are inexpressible as such, every opposition will appear as equipollent. Nevertheless, privative and equipollent oppositions may be modelled by a binary feature framework. In a privative opposition the value of only one feature is different in the two parties, if more than one feature values differ we face an equipollent opposition.

At this point, there appears to be no difference between the con- 20
trastive capacity of a unary and a binary feature: both types can distinguish two objects. With the introduction and rather general acceptance of underspecification theories (e.g., Kiparsky 1985, Archangeli 1988, etc.) the situation has changed radically. If a feature is allowed to have no

[4] This symbol probably reminds the reader of the Trubetzkoyan archiphoneme. It is indeed similar in certain respects, but must not be equated with it. One may think of it as an underspecified segment, like the Firthian phonematic unit.

[5] It must be noted that [t]={T,VOICELESS}, [d]={T} is also viable, though less often argued for.

value in addition to having its two explicit values, analysts will soon be using it with three distinct values: $\emptyset$VOICE, +VOICE and −VOICE, as Stanley (1967 : 409ff) notes. Various proposals have been put forward to manage this problem. Constraining underspecification to cases when the missing feature value is predictable or nondistinctive (or both) still makes the filling in of default feature values necessary and, in addition, in some cases the fill-in rule and other phonological rules have to be extrinsically ordered.

The force driving underspecification is lexical minimality: “under- **21**
lying representations must reduce to some minimum the phonological information used to distinguish lexical items” (Steriade 1995 : 114). Not assigning any value to certain features in the lexical representation is believed to lessen the burden of the memory. The same move, however, increases computation time and the direction the balance is tilted in is far from being obvious (Harris & Lindsey 1995 : 47f). Underspecification captures the insight that the two values of a feature are usually in an asymmetrical relationship. The problems with this approach stem from the obsession with full specification, the idea that “the output of the phonological component must contain fully (or at least maximally) specified feature matrices” (Steriade 1995 : 114). To take an example, in many languages sonorants only occur as voiced; this fact is encoded in the representation by not assigning any value to the VOICE feature. Underspecification theories nevertheless will require that sonorants get the ‘+’ value for the VOICE feature during the derivation, even though this property is irrelevant for sonorants even at the surface. The voicing of sonorants is invisible for phonology throughout the derivation up to the point where the default rule fills in the value. If the filling-in process is allowed to occur before other phonological rules, i.e., rules may refer to the default value of the VOICE feature in sonorants, the theory faces the danger of serious overgeneration. If it must be the last step of the derivation, one wonders why have it at all.

1.2.3 Unary features

A decisive step, taking underspecification to its logical conclusion, is to dispense with fill-in rules altogether. Returning to the previous example, this would mean not specifying sonorants for voicing at all.[6] The significance of applying such features throughout the representation is the fact, already noted, that a privative phonological opposition is now represented by two segments one of which has one feature less than the other. Since unary features typically represent the marked value of the given opposition, the segment comprising n features will be more marked than the one comprising $n-1$ features. There will be found segments that are even less marked, comprising $n-2$, $n-3$, ... features; eventually we arrive at a very unmarked segment that is represented by a single unary feature. It will at this point be justified to say that the given feature is not an abstract phonogical entity, but a concrete physical phenomenon, the sound it is used to represent.[7] A basic claim of the mainstream theories, that sounds are not atomic, has to be modified: some sounds are not atomic, but can be analysed as the combination of other less complex sounds. But the ultimate building blocks of sounds are themselves sounds, which are, in fact, atomic. This idea features very strongly in Government Phonology, especially in Harris 1996 and Harris & Lindsey 1995. **22**

Single-feature segments are still marked: each feature is a mark. They form privative oppositions with two-feature segments on the one hand, and with the featureless segment on the other. The interpretation of the featureless segment must be the acoustically most unmarked segment, which, however, may not coincide with the segment most often occurring cross-linguistically. It very often occurs in language that the **23**

[6] Three objections come to mind that could be raised against such a proposal: (i) how will the phonetic interpreter know that sonorants are pronounced with vocal fold vibration?; (ii) how come some sonorants seem to spread voicing?; (iii) how can some languages contrast voiced and voiceless sonorants? I address these questions in a later section **8.1** (also cf. Szigetvári 1998a : 227f) for now let us simply assume that they can be dealt with.

[7] This is so unless the representation of a segment contains more than features and association lines linking them to a skeletal position. Such objects — root nodes, feature geometries of various flavours etc. — are often assumed in other theories, but disregarded here.

most common expressions do carry some mark to ease perception — languages that utilize vowels sparingly typically have i a u or i e a o u, but not the totally unmarked ə or ɯ.

We can conclude that it follows from a model having exclusively 24
unary features that empty segments, i.e., skeletal positions unassociated with any melodic material, ought to exist, furthermore they must be phonetically interpretable.[8]

1.3 Empty skeletal positions and the null hypothesis

One way of classifying current phonological theories is by the criterion 25
whether they allow skeletal positions to be empty or not. The stance one adopts in this issue is of substantial relevance to the whole of a given theory. There are several questions that the existence or nonexistence of empty skeletal positions bears upon. To mention but a few: the association of segments in phonological strings to syllabic constituents will be seen radically differently if empty positions may occur and cases of segments alternating with zero must also be analysed differently if we are reluctant to accept that a skeletal position may be empty: the destructive, non-monotonous device of resyllabification is very often called for if one wishes to have only positions with melodic content on the skeleton.

Taking the first case, let us assume the conventional syllable struc- 26
ture comprising an onset, a nucleus and a coda. In the standard textbook account all three constituents come with a practically unbounded branching potential, i.e., the onset in English may contain 0–3, the nucleus 1–2 and the coda 0–5 segments (e.g., Giegerich 1992 : 153, 167). Being empirically correct this analysis fares well for a description but is unusable when searching for an explanation; the number of branches for each constituent ranges within patently stipulative limits. One wonders why the onset may contain up to three segments, what inhibits it from having, say, four. The tacit assumptions behind this analysis are the axioms that syllable boundaries necessarily coincide with word boundaries[9] and that

8 Péter Dienes (*voce*) points out that this does not follow. Indeed, the matter depends on the meaning of skeletal slots, whether they represent a segment of the speech flow or a more abstract notion which may be interpreted as silence as well.

9 E.g., Blevins 1995 : 209: "In all languages, syllable edges correspond with word/ utterance edges. . . "

segments are fully integrated into the prosodic hierarchy, that is, each segment belongs to some syllabic constituent, each syllabic constituent belongs to some syllable and so on. The unfoundedness of the first axiom becomes apparent if we consider that on another level of the prosodic hierarchy, that of feet, boundaries do not necessarily coincide; words may begin with a degenerate foot and may end with a sole stressed syllable, which is not usually referred to as a degenerate foot, it still lacks a dependent second syllable. The second axiom, full integration of segments, has to be given up by theorists following this line as soon as it is realized that word edges tolerate a wider range of phonotactic freedom,[10] and to handle such phenomena the notion of extrasyllabicity has to be introduced.[11]

There is yet another reason why Giegerich's (or other analysts' similar) constraints are spurious theoretically: while the two consonantal constituents, the onset and the coda may be empty, i.e., they may contain zero segments, the same possibility is not available for the vocalic portion of the syllable, the nucleus. The excuse that may be brought up to explain this discrepancy is the head status of nuclei; as the head of the syllable they must not be empty. Again, if we move to other levels of the prosodic hierarchy the situation is different: both headless feet and headless segments[12] are possible. **27**

As for segment–zero alternations, we have already seen a case where hypothesizing an empty skeletal position facilitates the analysis: liaison phenomena are neatly describable by positing an empty consonantal position before vowel-initial words. To take another instance, this time a vowel alternating with zero, consider the onset m of the unsyncopated fæməli, which becomes a coda in the bisyllabic fæmli. A similar but converse situation often arises with morphological concatenation, e.g., the coda l of *tell* becomes an onset in *telling.* Both of these cases involve resyllabification in theories that want to maintain that prevocalic **28**

[10] If syllables in English could in fact begin with three consonants and end in five, we would expect eight-consonant-long intervocalic sequences within words, but this also turns out to be a disappointed expectation.

[11] E.g., Goldsmith 1990 : 123: "*prosodic licensing,* which require[s] that all elements be a member of some syllable, or else be marked as contingently extrasyllabic."

[12] The head–nonhead distinction in segments is not universally accepted, but cf. Anderson & Ewen 1987, Kaye & al. 1985, Schafer 1995, among others.

consonants are in an onset, but reject the possibility of having empty skeletal positions. Resyllabification, however, subverts the result of core syllabification, thereby representing a serious challenge to phonological parsing: if in a framework it is allowed that the syllabic status of elements be freely changed during the derivation, the possibility of tracing back the derivation, getting from the surface signal to the underlying representation, reduces radically.[13] 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, codas have no theory-external status, 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. If one wants to avoid applying resyllabification, the alternative analysis of segment–zero alternations and morphological concatenations will involve empty skeletal positions.

What apparently justifies theories of the skeleton that reject the **29**
possibility of empty positions is the assumption that this is the null hypothesis. That is, empty skeletal positions ought not to be posited unless there is no other way to analyse phonological phenomena. While it is true that accepting skeletal positions that fail to be interpreted phonetically does bring some abstractness into a theory, it is controversial whether their rejection *is* the null hypothesis. The generative power of a theory having syllables of an unlimited size may be just as excessive as that of one having empty skeletal positions, what matters is whether there are adequate means of curtailing the possibilities.

I will now argue against this, aiming to show that the prevalent view **30**
rejecting empty positions is somewhat accidental, relying on tradition. Let us imagine that modern phonological theory happened to be developed by people who spoke languages like Desano or Zulu, in which phonological domains are exclusively CVCV. . . CV on the surface. If they spoke about syllables at all, these phonologists would surely claim that syllables have the structure CV — or onset–nucleus, for us, Indo-European

[13] It was for similar considerations that Chomskyan syntax has abandoned the device of MOVEMENT, replacing it with the notion of CHAINS.

phonologists. After encountering more complex languages like Luo or Krenak, which allow consonants word-finally, or others like Japanese, which allow certain types of consonant clusters word-medially, it is far from obvious that our hypothetical phonologists would extend their syllable template by adding a further optional C position at the end. It is just as likely that they would hypothesize an empty V position between the two consonants or after the word-final one. In fact empirical evidence exists for the latter assumption: Harris & Gussmann (1998 : 141) claim that all syllabic writing systems assign such offending consonants to an independent syllable with an uninterpreted vowel (dummy syllables as Harris & Gussmann refers to them). Now one may argue that this is so for reasons of economy: one needs much less new symbols for the vowelless syllables—the number of all consonants in the worst case, but coda consonants are typically only a small subset of all consonants in a given language—, while, again in the worst case, the number of all CV syllables (maximally $C \times V$, where C is the number of consonants and V of vowels in the language) would be multiplied by the number of coda consonants if CVC symbols were introduced, i.e., for each of the hypothetical *ta, sa* and *ma* symbols we would need as many new symbols as there occur coda consonants with them. Although this graphical economy is not a linguistic argument, one also has to admit that economical considerations do feature in scientific theories, too, as noted by Occam quite a while ago, furthermore, once dummy syllable symbols are used literate people will unavoidably analyse their language as having empty vowels at certain points in phonological strings and phonologist will follow this tradition and, more importantly, they will take it to be the null hypothesis.

I hope to have shown that while the acceptance or otherwise of 31
empty skeletal positions appears to be a matter of scholarly taste (analyses applying both approaches abound, after all), laying the burden of proof on theories with empty positions thinking that we have the null hypothesis on our side is not right after all. What the null hypothesis is in this issue is most probably a question of tradition.

2 SYLLABLE STRUCTURE

Many current theories of phonological representation assume one or more levels between feet and the skeleton in the prosodic hierarchy. These are occupied by so-called syllabic constituents which organize skeletal positions and other syllabic constituents into syllables. Syllabic constituents gain theoretical relevance when they prove to be indispensable in—or at least result in a substantial simplification of—the formulation of phonological generalizations. 32

Syllables, on the other hand, are not uncontroversial entities. The notion has been abandoned several times in the history of phonological theory, the best known case is probably that of the SPE (Chomsky & Halle 1968). From the 1970s mainstream phonology has gradually returned to applying this traditional concept, but interestingly in most cases[14] it is not the syllable constituent itself that is necessary for the analyses, but its subconstituents, the onset, the nucleus and the coda. 33

In this chapter I survey different theories of syllable structure beginning with the standard argument for having syllables (section **1**). After discussing some widespread ideas of parsing phonological strings into syllables and pinpointing some problems with these methods in section **2**, I will introduce a framework that aims at solving them by positing empty positions in the skeleton (section **3**). Section **4** collects arguments brought up in favour of codas and aims at refuting the necessity of each. In section **5,** we are going to arrive at the most restrictive syllabic framework possible, CVCV phonology, and the last section (**6**) collects some further arguments against syllabic constituency of any kind. 34

[14] Reduplication may appear be an exception, though here again it is often not a syllable that is repeated, but the *head* of the first onset and the following nucleus (Brockhaus 1995 : 215ff).

2.1 Why have syllable structure?

It has been noticed — e.g., by Kahn (1976) — that certain consonantal processes favour the phonological environment depicted in (5). 35

(5) $$\_\left\{\begin{array}{c}\mathrm{C}\\ \#\end{array}\right\}$$

If syllables have a theoretical status, the environment in (5) can simply be referred to as the end of the syllable, i.e., its coda. There are two problems with this formula: first, it is not true that all preconsonantal consonants exhibit coda-like behaviour, for example, we find glottalization in an English word like *A*[$^{\text{ʔ}}\text{t}$]*lantic* but aspiration in *a*[t^{h}]*ractive,* although the t is preconsonantal in both cases. Thus it seems that syntagmatic relationships in the string of segments are not in themselves enough to properly capture phonological environments. Second, even if they were so, the formula in (5) makes use of an unnatural disjunction: there is nothing more common in the word boundary and consonants than in, say, the word boundary and vowels. 36

As we have seen, the two contexts, _C and _#, can be unified by assigning both types of consonants to a coda constituent. The relevant phonological rules can now be formulated by the structure in (6). 37

(6) $$\begin{array}{c}\text{coda}\\ |\\ \_\end{array}$$

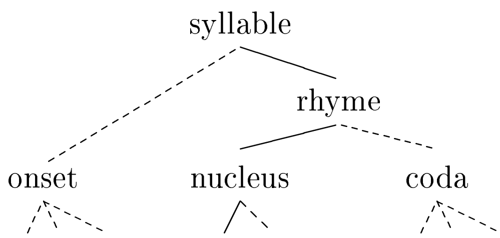
In the case of contrasts like *A*[$^{\text{ʔ}}\text{t}$]*lantic* vs. *a*[t^{h}]*ractive* all there is to do is to assign one of the *t*'s to the coda and the other elsewhere — obviously to the following onset. In many cases such distinctions can be justified by independent evidence, in this one, for example, we can note that one of the clusters in question, *tl,* does not occur word-initially, the other, *tr,* does. 38

One cannot, however, be satisfied with this much. While a significant degree of descriptive adequacy is reached by the formulation in (6), explanatory adequacy is still wanting. For example, lenition, a phenomenon typically associated with the coda position, manifested as glottalization in the previous example, may be adequately captured by the generalization that coda consonants lenite, there is, nevertheless, no 39 reason why it should be the coda position of all that triggers weakening. One promising initiative to an explanation is made by Itô (1986) and Goldsmith (1990), who claim that codas have a weaker prosodic license than other domains of the syllable, therefore coda consonants are more prone to lenition. There is still ground for insisting on the question why it is codas that have a weaker prosodic license. An answer couched in the Government Phonology framework is provided by Harris (1997), who posits a so-called licensing path in phonological domains ranging from the most prominent nucleus through least prominent ones to the onsets of these nuclei. The claim is that the further away a position is from the prime licensor, the more prone it is to lenition. This theory I am going to return to in section **3.2**.

2.2 Problems with the standard view

In (7) I give a diagram that shows my interpretation of the syllable tree **40**
most widespread in the literature (e.g., Lass 1984 : 252, Durand 1990 : 204, Giegerich 1992 : 138, Carr 1993 : 196, Kenstowicz 1994 : 253, Roca 1994 : 141, Blevins 1995 : 213).

(7)



The solid lines in (7) represent obligatory associations, the dashed lines **41**
are optional, i.e., one nuclear segment is obligatory for any syllable, all the others — another nuclear segment and practically any number of onset and coda segments — may or may not be added to complete a syllable.

Given this syllable template syllabifying strings is still not a trivial **42**
issue: the length of both onsets and codas is rather flexible. Nuclei can be found applying the SONORITY SEQUENCING PRINCIPLE, one possible wording of which is quoted in (8).

(8) The Sonority Sequencing Principle (SSP)

Within a syllable sonority rises from the onset towards the nucleus and falls from the nucleus towards the coda.

That is, the sonority peaks of a certain string, away from which sonority falls in both directions, can be identified with the syllabic nuclei. Even if nuclei are spotted easily, the consonantal interlude streching between two sonority peaks must be properly distributed among the coda and the onset. To be able to do this in a principled way the ONSET MAXIMIZATION PRINCIPLE[15] is formulated to the effect of (9). 43

(9) The Onset Maximization Principle (OMP)

If a consonant can be assigned both to a coda and the following onset, assign it to the onset.

Equipped with this principle, consonantal interludes can be unambiguously divided: in a $VC_4C_3C_2C_1V$ string C_1 always goes with the second vowel, then one has to test whether C_2C_1 is a valid onset, if yes it goes with the second vowel, else the syllable boundary is between C_2 and C_1, and so on. One difficulty comes with deciding whether a given consonant cluster is a valid onset or not. The assumption that the set of word-initial clusters is coextensive with that of valid onsets — and likewise that of word-final clusters with that of valid codas — is often accepted (cf. footnote 9) but rarely if ever supported by any evidence. In fact, what can be supported by empirical evidence is the falsity of this hypothesis, as, for example, the CLOSED SYLLABLE ADJUSTMENT rule of French shows. According to this rule e and ə surface as ɛ in closed syllables, and althought sC clusters do occur word-initially, they also close a syllable (Lowenstamm 1981 : 598f). If sC clusters are heterosyllabic within a word, then it cannot be concluded that the set of well-formed onsets is that of word-initial clusters. On the other hand, in most — perhaps all — languages single consonants that can turn up before a vowel may also turn up word-initially.[16] On the other hand, it is not true that in all languages single consonants that can turn up before a consonant 44

[15] An alternative, negative name of the principle could be the "coda minimalization principle." Both names convey the superiority of onsets over codas. In Optimality Theory the same idea is manifest in the ONSET and NOCODA constraints.

[16] Counterexamples include ɾ and ŋ in English, as Péter Siptár (*voce*) points out. To explain them away, the first is a variant of t or d, thus its status is not obvious, the special status of the second is copiously documented, see Gussmann 1998 for a recent discussion.

may also turn up word-finally — this is most evident in the case of languages that have word-internal codas, but lack word-final consonants, like Italian. Also word-final consonants can very often not stand before a consonant word-medially — the distribution of English ð and the affricates could exemplify this situation.[17] Therefore, we may conclude that the only inference that can be drawn is the following: whatever is an onset may turn up at the beginning of a word. To schematize:

(10) The relationship of consonant(s) at word and syllable margins

NAIVE VIEW
word-initial consonant(s) $\Leftrightarrow$ syllable-initial consonant(s)
word-final consonant(s) $\Leftrightarrow$ syllable-final consonant(s)

EVIDENCED VIEW
word-initial consonant(s) $\overset{\nRightarrow}{\Leftarrow}$ syllable-initial consonant(s)
word-final consonant(s) $\overset{\nRightarrow}{\nLeftarrow}$ syllable-final consonant(s)

Another method that may be of use in determining the end of the 45
coda and the beginning of the onset, i.e., the syllable boundary, is provided by the SONORITY DISPERSION PRINCIPLE proposed by Clements (1990), quoted in (11).

(11) The Sonority Dispersion Principle (SDP)

a. The preferred initial demisyllable maximizes the dispersion in sonority.
b. The preferred final demisyllable minimizes the dispersion in sonority.

An initial demisyllable is the first half of the syllable up to and including 46
the vowel — with certain language specific differences in the case of long vowels and diphthongs —, a final demisyllable is the second half from and including the vowel; i.e., the onset with the (first half of the) nucleus and the (second half of the) nucleus with the coda, respectively. Sonority dispersion is maximized if the individual members of the demisyllable are evenly distributed on the sonority scale: in an initial demisyllable the

[17] The only counterexamples are *rhythmic* and *logarithmic* for ð — both have forms, *rhythm* and *logarithm*, in which the ð and the m are not adjacent —, and some other syncope created clusters like in *natural* ˈnætʃrəl for the affricates.

first member being the least sonorous (an obstruent[18]), the last the most sonorous (a vowel) and if there is a further member between them then that should be a liquid. In the final demisyllable, sonority dispersion is minimized, that is, the best case is not to have a coda at all, or at least have very sonorous segments in it. The OMP is a derivate of the SDP: it is not only preferable not to have a coda, but also to have an onset and thereby a large — or at least some — sonority distance in the onset–nucleus sequence.

In the case of a string like *atla* both the SDP and the OMP prefers the syllabification *a.tla,* yet in many languages, including English or French, *at.la* is the accepted division, since *tl* is not encountered word-initially and — as already noted — the t behaves differently before l and r. The third logical possibility, *atl.a,* is the worst, it even violates the SSP, introduced in (8). What we end up with are both principles, the SDP and the OMP, only partially satisfied. One way out of this situation is to abandon the apparently self-evident hypothesis that superficial adjacency is evidence of adjacency at all levels. Syntacticians have long noticed this fact,[19] for phonologists it still is not always obvious. Accepting the — let's call it — adjacency hypothesis makes it seem trivial to determine syllable structure simply by looking at the string of segments constituting the word. The price to pay is that we have to content ourselves with dispreferred syllable structures and contacts, on the one hand, and the unbelievable complexity and number that syllable types will exhibit, on the other. If we are not willing to pay this price, we have to allow some degree of abstraction — although it is controversial whether this is indeed an abstraction after all, as shown in section **1.3** —, dispensing with the view that adjacent segments are necessarily adjacent underlyingly. In this way, syllable structure can be radically simplified. 47

[18] Clements assumes a five-step sonority scale: obstruents < nasals < liquids < glides < vowels. He claims that the algorithm he gives for measuring sonority dispersion also works for more refined scales, but argues that such scales lose cross-linguistic generalizations and become too language specific.

[19] For example, current syntax posits an empty category in the string *the man I want ∅ to go* but not in *I want to go* in order to explain, among other things, the impossibility of *wanna*-contraction in the first.

2.3 Empty nuclei in the skeleton

In this section I am going to introduce a train of thought that allows skeletal positions to remain empty, abandoning the adjacency hypothesis. Government Phonology (GP), especially Kaye & al. 1990, Kaye 1990 and Charette 1991, is one theory that uses empty vocalic positions, but is not unique in this respect, cf., for example, Anderson 1982, Spencer 1986, Burzio 1994, Siptár & Törkenczy forthcoming.[20] **48**

One motivation for Kaye & al. (1990) to assume empty nuclei bears close resemblance to the impasse situation encountered above, the syllabification of *atla.* The claim is that any two consonants that are indeed adjacent are in a governing relationship with each other, i.e., one of them governs the other. The governing potential of specific consonants is determined by their melodic content:[21] some consonants are typically governors, others typically governees. As a result, if a consonant cluster xy is established as a coda x followed by an onset y — in which then y governs x —, the opposite, yx, will definitely not be the same type of cluster, coda–onset in this case, since that would require the previous governing relationship to be swapped, the governor y to now be governed by the governee x. This is deemed impossible, because codas are always governed by the following onset. **49**

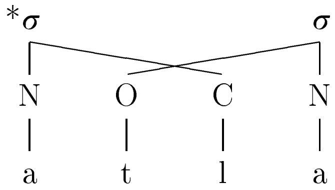
Translated to our case, if *alta* is syllabified *al.ta* — and there is good reason to do that: having a small sonority distance in the nucleus–coda sequence and a great one in the onset–nucleus sequence, it perfectly matches the requirements of the SDP —, *atla* cannot be analysed as a coda–onset cluster too, i.e., **at.la.*[22] If we are also unable to squeeze both consonants into the onset (**a.tla*) or the coda (**atl.a*), there is no possible syllabification in a model that accepts the adjacency hypothesis. **50**

[20] It is interesting to note that hypothesizing empty consonantal positions is more obvious — and chronologically earlier (e.g., Selkirk & Vergnaud 1973, Clements & Keyser 1983) — than empty vocalic positions: the silence of the former is more straightforward than that of the latter, a possible reason in proposed in section **4.3**, ¶142.

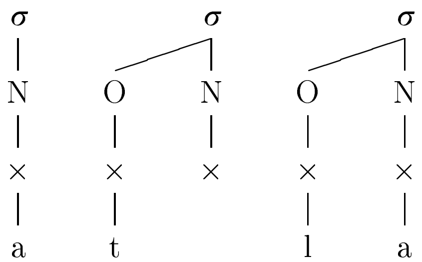
[21] In some versions of the theory governing potential is a function of the charm value of the given segment, but then charm is dependent on melodic content.

[22] Note that Clements's (1990) theory would allow this option, albeit as a highly marked and unpreferable syllable contact. By doing so, Clements is paving the way towards Optimality Theory, where "anything goes," constraints are more or less preferably violable.

It would be desirable to say that the *t* of *atla* is an onset and the *l* a coda, since — as the SDP suggests — *t* is an ideal onset consonant, and *l* is okay for a coda. This would unfortunately lead to a violation of the constraint banning crossing lines as shown in (12), where σ denotes the syllable node, O, N and C should be obvious.

(12)


Allowing melodically empty skeletal positions into our theory of- 51
fers a solution to this problem: we are now able to say that the two consonants are not adjacent underlyingly, there is an empty vocalic[23] position ($\emptyset$) between them. Thus we can have both consonants in separate onsets (*a.t*$\emptyset$*.la*), in an onset and a coda (*a.t*$\emptyset$*l.a,* this is a possible manifestation of the idea in (12)) or in separate codas (*at.*$\emptyset$*l.a*), though the second option is a bit strange, the last one rather perverse and neither is favoured by the SDP. The two-onset representation is the most plausible, (13) shows this option syllabified with an empty skeletal position. The skeletal tier is now included since once we have empty positions on it the alphabetic symbols abbreviating melody cannot simultaneously represent skeletal positions anymore.

(13)


It is an interesting question to ask how the SDP would react to the 52
syllabification *a.t*$\emptyset$*.la.* The sonority of an unpronounced segment is undefined, therefore the sonority rise in the syllable *t*$\emptyset$ is indeterminable.

[23] Of course, one might hypothesize an empty consonantal position between the two consonants but that would not bring him any closer to a viable analysis: hosting the extra C position is yet another pain in the neck.

Nonetheless, the absence of codas is of merit in the eyes of the SDP; onset maximization is fully performed.

53 There seems to be a difficulty with this solution. As we have seen in section **1.2**, melodically empty skeletal positions do have a phonetic interpretation: the most unmarked vocalic segment (ə, ɯ, ɨ or something similar) if dominated by a nuclear position, or the most unmarked consonantal segment (the identity of which is debatable and indeed debated in the literature) if dominated by a nonnuclear position, i.e., the onset or the coda. This means that the phonetic interpretation of the representation in (13) should be atəla or atɯla, a pronunciation that would cause no debate in phonologist circles as regards its syllabification. If we are to maintain the results of section **1.2** and posit *unpronounced* empty positions simultaneously we have to claim that some melodically empty skeletal positions are pronounced, others are not. The theory must provide some means to predict the pronunciation or nonpronunciation of a skeletal position in each case. GP's solution is the formulation of the phonological EMPTY CATEGORY PRINCIPLE, which is given in (14). This formulation is in its essence identical to that of Kaye (1995 : 295).

(14) The Empty Category Principle (ECP)

A melodically empty skeletal position remains unpronounced if
i. properly governed,
ii. domain-final (parametric) or
iii. enclosed within an onset-to-onset governing domain.

54 Let us first examine the first clause (14i) of the ECP. To do this we need a definition of PROPER GOVERNMENT. This is given in (15), again cited almost verbatim[24] from the same locus.

(15) Proper Government (PG)

A nuclear position α properly governs a nuclear position β iff
a. α is adjacent to β on its projection,
b. α is not unpronounced,
c. no governing domain separates α from β.

[24] I have modified clause b of Kaye's definition. Originally it run "α is not itself licensed." What causes the problem here is the two meanings of the term licensing (cf. Brockhaus 1999 : 208, fn. 22): a position may be licensed to be part of the representation, but also to remain unpronounced. Kaye here has the latter meaning in mind.

Clause (15a) simply means that the governing and the governed vowels 55
cannot be separated by a third nuclear position, clause (15c) means that no consonant cluster may intervene—recall, there is a governing domain created by any truly adjacent consonants in GP, while clusters of non-adjacent consonants contain an empty nuclear position, hence fall under clause (15a). The middle, empty nucleus of *at∅la* satisfies all the requirements for proper government, and therefore may remain uninterpreted.[25] We may conclude that the phonetic interpretation of a melodically empty skeletal position depends on the syntagmatic relations it has with other positions in its string.

Another location where GP posits empty nuclear positions is after 56
word-final consonants (cf. Kaye 1990). The suggestion is based on the observation that word-final consonants often exhibit different behaviour from word-medial codas: they usually do not count for syllable heaviness, they often host segments that word-medial codas cannot (e.g., affricates in English), they often do not cause closed syllable shortening, etc. These phenomena—captured by the notion of extraprosodicity in another part of the mainstream literature—are neatly, though as we are going to see not unproblematically, explained by denying the codahood of word-final consonants. While it is true that these consonants also show properties of codas (e.g., they are more ready to undergo lenition than onsets proper) thus it is not uncontroversial that they should be onsets, the extraprosodicity account, which distinguishes them from both codas and onsets, misses the generalization that word-final consonant clusters in, for example, English are with a few exceptions the same as intervocalic coda–onset clusters. If the second of a two-member word-final consonant cluster is made extraprosodic, the grammar duplicates the phonotactic statements on VC.CV clusters by having to make them again on VC⟨C⟩#[26] clusters (Harris 1994 : 74f).

The possibility of word-final empty nuclei is language specific: it is 57
a parameter of UNIVERSAL GRAMMAR that is not available in the default case (not having word-final consonants is the unmarked case), but set on

[25] The careful reader may now ask whether it is the word-initial or the word-final *a* of *at∅la* that properly governs the empty nucleus. Being a manifestation of interconstituent government, it is standardly assumed to propagate from right to left, therefore it is the last *a* that does the job. One notable exception is Rowicka (1998), who argues that PG is left-to-right.

[26] As is conventional, I use angled brackets to denote extraprosodic segments.

in some languages, which thus may have a consonant at the end of the word (cf. (14ii)).[27] This property, Kaye (1990 : 323f) claims, is distinct from having codas, the two parameters produce a cross-classification: languages may have codas only word-medially, like Italian, or only word-finally, like Luo, in addition to having them in both locations or neither. The existence of four different groups of languages with regard to non-prevocalic consonants is further evidence for denying the coda status of word-final consonants.

To conclude the discussion of empty positions in GP, we may say **58**
that by positing empty nuclear positions in the skeleton the theory reduces the cases where consonants are syllabified into the coda position. This tendency is in line with the generally accepted view that onsets are to be preferred over codas in syllabification. One salient feature of GP is its affinity to turn generalizations that other theories look at as universal preference statements into unviolable constraints. This property distinguishes the approach quite radically from Optimality Theory, where any constraint is violable. In the case discussed above, the fact that an obstruent–liquid cluster is a dispreferred coda–onset cluster is tightened to the claim that it *is never* a coda–onset cluster. If one dares take this thought to its conclusion, the next question to ask is if codas exist at all, after all the optimal final demisyllable is one without a coda. We are going to proceed in this direction.

[27] The plausibility of the ECP is reduced by the fact that it includes clauses that are of so different types. The repartitioning of the skeleton introduced in chapter **5** reduces the number of disparate clauses.

2.4 Does the coda exist?

What we have to examine is the arguments supporting the existence of 59
the coda position. As it was already noted there is a sharp asymmetry between the two margins of the syllable, the onset and the coda. The most unmarked syllable type, available in all languages, is CV, i.e., one that contains an onset but no coda. Furthermore, while in the unmarked case the onset is obligatory — contrary to what Blevins (1995 : 218–220) claims[28] —, it is the marked case to have a coda.

One of the reasons why codas are posited in the first place is the 60
assumption that syllable boundaries and word boundaries coincide. If consonants are found at the right margin of words then they obviously occupy the right margin of a syllable. But, as we have seen, there is also phonological evidence which indicates that word-final consonants are not uncontroversially codas.

Codas also have explanational value in the formalization of stress 61
rules. In languages with unfixed stress, rules are often sensitive to syllable weight. The standard case is that syllables with only a short vowel count as light (therefore usually unstressable), while syllables more fleshy than that — either closed by a consonant or containing a long vowel — are

[28] Blevins says "the unmarked case is that onsets are not obligatory." Interestingly, of the four arguments she brings up to support the claims about unmarkedness in syllable constituency two explicitly argue *for* obligatory onsets being the default case: "(3) All languages have CV syllables" — while, apparenly, only *some* have V syllables. Accordingly, CV is less marked than V. If it were the marked case to have obligatory onsets, then languages with only CV syllables would be more marked than others with both CV and V syllables. The oddity is that while the former has only the unmarked syllable type, the latter has also a marked type. Also, "(4) … there are a variety of phonological processes which take marked syllable types to unmarked types…, but there are few if any rules which consistently result in [marked syllable types]." The avoidance of hiatus is a widespread phenomenon, which aims at getting rid of onsetless syllables, while losing onsets is typical only of intervocalic/posttonic, not of other types of onset. Blevins also says: "In second language acquisition, speakers have little difficulty in shifting from a 'yes' value to a 'no' value fro a given parameter, but do show difficulty in switching from a 'no' value to a 'yes' value" (*ibid.*). Yet it is hard to see any difficulty in getting from a language having both CV- and V-type syllables to one which only has the former, which allegedly is the marked type. Furthermore, the "yes" and "no" values crucially depend on the formulation of the parameter: "obligatory onset" for Blevins, but it might as well be "nonobligatory onset".

heavy (and attract stress). Positing a constituent, the rhyme, dominating the nucleus and the coda facilitates the definition of heaviness: syllables with rhymes containing one segment are light, those with multisegmental rhymes are heavy. Unfortunately, neither the branching of the rhyme, nor that of the nucleus may be held to be responsible for heaviness, all we can say is that one of the two must branch. Another problematic aspect of this approach to syllable weight is the fact that onsets (apart from very few and therefore suspect cases) do not contribute to it. One either stipulates that only the size of the rhyme is relevant or offers some theory that assigns weight, standardly referred to as mora, to the appropriate segments. However, even the latter option does no more than formalizing the observation that coda consonants do, while onset consonants do not influence the weight of a syllable, without explaining why this and not the opposite should be the case. The alternative below (in section **2.5.1**) fares better in both respects: it explains why both closed and long-vowelled syllables are heavy and why onsets do not count.

The minimal word phenomenon, that constrains the size of lexical **62**
words in a number of languages as diverse as English, Hungarian, Beijing Mandarin, Khalkha Mongolian and Turkish (for the last three cf. Denwood 1998), also depends on a plausible formulation of heavy syllables. The observation is that in these languages a lexical word cannot be a single light syllable, it must either be a heavy syllable or two light syllables. In monosyllables the necessary weight is provided either by the length of the vowel or a final, allegedly coda, consonant.

Another reason for assuming codas is the widely observed phe- **63**
nomenon of closed syllable shortening. If the size of the rhyme is limited to two segments, the largest syllable types available are an open syllable with a long vowel (-VV) or a closed syllable (-VC) whose vowel must be short since three segments are too many in a rhyme.[29] Consequently, if an open syllable containing a long vowel is made closed by some phonological process its vowel must shorten so that the domain does not exceed its limits. If the one involving codas were the only plausible explanation

[29] This is stated as the BINARY THEOREM by Kaye (1990 : 306) and Kaye & al. (1990 : 199) and deduced from different principles in different ways by Kaye (& al.) on the one hand and Charette (1989 : 161ff) and Lowenstamm & Kaye (1985–1986) on the other. Harris (1994 : 68ff) in his analysis of English is forced to abandon the restriction.

for closed syllable shortening, codas would be safe. We are going to see below (**2.5.2**) that this is not so.

One of the standard arguments for constituenthood in the subsyl- 64
labic domain is the existence of phonotactic constraints. For instance, the almost very strict restrictions holding between the two members of a branching onset — disregarding sC clusters now — may be seen as evidence that such consonants form a constituent. Similarly, in nuclei the types of attested vowel clusters, i.e., diphthongs and long vowels, is restricted to a small subset of all the possibilities. As opposed to this, very few qualitative[30] phonotactic constraints apply to VC clusters, that is, within the rhyme.[31] Where we do encounter phonotactic constraints between consonants is in intervocalic and word-final clusters. Intervocalic clusters of the type nt, mp are rather unanimously analysed as heterosyllabic, coda–onset clusters. Yet, it is not usual to consider these clusters as members of the same syllabic constituent. Therefore, we may conclude that the existence of some phonotactic constraint between two segments does not necessarily imply that they share their host constituent.

Recall that different syllabifications were suggested for *al.ta* and 65
a.t∅.la, as shown here. If we accept that some intervocalic consonant clusters are coda–onset clusters, while others are onset–onset clusters containing an empty nucleus between them, our theory becomes indeterminate. Nothing excludes the syllabification *a.l∅.ta*: there will be no way of knowing whether a cluster that satisfies the criteria for coda–onset clusters is to be analysed as such or as an onset–onset cluster that accidentally happens to contain consonants which would also make a coda–onset cluster.[32]

[30] The quantitative constraint, referred to as closed syllable shortening, was treated above.

[31] The most often cited such constraint bans noncoronal consonants after aʊ in English (Anderson 1986). Hungarian does not allow nonround vowels (i ɛ) before word-final labial nasal-stop clusters (Törkenczy 1994 : 338), and only ø is possible before a word-final lateral liquid–palatal stop cluster (viz., lɟ). Nobody has very much to say about such constraints, they do not seem to be systematic and may even be attributed to lexical/historical accidents.

[32] Of course, phenomena like closed syllable shortening or heaviness for stress assignment may tilt the balance in this or that direction, but only in case C.C and C∅.C are treated differently in the analysis of these phenomena.

To summarize: the theoretical status of the coda is strongly challenged. It 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. Though positing a coda position seems to help in distinguishing heavy and light syllables, there are serious problems with the formulation. While closed syllable shortening can be explained by reference to the impossibility of a coda following a branching nucleus, there are alternative explanations to be discussed below. Finally, the possibility of analysing some clusters both as coda–onset and as onset–onset clusters loosens the theoretical tightness of the framework. **66**

2.5 Without codas

Making a constraint out of the preference of the Sonority Dispersion Principle, one may claim that all syllables have an onset and none have a coda (cf. Lowenstamm 1996).[33] Setting aside for the time being the possibility of having more than one consonant in a single onset constituent, this means that whenever we find a consonant that is not followed by a vowel it must be followed by an empty nucleus — to make it, at least theoretically, an onset. **67**

It is important to bear in mind that the question whether something is in coda position or not is not an empirical one; this property does not in itself have any physical correlate. The rationale of positing a coda position is to unify the contexts that pattern together in certain phonological phenomena. If these contexts may be unified by other means there is no strong argument for keeping codas in the theoretical vocabulary, unless one needs it for descriptive purposes, as a dated but useful term, similarly to the way a syntactician would refer to S(entence)s even after showing that they are I(nflection)P(hrase)s or C(omplementizer)P(hrase)s. This is the sense the word coda will be used hereafter. Actually, if codas do **68**

[33] Note that GP theorists regularly argue that the coda *consituent* is nonexistent in their theory. There still are codas in GP, since rhymes may branch, what the right branch dominates is the coda as opposed to the other two consonantal positions that are in the onset (which may also be branching), i.e., the term coda is a shorthand for the "postnuclear rhymal complement". My aim above, however, was to show that as regards their skeletal status all consonantal positions are equal, the only difference is whether a consonantal position is followed by an interpreted vocalic position or not.

not have a theoretical status then it does not make much sense to talk about onsets either, even if — what is kept in benign ignorance — they are imagined to be potentially branching; the onset constituent becomes *the* consonantal domain, as opposed to the nucleus, which is, and always was, the vocalic domain. What are thus left of syllabic constituents is a consonantal and a vocalic constituent.

Having stripped syllabic constituency so brutally, one might as well 69
take the last move and claim that neither the consonantal, nor the vocalic constituent ever branches, that is, the skeleton contains a strict alternation of consonantal and vocalic *positions*; this is exactly what Lowenstamm (1996) does. Arguments for this final step do not readily offer themselves, some motivations will, nevertheless, be pointed out in the next section. Even without explicitly arguing against branching nuclei and branching onsets, formal simplicity is a criterion that opts for nonbranching constituents. Recall (from section **1.3**), if current phonological theory were initiated by phonologists whose native language was Zulu a CVCV skeleton would surely have been the starting point.

In this section we are going to see the way the CVCV framework 70
handles some coda-related phenomena discussed in section **2.4**.

2.5.1 Heavy versus light syllables

In a theory comprising only CV pairs to represent syllable structure, a 71
light syllable will be made up of one such pair, while a heavy syllable will contain two of them as shown in (16), where the Greek letters stand for any, potentially identical, melodic material (if identical, the two symbols are merged in (16b)):

(16) a. LIGHT SYLLABLE

C	V
|	|
α	β

b. HEAVY SYLLABLE TYPE I

C	V	C	V
|	|		|
α	β		γ

c. HEAVY SYLLABLE TYPE II

C	V	C	V
|	|	|	
α	β	γ	

The advantages of the representations in (16) are the following: 72
(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 both containing some melodic material.[34] 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. In a sense then a CV slice of the skeleton is the equivalent of the mora in frameworks that measure syllable weight by that means, but unlike moraic frameworks we get a nonstipulative account for the lack of onset weight. The CVCV approach, however, still owes an explanation for why word-final consonants often fail to contribute to syllable weight.

Note also that in languages like Latin or English, where stress rules 73
typically take the form "if the penult is heavy stress it, if it is light stress the antepenult," there is room for a simplified formulation: e.g., stress the third last CV pair, boxed in the Latin words illustrating the rule in (17):[35]

(17) a. *domínica* 'lord adj.fem.'

C V $\boxed{\text{C V}}$ C V C V

d o m i n i k a

b. *arḗna* 'sand'

C V $\boxed{\text{C V}}$ C V C V

a r e n a

c. *agénda* 'things to do'

C V $\boxed{\text{C V}}$ C V C V

a g e n d a

[34] In a subset of the languages distinguishing heavy and light syllables only (C)VV, but not (C)VC counts as heavy. In such languages it is apparently the pronunciation of the V part of the CV unit that is taken into account. Crucially, no language takes (C)VC to be heavy to the exclusion of (C)VV. This falls out neatly in the CV model: in such a language the interpretation of the V should matter in the first, but that of the C in the second CV pair. With rhymes and nuclei it is not so evident why there exist no languages where the branching of the rhyme would make a syllable heavy, that of the nucleus would not.

[35] The situation is not as neat as depicted here. Difficulties arise in the following cases: the third last CV pair may contain an empty V position, stress in this case appearing on the fourth (*fórmula* 'rule'), word-final long vowels count as if short (*fáciō* 'make') and word-final consonants do not count (*ácidus* 'sour'). The last case will be explained in section **5.2.4**.

It is rather complicated to capture the minimal word constraint, 74
which limits the size of content words to two moras at least, in the traditional GP framework. Since word-final consonants are claimed to be onsets followed by an empty nuclear position, one has to say that either the nucleus of the only syllable of the minimal word must branch or the word must contain two onset–rhyme sequences.[36] The CVCV formulation is trivial: the minimal word contains two CV pairs (perhaps in order to be stressable). Nonetheless, we are again forced to do counting. The formulation is descriptively adequate and better than standard GP's, but theoretically problematic: one rightfully wonders why there do not exist languages with three- or four-mora-long minimal words. An alternative, which does not face this difficulty is offered in section **5.3**.

2.5.2 Closed syllable shortening

To show what the CVCV approach can do with the phenomenon of closed 75
syllable shortening, I repeat and comment on what Lowenstamm (1996 : 12–13) has to say on the issue.

Of the two hypothetical forms, *ka:tpi and ka:tupi, the first is un- 76
grammatical because it contains a long vowel in a closed syllable. Using only CV pairs in the representation, a closed syllable takes the form of at least two CV pairs with the latter containing an empty V position. The representation of a long vowel is also two CV pairs of which the second is totally devoid of melodic material, it is the vocalic melody of the first pair that is interpreted in the V position of the second pair, as shown in (18b):

(18) a. katpi, *ka:tpi

C	V	C	$V_{\$}$	C	$V_{£}$	C	V
k	a			t		p	i

b. ka:tupi

C	V	C	$V_{\$}$	C	$V_{£}$	C	V
k	a			t	u	p	i

For the vocalic melody to be interpreted in the $V_{\$}$ position that posi- 77
tion must be licensed. It is licensed if it is properly governed (cf. (15)). However, an empty position which is itself licensed is unable to properly govern the preceding position. While in (18b) the relevant position, $V_{£}$ is unlicensed and pronounced, hence can properly govern and thereby

[36] An alternative, slightly less disjunctive but no more plausible formulation is the following: a minimal word must contain two slots dominated by a nuclear node.

license the $V_{\$}$ position, in which the vocalic melody of the first V can be interpreted, this does not hold in (18a).

The rhyme-maximizing theory of closed syllable shortening faces a serious challenge: if seen as a dynamic process it violates the principle of structure preservation. A coda position not present lexically may not be created by some phonological event. If, however, we cannot create a coda position in a rhyme containing a branching nucleus (i.e., after the long vowel), closed syllable shortening cannot be motivated. This problem is overcome by the CVCV approach. The analysis of closed syllable shortening in (18), however, is not fully satisfactory, I am going to return to the phenomenon in section **7.2.5**. **78**

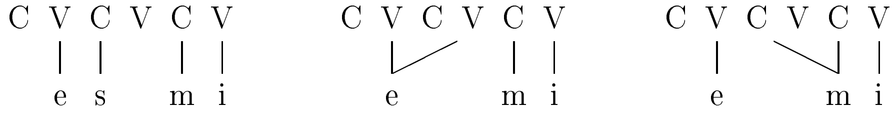
2.5.3 Compensatory lengthening

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[37] is realized in Classical Attic as eːmi 'I am', while Aeolic has emːi. 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 again 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 (19c) or removes the obstacle that has prevented the preceding V from taking it (19b). Which of the two strategies is applied can be predicted on a language — here dialect — specific basis: it looks very much like a parameter.[38] **79**

[37] The asterisk of this form is that of a reconstructed, undocumented but probable, not of an ungrammatical form.

[38] Lowenstamm & Kaye (1985–1986 : 114) argue that gemination, (19c), is the default case, while vowel lengthening, (19b), only occurs if the system lacks the relevant geminate consonant. This may be related to the fact that coda–onset clusters appear to be less marked than long vowels.

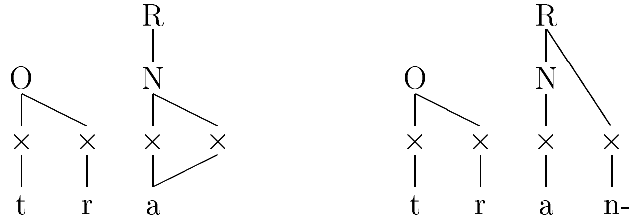
(19) a. Reconstr. *esmi b. Attic eːmi c. Aeolic emːi



2.6 Against constituency[39]

All three syllabic constituents, the onset, the rhyme and the nucleus, are imagined to be potentially branching by GP theorists and most mainstream researchers alike (for the latter, even the coda is potentially branching). In the former, more restrictive, framework a maximal syllable has one of the structures depicted in (20). **80**

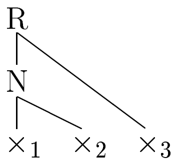
(20)



In a GP-like framework the nonexistence of codas amounts to the claim that the rhyme constituent does not branch, and if it does not branch it is not a syllabic constituent — it shares the fate the coda has suffered earlier. It is in fact a felicitous development of the theory to have got rid of the rhyme constituent, which is a nuisance in more than one respects. For one thing, the rhyme is the only syllabic constituent that does not dominate exclusively skeletal slots but also another syllabic constituent, the nucleus. This fact has led to uncertainty about whether and why a branching nucleus may occur in a branching rhyme. In one view (that of, e.g., Kaye & al. 1990) it cannot, because in such a constituent — shown in (21) for those with a visual disposition — no head can be assigned; this is the Binary Theorem already mentioned in section **2.4**, ¶63. The two constraints that head and dependent must be adjacent and that their relationship is unidirectional destroys the hopes **81**

[39] Takahashi (1993) reports on his research under a similar, but wittier title. He, nevertheless, keeps to the possibility of adjacent consonantal or vocalic positions, only it is licensing holding between them, and not some dominating node, that accounts for their relationship.

of all three possible candidates: the first is not adjacent to the third, the second would have one dependend on the left, one on the right, the third is not adjacent to the first.

(21) 

However, when forced to accept the structure in (21), as Harris **82**
(1994 : 68f, 76f, 82f) is in order to cater for words like *dainty, easter, b*[ɑː]*sket, saint, post, wild*[40] etc., one may seek refuge in the idea that the head of the rhyme is not on the skeleton, but it is the nuclear node itself. It is not unreasonable to look for the head of a constituent among its daughters, after all. If the rhyme should no more exist, the dilemma also perishes.[41]

If syllable heaviness is not (merely) a function of the number of **83**
skeletal positions in the rhyme, representing long vowels and diphthongs by branching nuclei becomes much less obvious. The wish to keep syllables together as onset–rhyme sequences is also in vain if codas are let loose. The "phonetic unity" of long vowels — whatever that should mean — is not a strong argument: a long vowel is just as much a unit as a long consonant, the latter is, nevertheless, a coda–onset cluster, thus not one constituent, in most frameworks. (Not to mention the fact that without codas long consonants hopelessly become C∅C clusters.)

The claim that "all feet are minimally binary and that the word in **84**
many languages must consist minimally of a foot" (made by McCarthy & Prince (1986) and quoted by Harris (1997)) suggests that just as `tata` and `tat` (the latter obviously *tat∅*) are binary feet — hence qualify for minimal words in the languages concerned —, `taː` must also somehow make a binary foot. The number of vocalic positions involved in the string is undisputedly two, but the immediate constituens of foot nodes are usually either syllable nodes or, in their absence, nuclei. Only by

40 Though Harris does allow type (21) superheavy rhymes (1994 : 69, 83), he also has to strictly limit their occurrence to ones with coronal and very few other consonant clusters.

41 The problem of superheavy rhymes unfortunately does not disappear with this move.

analysing the aː as two nuclei, i.e., N∅N, do we obtain a binary foot, thus satisfying the minimal limit on word size. Note that the same argument was already brought up in section **2.5.1** cast in a slightly different form.

Kaye (1985 : 290f) and Lowenstamm & Kaye (1985–1986 : 99f) claim **85**
that there is an implicational relationship between branching rhymes and branching onsets. The observation, called the RHYME-DOMINANT PRINCIPLE, is that languages having branching onsets invariably have branching rhymes (i.e., closed syllables), while the opposite is not true, languages with branching rhymes may or may not have branching onsets. To put it in other words, branching onsets are more marked than closed syllables.[42] Whether this calls for the abandonment of the hypothesis that onsets, or rather, the consonantal constituent, may branch is not fully obvious. The question basically boils down to the markedness of branching constituents and that of empty skeletal positions.[43] Theoretical uniformity requires either the retention of constituency throughout the whole range of syllabic constituents or their total abandonment, which means positing a C∅C structure to branching onsets as well.

One last consideration that is relevant for the total rejection of syl- **86**
labic constituency is that if the skeleton contains strictly alternating C and V positions—no adjacent Cs and no adjacent Vs—then it is trivial to parse a phonological string, provided the listener can distinguish consonants and vowels: whenever he encounters two instances of the same category an empty position of the opposite type must be inserted between them, while two different categories will be adjacent.[44] This advantage is not available in a system where at some points one may assume two adjacent Cs or Vs, at another they will be separated by an empty category.

[42] Lowenstamm & Kaye (1985–1986 : 111) also claim that long vowels are more marked than closed syllables, that is, there exist no languages with long vowels and/or heavy diphthongs and only open syllables. If one accepts the proposal suggested here, this is a further argument for the V∅V representation of long vowels.

[43] There is a third possibility, branching onsets could be considered to be contour segments (cf. Rennison 1998). This idea includes large scale reshuffling of segmental representations, space limitations inhibit further discussion here.

[44] This is only true if two adjacent empty positions are not allowed, two instances of the opposing categories may or may not be adjacent (C∅∅V or V∅∅C).

Consequently, allowing empty skeletal positions into phonological representations concludes to the hypothesis that the phonological skeleton must be made up of strictly alternating Cs and Vs.

3 TWO THEORIES OF LENITION

I will now introduce two theories that not only observe and describe the range of phenomena that can be subsumed under the label lenition but also aim at explaining what happens and why. The primary aim of both theories is to account for the location of lenition — standardly captured as the coda position. In the previous chapter, I have argued against the coda status first of some, eventually of all consonants, a development that renders the lenition-in-coda generalization void. **87**

We are going to proceed as follows: first I briefly discuss what lenition is and outline an obvious way of modelling it (section **1**). Next, I discuss Harris's (1997) theory of lenition, which is a very coherent and instructive model of lenition applying one device, the gradually decreasing power of prosodic licensing, but suffers from some drawbacks as well, which will also be pointed out (section **2**). Ségéral & Scheer's (1998, 1999a) theory of consonant lenition designed for CVCV skeletons, using government in addition to licensing, is introduced in section **3**, leaving a detailed criticism to the next chapters. This chapter is completed by a brief comparison of the two theories (section **4**). **88**

3.1 The relevance of lenition

A requirement of good phonological theories is that they not only describe 89
changes or provide mechanisms whereby the attested surface forms differ from the proposed lexical representations in the desired way, but that they also offer explanations of why these differences exist and show why other alternatives are not viable. Many phonological changes are describable by the dichotomy lenition vs. fortition. It is difficult to define these two notions pretheoretically (Harris 1990 : 257). Obviously lenition takes place in cases where a strong thing turns into a weaker thing, while if the change happens in the opposite direction, we are bound to label it fortition. As to what phonological strength and weakness is, Harris quotes Hyman's quoting of Venneman's definition: "a segment X is said to be weaker than segment Y if Y goes through an X stage on its way to zero."

Historical sound changes and also synchronic sound alternations 90
across languages sketch out general patterns of sound changes. Such patterns, labelled lenition trajectories by Harris (1994 : 120), mark the path taken by sounds from strong stages through weaker ones until their eventual loss. It is observed that stops are the typical starting stages of such lenition trajectories. A stop may spirantize, debuccalize or vocalize, that is, it may turn into a fricative, a glottal stop or a glide, respectively. A fricative may also debuccalize (become h), rhotacize, etc. Glottal sounds ʔ and h and glides are typically the last stage of a lenition trajectory, these sounds are most prone to totally disappear. Changes in the opposite direction, e.g., a fricative or a glide becoming a stop, are much rarer, though not unattested (cf. the j > ʤ and w > g change of a number of Romance languages).

If some sounds are inherently stronger than others, we expect this 91
property to follow from the make-up of the sound. In a framework of equipollent features the stronger sound ought to have more '+' (or perhaps '−') values than a weaker sound (cf. Clements 1990 and Clements & Hume 1995 for a theory involving the former option). Theories using privative features allow a more obvious choice: stronger sounds have more features than weaker ones. Lenition then means that certain components of the sound are lost. What is left to be explained is why components are lost, especially, since within the same system a sound may in some cases lose components, in others not: different stages of a lenition trajectory regularly coexist.

The two theories to be introduced in this chapter fare quite well in approaching explanatory adequacy. Both attribute a central role to the notion of licensing, seeing it as a force that helps maintain the links that join skeletal positions and melodic primes. One of them, Licensing Inheritance, in fact uses no other device, while the other, Coda Mirror, also applies an independently motivated actor of phonological representations, government. **92**

3.2 Licensing Inheritance

Harris (1997)[45] presents a theory that offers an explanation for the weakness of lenition sites. Collecting the environments traditionally noted for encouraging consonant lenition — word-final, preconsonantal and post-tonic intervocalic position — , Harris claims that none of them are uncontroversially codas, in fact, word-final and intervocalic consonants are always, preconsonantal consonants are sometimes in the onset. Therefore its reduced licensing potential is not an adequate way of explaining a coda's weakness. **93**

The basic observation that Harris develops his theory from is that head positions are typically able to host a larger set of segments than nonhead positions. For example, in numerous languages unstressed (i.e., nonhead) vowels constitue a proper subset of stressed vowels,[46] alternatively, in unstressed position vowels neutralize: what would be different vowels, were the syllable stressed, are merged and pronounced identically in unstressed position. It is not only from a larger set that segments can be chosen in head positions but these segments are typically stronger too, in the sense described in the previous section. **94**

Harris also assumes that all but one position in a phonological string must be licensed by other positions in the string.[47] The exception, the head of a domain — syllabic constituent, foot, prosodic word, etc. — is usually licensed externally (from/by some dominating constituent), **95**

[45] This paper is a thoroughly reworked version of Harris 1992; the idea is not as recent as the date suggests.

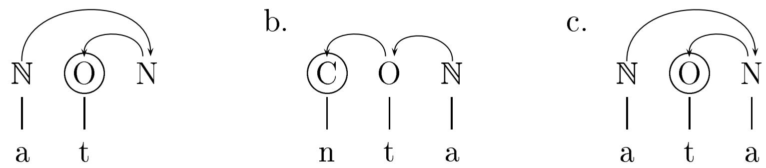
[46] English is not such a language, given that ə, the prototypical vowel of unstressed syllables, does not occur under stress.

[47] This is stated by the PHONOLOGICAL LICENSING PRINCIPLE, e.g., Harris 1997 : 336.

and it is only the ultimate head that may stay unlicensed (or is licensed by virtue of being the overlord). Without this support, labelled P(ROSODIC)-LICENSE, positions are subject to stray erasure: they fail to be interpreted phonetically. It is not only skeletal positions that need to be licensed, but also the chunks of melody, let's call them features, expecting to be realized at a given position need license from some skeletal position. This type of licensing is referred to as A(UTOSEGMENTAL)-LICENSING.[48] The crucial argument is that p-licensing gets converted to a-licensing at the level of the skeleton.[49] The p-licensing a skeletal position gets depends on how far it is removed from the prime source of licensing, the head of the domain. Therefore, the further away a position is from this source the weaker p-licensing it receives and the weaker a-licensing potential it has. As a result such segments lose melodic material.

Three typical lenition contexts—word-final, word-medial coda and 96
posttonic intervocalic positions—are thus unified by the fact that all are at least two steps removed from the prime source of licensing in their domain as shown in (22).[50]

(22) a. b. c.



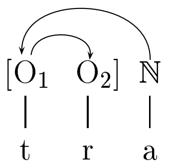
The source of licensing in all three configurations is the nucleus marked 97
by a "white" ℕ. If we accept, as Harris does, that word-final consonants are in fact followed by an unpronounced nucleus (as argued also in section **2.3**, ¶56), then the location of word-final and posttonic intervocalic consonants becomes very similar (22a, c): both are followed by a weak nucleus, which accordingly is licensed by another nucleus. Thus the licensor of both consonants is itself licensed by another nucleus. The situation

[48] For the notion of these two types of licensing cf. Goldsmith 1990 : 108, 123ff.

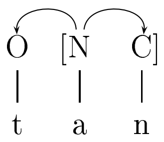
[49] In fact, p-licensing and a-licensing are the same mechanism, the prefixes "simply refer to different facets of what is a single fundamental principle — that of phonological licensing" (Harris 1997 : 336).

[50] In (22a), the second, word-final nucleus is licensed by the first. Note, that this justifies its existence, but not its remaining silent. The noninterpretation of this nucleus is licensed parametrically. On these—and other—meanings of the term "licensing" see section **4.5**.

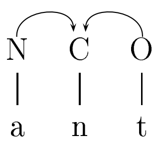
with "real" codas is similar: their licensor, the following onset, is again a position that is licensed (22b). Since onset heads are always licensed by the following nucleus, any position that is licensed by an onset head (viz., the second position in a branching onset and the coda) are weak positions prone to lenition. The indirect licensing of an onset dependent (O_2) is shown in (23).

(23)


It is crucial for this theory to work that coda consonants be licensed **98**
by the following onset only, as in (22b). If a coda were licensed by its "own" nucleus as depicted in (24), then the coda of any syllable would be as close to its licensor as the onset, yielding the false prediction that tautosyllabic onsets and codas are subject to lenition to the same degree.

(24)


It is the CODA LICENSING PRINCIPLE, originally proposed by Kaye (1990: **99**
311), requiring all codas to be licensed by a following onset position, that seems to provide the necessary condition for avoiding nuclei licensing codas. This is not in itself enough, however. The simultaneous licensing of codas by both the following onset and the preceding nucleus is also a viable option. This is given in (25).

(25)


If p-licensing is inherited one would plausibly conclude that doubly li- **100**
censed positions acquire more a-licensing power. This again runs counter to facts, the allegedly doubly licensed coda is a lenition site. Therefore, not only do we have to make sure that a coda is licensed by the following

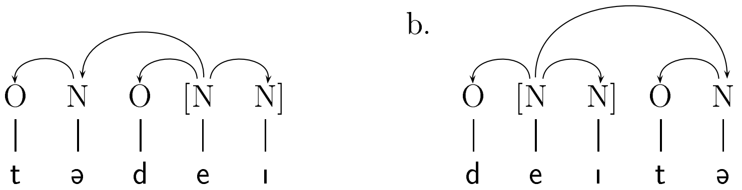
onset, we also have to inhibit its own nucleus from licensing the coda.[51] The stipulation is rather unnatural: in the other two syllabic constituents the head licenses the dependent, in the rhyme it *must* not.

This state of affairs — the fact that vowel-to-consonant licensing 101
appears to be possible only right-to-left (towards the preceding onset), not left-to-right (towards a potential coda or the following onset) — may be used as another argument to support the claim that the rhyme constituent ought to be abandoned. If even licensing fails to join a vowel and a following consonant, there is practically no reason left to assume their sharing a constituent.[52] Therefore, even though Harris's theory retains the rhyme constituent, it implicitly argues against it.

The fortes of Licensing Inheritance[53] are that it relates stress and 102
lenition: since unstressed nuclei are licensed by a stressed nucleus, we expect lenition before an unstressed and not before a stressed nucleus. Furthermore, the widely observed lenition (also called reduction or weakening) in recessive (unstressed) nuclei is also neatly explained by their licensed status. Licensing Inheritance also produces the effects of Government Licensing (Charette 1992): less prominent nuclei are unable to license their onset to govern other consonants.

On the other hand, there is no reason for the absence of lenition in 103
the onset of an unstressed word-initial syllable: the initial t of *todáy* fails to undergo lenition, *ʔə'deɪ, *ɾə'deɪ. With an identical licensing distance and melodic content we do observe lenition if the t is word-medial, like in *dáta* 'deɪʔə, 'deɪɾə. The situation is shown in (26).

(26) a. b.



[51] It must be noted that Harris posits nucleus–coda licensing as a possible V-to-C licensing domain (1997 : 361f).

[52] Perversely, I am going to argue for something that first may seem to be the opposite of this claim further below (in section **5.5**). Nevertheless, at this point in the discussion it appears to be reasonable to assume that constituent heads license their dependent.

[53] In section **4.5**, I will list a number of different ways in which the term licensing is used in phonology. With some lenition and foreign accent, this one could be called Licensing InHarris'sense.

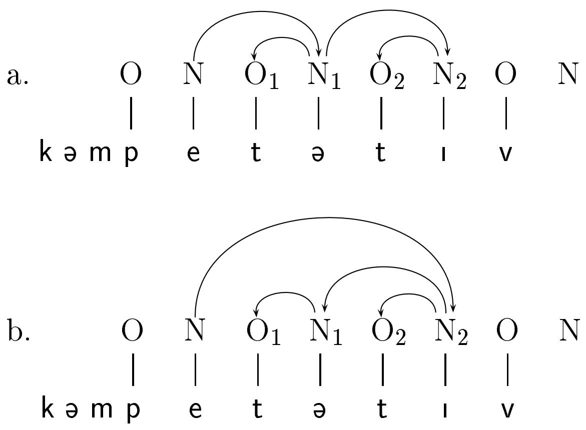
The ultimate head of both phonological domains in (26) is the nuclear **104**
position occupied by e. The onset under examination, taken by a t, is two moves away in both cases. Yet, in (26b) lenition is attested, but our expectations are not fulfilled in the case of (26a). The only difference is the word-initial status of the latter onset and the fact that its nucleus is licensed right-to-left, as opposed to the situation in (26b), where the internuclear licensing path is left-to-right.

Trying to avoid this pitfall by assigning degenerate foot status to **105**
the initial tə of *todáy* — a reasonable idea in itself, proposed for Danish by Harris (1998 : 18, note 3) — does not help us out, since foot heads must be licensed in the framework: recall, one of the cornerstones of the theory was the Licensing Principle, which requires all but one skeletal position in a domain to be licensed. The first nucleus (containing ə) of *todáy* is certainly not a serious candidate for the unlicensed position in the word domain. On the other hand, the absence of foot-initial lenition (cf. *ar**t**ìculátion, a**tt**ènuátion, de**t**èriorátion, de**t**èrminátion, ma**t**èrialístic* etc., all *ʔ, *ɾ in the place of the emboldened *t*) suggests that for lenition licensing domains are not words but only feet.[54] Thus, if the foot is indeed the relevant domain, heads of feet remain unlicensed, in which case promoting the tə of *todáy* to foot status solves the problem of word-initial nonlenition.

Examining the scope of lenition further, we find another environ- **106**
ment where Licensing Inheritance faces some difficulty. In a word like *compétitive* the two t's are subject to the same type and degree of lenition (kəm'perərɪv or kəm'peʔəʔɪv). Harris does not tell which of the two partial licensing paths of (27) would be more plausible. If we select (27a), the second t, the one in O_2 should be more prone to lenition than the first, in O_1, if (27b), the expectation is the opposite. Neither is observed.

[54] Harris (1997) means this throughout the paper, but does not show that the word domain is too large for Licensing Inheritance.

(27)



The question is whether the foot structure of the word is *com(pétitive)* **107**
or *com(péti)(tive),* where feet are enclosed by parentheses. The first option is totally incompatible with the general wish to reject unbounded feet, and would not necessarily decide the dilemma anyway. The second option is the source of another difficulty, namely, a distinction must now be made between heads of feet that are initiators of a licensing path (like, perhaps, the first vowel of *todáy*) and others which are not, like the *-tive* of *com(péti)(tive)*.

Harris also acknowledges that in the Spanish s > h lenition reference **108**
has to be made to the melodic content (perhaps to the phonetic realization) of the licensing nucleus: if it is pronounced there is no lenition, irrespective of its rank in the prosodic hierarchy (1997 : 355). Licensing Inheritance, however, has no formal means of making reference to a skeletal positions being pronounced or not. A solution is offered in the next section, in footnote 58.

In addition, in its present state Harris's theory has nothing to say **109**
about the direction of lenition. An oral stop may debuccalize (t > ʔ), but it may also sonorize (t > ɾ). The two processes are not on the same lenition trajectory, if lenition begins towards one of these stages, it will never reach the other. The first process is typical of (but not unique to) word-final and certain preconsonantal positions, while the latter is usually encountered intervocalically. This is not predicted by Licensing Inheritance.

3.3 Coda Mirror

In a conference paper (Ségéral & Scheer 1998) and a subsequent manuscript Ségéral & Scheer (1999a) offer a theory of consonant lenition that operates on a strict CVCV skeleton, i.e., one that lacks branching syllabic constituents. Their primary aim is to identify the disjunctive set postconsonantal or word-initial, which—as opposed to the coda—is the strong consonantal position. The environment is given in (28).[55] **110**

(28) $\left\{ \begin{matrix} \mathrm{C} \\ \# \end{matrix} \right\} \_$

Recall that a very similar configuration, the one in (5), was proposed to be capturable by the syllabic constituent coda, (6). At a first glance one may naively think that the disjunctive environment in (28) could then be translated as that in (29). **111**

(29)
$$\begin{array}{c} \text{onset} \\ | \\ \_ \end{array}$$

However, as we have seen in sections **2.4** and **2.5**, there is considerable evidence against the first conversion: preconsonantal and word-final consonants are not uncontroversially codas. Furthermore, one position, intervocalic (V_V), cannot be subsumed under either environment, although a consonant is either in the onset or in the coda.[56] Thus, (28) cannot be labelled onset. This environment, Ségéral & Scheer argue, is, nevertheless, relevant, because this is the phonological strong position, that is, the position where diachronic phonological decay is rare and practically never happens to the exclusion of its mirror site, the coda. Its passivity is exactly why the position has gained little attention; but, as Ségéral & Scheer claim, resistance to phonological change in time is **112**

[55] At this point the discussion excludes the possibility of branching onsets. Thus (28) cannot be interpreted as the second—weak—position of such a cluster.

[56] I disregard the option that a consonant is extrasyllabic, all the more, since an intervocalic consonant is never assigned this status. It is often treated as ambisyllabic, this option, however, defies the assumptions about linguistic trees that nodes have one mother. It simply shows the analyst's lack of a better solution. For an extensive philippic against the notion, see Harris 1998 : 4ff.

much more peculiar in a system, natural language, which is subject to wholesale changes. Naming it coda mirror (cf. (28)), this strong position is what they set out to capture. I will use the same name to refer to the theory itself.

Ségéral & Scheer claim that the two forces driving lenition, the ab- **113**
sence of lenition and fortition are GOVERNMENT and LICENSING. The first is a destructive power reducing a position's ability to maintain melodic content, thereby reducing the range of segmental contrasts it can exhibit. Licensing on the other hand "backs up segmental expression": licensed positions are better at holding their melodic content. Both forces are directed right to left, i.e., the governor and the licensor is uniformly to the right of the governee and the licensee.

As already noted, the theory assumes strictly alternating C and V **114**
positions on the skeleton. It is phonetically interpreted V positions[57] that govern and license in the following way: a V position governs either the preceding V position if that is melodically empty or the preceding C position if the V it first tries to target is not empty. This is depicted in (30), where government is indicated by a blunt arrow, knocking the target; skeletal positions linked with a Greek letter contain some melody, others are melodically empty.

(30) a. $\begin{array}{ccc} \mathrm{V} & \mathrm{C} \Leftarrow & \mathrm{V} \\ & | & | \\ & \alpha & \beta \end{array}$ b. $\begin{array}{ccc} \mathrm{V} & \mathrm{C} \Leftarrow & \mathrm{V} \\ | & | & | \\ \alpha & \beta & \gamma \end{array}$

V positions also license, but this time the target is always the preceding **115**
C position irrespective of either its own or the preceding V's melodic content. In (30) this is indicated by the double arrow, again pointing towards the target.

[57] In the following displays an interpreted V position will be represented as one with associated melodic material. Note, however, that empty V positions, unassociated with any melody, may also be phonetically interpreted, hence be governors and licensors.

Unpronounced V positions are inert, i.e., they neither license nor govern.[58] The pronunciation of a V position is controlled by the ECP, introduced in (14). Recall that this principle lets those V positions remain unpronounced which are melodically empty and (i) properly governed — this is in fact the case of the first V position in (30a) —, (ii) word-final in certain languages, or (iii) enclosed in an onset-to-onset — that will be C-to-C in our terms — domain.[59] **116**

Given the interpretation of government and licensing in the theory, the following predictions are made about the phonological strength of consonantal positions: **117**

(31) STRONG POSITIONS are licensed and ungoverned
WEAK POSITIONS are either unlicensed or governed

For a position to be licensed, it must be followed by an active V position, that is, one which is pronounced. This immediately renders all traditional codas unlicensed, therefore weak, since they are either followed by another consonant or the end of the word (in both cases an unpronounced, hence inert V position in the present framework), but certainly not a pronounced V that could act as a licensor. For a C position to be ungoverned, it must either be followed by an inert V position or be preceded by an empty V position that absorbs the government coming from the V position following it. Since no C position can simultaneously be followed by an active V that licenses it and an inert V that does not govern it, the only way for a C position to retain its full strength is to be followed by an active V *and* be preceded by an empty V, the situation shown in (30a). This requirement is fulfilled by consonants in a C__V **118**

[58] A welcome effect of the different licensing properties of pronounced and unpronounced vowels is that nonprevocalic positions are formally distinguished from those followed by a weak vowel, providing a more plausible way of dealing with cases like s > h lenition in Spanish, which proved rather difficult for Licensing Inheritance.

[59] Some versions of GP talk about onset-to-onset governing domains, Scheer and Ségéral & Scheer have both government and licensing in different presentations of the theory. The difference is not decisive.

environment, i.e., C∅C̲V. Again ignoring the case of branching onsets,[60] we may say that onsets preceded by a coda, to use the traditional terminology, are in a phonologically strong position.

What is painfully not covered here, is word-initial position, where **119** lenition is again very rare. Motivated by totally independent analyses, Lowenstamm (in press) argues that the beginning of words (in at least Hebrew and French) is marked by the presence of a melodically empty CV sequence (also cf. section **5.2.2**). If indeed so, we get an explanation for the strength of the word-initial consonant position: it *is* preceded by an empty V, that of the word-initial empty CV pair, as shown in (32).

(32) $$\begin{array}{cccc} \underbrace{\mathrm{C} \quad \mathrm{V}}_{\#} & \mathrm{C} & \Leftarrow & \mathrm{V} \\ & | & & | \\ & \alpha & & \beta \end{array}$$

Word-initial empty CV pairs act as boundary markers: the abstract **120** phonological entity # can thus be identified as concrete phonological material, even if this is empty skeletal positions. Crucially, its effect — the absorption of government in this case — can be detected.

Weak positions, as we have seen in (31), are of two types: either **121** unlicensed or governed. Any C position followed by the ominous C or # disjunction is unlicensed. But even licensed positions are subject to lenition, whenever they are hit by the government emanating from the following vowel. (30b) indicates that this state of affairs occurs when both the following and the preceding V position are linked to some melodic material (and hence are pronounced), that is, in intervocalic position. The fourth logically possible status of a C position, governed and unlicensed, is logically impossible in this system, as this would require the position to be followed simultaneously by an active — governing — V and an inert — not licensing — V.

[60] In a nutshell, Ségéral & Scheer's story for branching onsets is the following: branching onsets involve infrasegmental licensing, that is, licensing below the skeletal level, between the relevant chunks of the melodic material. This configuration satisfies the need for government of the intervening empty position, therefore government may go through a branching onset, which thus behaves like a single consonant in this respect. This solution is discussed in more detail and criticized in section **6.2**.

Since the theory of consonant lenition — and, more generally, of 122
segmental representation — to be introduced in the next chapters is based on the Coda Mirror theory, I give a critical evaluation there. What remains to be done here is a comparison of Licensing Inheritance and Coda Mirror.

3.4 Licensing Inheritance versus Coda Mirror

In this section I briefly compare the two theories of consonant lenition dis- 123
cussed above, Harris's Licensing Inheritance and Ségéral & Scheer's Coda Mirror. To begin with, the scope of the two theories differ: Licensing Inheritance aims at incorporating a larger set of phenomena, including vowel reduction and phonotactic constraints; Coda Mirror wants to give an adequate formulation of the strong position, to show why consonants do not undergo lenition here and why they do elsewhere.

Although they work with different skeletons, there is considerable 124
agreement between them in the treatment of most coda consonants, the prime lenition site. The only discrepancy is with branching rhymes: Harris has them, Ségéral & Scheer do not. The devices which leave their fingerprint on representations in the form of lenition, among other things, are also partly identical, licensing for both theories and government for Coda Mirror.

Both theories assign a central role to the notion of licensing in sup- 125
porting melodic material. For Harris, licensing is a power that gradually decreases the further it gets from its original source. As we have seen, the head of every foot (every stressed syllable) must be taken to be such a source. For Ségéral & Scheer, on the other hand, the licensing of a consonantal position depends exclusively on whether the following vocalic position is pronounced or not. That is, licensing is a scalar property for Harris and a binary one for Ségéral & Scheer. Furthermore, Licensing Inheritance has gradually decreasing licensing at positions, but it never reaches the point where a position should be absolutely unlicensed. Coda Mirror has only the two extreme degrees of licensing, including the total lack of license, which means that this theory rejects the Phonological Licensing Principle. Assigning a very fine tuned sensitivity to the trigger of lenition appears to be unwarranted: in words like *competitive* Harris wrongly predicts a different degree of lenition for the two t's, cf. (27). Coda Mirror, on the other hand, does not make such a distinction and expects both consonants to behave identically. Harris is forced to have

"scalar" licensing for two reasons: (i) this is the only explanatory device for lenition in his theory and (ii) all positions must be licensed to some degree, because of the acceptance of the Phonological Licensing Principle.

Since all prevocalic consonantal positions are equally licensed in 126
Coda Mirror, another device is needed to produce intervocalic lenition. It is more elegant of Licensing Inheritance to accomplish both tasks by licensing, on the other hand, Coda Mirror applies a method used by both theories anyway: the destructive power of (proper) government.

The following chart compares the predictions the two theories make 127
in those environments that are standardly quoted as triggering lenition.

(33)

	LIC. INHERITANCE	CODA MIRROR
a. _#	lenition	lenition$_1$
b. _C	lenition	lenition$_1$
c. V́_V	lenition	lenition$_2$
d. V_V́	no lenition	lenition$_2$
e. V́C_V	lenition	no lenition

In this chart, the possibility of branching onsets is excluded, therefore any 128
preconsonantal consonant is a coda and any postconsonantal consonant is an onset head. It must also be noted about (33d) that although Coda Mirror predicts lenition in this environment, Ségéral & Scheer do not mean to assign any empirical validity to this fact. The reason is simply that in its present state the theory cannot tell why lenition is absent in this position.[61] I have nevertheless included this environment for the sake of completeness.

There are two further observations that can be made with respect 129
to this comparison. In (33a–c) we see that Coda Mirror distinguishes two types of lenition, caused by being unlicensed in the first two cases and by being governed in the last. Licensing Inheritance formally treats all cases of lenition alike. (33e) is a genuine case where the two theories differ in their predictions. Harris predicts that as far as lenition is concerned it makes no difference whether a consonant preceding an unstressed vowel is or is not preceded by another consonant, a single foot-internal onset is lenited just as one in a foot-internal coda–onset cluster. For Ségéral &

[61] Ségéral & Scheer (1999b) have a proposal to be discussed in section **7.1.1**, footnote 142.

Scheer, consonantal positions not preceded by a pronounced vowel are not governed, thus escape lenition, unlike postvocalic consonants. Deciding between the two theories in this respect is an empirical question, which we are going to return to in section **4.6.2**, ¶175. For a more elaborate comparison, the reader is referred to (97), in section **7.1.3**.

4 CODA MIRROR PLUS

In this chapter I propose various amendments to the Coda Mirror theory. Much of this is the result of work done together with Péter Dienes (cf. Dienes & Szigetvári 1999) in a theory we call VC phonology, completed here with further arguments and considerations. It has become very difficult, if not impossible, to pinpoint the source (him or me) of each idea and I will make no attempt. 130

I introduce and elaborate on details of the theory in two chapters containing two sets of partly independently marketable proposals. The present chapter is an attempt to make Coda Mirror capable of handling some commonly occurring phenomena that it has been unable to account for so far. The resulting theory is accordingly named Coda Mirror Plus. The next chapter discusses a consequence of Coda Mirror, the need for repartitioning the skeleton, which is most advantageous if the claims of Coda Mirror Plus are accepted, but — I believe — is worth considering even if one is not willing to buy these amendments, that is, without upgrading to the more recent version. 131

The chapter is organized as follows: first, I criticize Ségéral & Scheer's Coda Mirror theory, to anticipate the points where the proposed Coda Mirror Plus might supersede it (section **1**). (A part of the criticism is, however, postponed to the next chapter.) The next section (**2**) divides lenition types into two subsets, loss of stricture and loss of place. In section **3**, we are going to examine what the content of the C and the V positions on the skeleton is; this cannot be evaded in a theory working with such an impoverished skeletal organization. A section is devoted to examine the nature of government (**4**) and licensing (**5**), in the light of the development of those concepts in phonology. This is followed by an inventory of the relations between skeletal positions, in section **6**. 132

4.1 Flaws of Coda Mirror

As opposed to Harris's theory, where the only cause of consonant leni- 133
tion is the gradual weakening of prosodic and, resultingly, autosegmental licensing, in the Coda Mirror theory there are two separate causes. Similarly to the first theory, a position may fail to be licensed, but it may also suffer government. Recall that a consonant may never find itself in both of the detrimental states. We thus have two distinct lenition causes, unlicensedness and governedness. Ségéral & Scheer (1999a : 24f) claim that different types of lenition are observed in unlicensed and in governed position, an expected result if one believes that this is the *cause* of melodic loss. So Coda Mirror is capable of predicting the direction of lenition in different contexts — which Licensing Inheritance was not — , but it is not capable of saying why, say, devoicing is typically encountered in codas and not intervocalically and why, say, voicing is typically encountered intervocalically and not in codas (unless there is an external source, of course).

Coda Mirror, as all other theories applying a strictly alternating 134
CV skeleton,[62] represents any consonant cluster as a C∅C sequence, that is, two consonants that surround an empty vocalic position. This is a radical impoverishment of the expressive capabilities of other theories, a theoretically desirable development, which, nevertheless, threatens the descriptive adequacy of the theory: consonant clusters do exhibit varied behaviour as to where they prefer to occur in words. To handle such facts Scheer (1996, 1997) introduces the notion of infrasegmental government,[63] which separates branching onsets from other consonant clusters. This, however, is not enough: the remaining consonant clusters must also be separated. There is a clear division between clusters that prefer to stand in word-final position and those which do not, and, more notably, this division coincides (with some unevenness in, for example, Hungarian and English) with the division between clusters that do not

[62] A terminological convention was proposed by John Rennison at the Eighth International Phonology Meeting (Vienna, 1–3 November 1996) to distinguish Lowenstamm's (1996) theory that applies a $[\mathrm{CV}]^+$ skeleton from that of van der Hulst (1994, 1995), which reduces melodic primes to C and V. The author of the latter theory calls it Radical CV Phonology, Lowenstamm's was then dubbed Strict CV Phonology.

[63] This is the same device as Ségéral & Scheer's (1998) infrasegmental licensing, already mentioned above. I will hereafter use the latter, more recent term.

and those that do tolerate long vowels before them. To give some examples: on the one hand, *mp* is a possible word-final cluster in both English and Hungarian (e.g., *pump, komp* 'ferry'), while in neither does it tolerate a long vowel (or diphthong) before itself, on the other, *dl* is not possible word finally in either language, but tolerates a long vowel (e.g., *maudlin* mɔːdlɪn, *jódli* joːdli 'yodel'), while neither is possible word initially, so probably neither is an onset cluster. Coda Mirror is unable to account for this distinction.

Likewise, strict CV theories represent vowel sequences as V∅V, that **135**
is, two vowels that surround an empty consonantal position. This merges the representation of long vowels and hiatus. Again, this is empirically undesirable: long vowels are missing from before certain clusters in, e.g., English and Hungarian, but sequences of two unrelated vowels are not: **$\bar{V}$mb*—*VVmb* (e.g., *preamble* priæmbəl). The phonetic realization—*and* phonological behaviour—of a long vowel or diphthong also differs from that of two adjacent vowels with a hiatus between them (cf. the underlined sequences Hungarian *<u>au</u>tó* 'car' and *kal<u>au</u>z* 'guide', the intonation pattern of yes-no questions indicates that the *au* of the first may be one unit (syllable), *megjött már az* ↑ɒut↓oː*?* 'has the car arrived yet?', that of the second may not, *megjött már a* kɒl↑ɒ↓uz*?* (*k↑ɒl↓ɒuz) 'has the guide arrived yet?' (Nádasdy & Siptár 1989 : 15f)). Also the diphthong may be monophthongized: *autó* ɒːtoː, the VV sequence may not: *kalauz* *kɒlɒːz—at least not in my dialect. It is clear that what we need is a representation for long vowels and diphthongs,[64] which is different from that of two more or less accidentally adjacent vowels.

Ségéral & Scheer limit the scope of their theory to syntagmatic re- **136**
lations between skeletal positions, more specifically, they do not take higher prosodic properties of strings, like stress, into consideration. This way Coda Mirror has no means of saving a pretonic intervocalic consonant from government, and, as a result, from an expected lenition. Yet, in some languages (like English and Hungarian) intervocalic consonants behave radically differently depending on whether the preceding and following vowels are stressed or not (cf. Jones 1956 : 71f for English, Gráf 1999 for Hungarian; also see section **7.1.1**). It is these details of the theory that are amended by Coda Mirror Plus.

[64] Representing (at least some of) the diphthongs as VC sequences is a possibility which I do not pursue here.

4.2 Types of lenition

Ségéral & Scheer note the necessity of distinguishing two types of lenition **137**
trajectories, one of them typical of intervocalic position, the other of word-final and preconsonantal position. The first type may be captured under the heading sonorization or loss of STRICTURE (e.g., t > ɾ, t > d, d > n, t > s, s > r), the second can be generalized as loss of PLACE or LARYNGEAL specifications i.e., debuccalization, "delaryngealization" (e.g., t > ʔ, s/f > h, d > t, t^{h} > t).[65] Since the second type involves the loss of the place of articulation, some theories may be tempted to classify changes like ɲ > n, ʎ > l or l > ɫ[66] into the second type. It must be conceded that without a working model of melodic representation — I am going to sketch one rather superficially in chapter **8** —, it is hard if not impossible to convincingly argue for the distinction made here. I, nevertheless, include this section because the intuitions stated here will form an inherent part of the theory to be developed.

In Dienes & Szigetvári (1999) we assign the label VOCALIC LE- **138**
NITION to the intervocalic type and CONSONANTAL LENITION[67] to the word-final/preconsonantal type. I do not claim, because the data inhibit this, that the two sets of lenition phenomena are coextensive with the two sets of lenition environments. There may be found numerous counterexamples (as John Harris (*voce*) points out), cases where consonantal lenition is found in intervocalic position (e.g., t > ʔ in London English *city*) or vocalic lenition in word-final position (e.g., t > s in *get* in Irish and Merseyside English; Harris 1994 : 121). What I hope to be correct is that such offending cases do not occur exclusively in the "wrong" environment, i.e., if consonantal lenition occurs intervocalically it should

[65] Intervocalic voicing is probably not the opposite of word-final devoicing "melody-wise". Note that languages having no laryngeal contrast, i.e., having only one set of obstruents, very often have the voiceless variant word-initially and word-finally, and the voiced intervocalically.

[66] These changes also involve loss of some place feature, furthermore in unary-feature theories coronal underspecification means lacking any place specification (cf. Backley 1993, Szigetvári 1994), while in Standard GP it is velars that are placeless (empty headed).

[67] Note the necessity of distinguishing consonant lenition and consonantal lenition. The latter, together with vocalic lenition, is a subtype of the former: consonant lenition may be consonantal, that is, loss of place, or vocalic, that is, loss of stricture.

also occur word-finally and if vocalic lenition occurs word-finally it should also occur intervocalically. This is certainly true of the two cases mentioned here; whether all counterexamples follow the same pattern is an empirical question that needs future investigation.

4.3 The meaning of C and V

In a framework that has the simplest possible constituent structure on the skeleton — strictly alternating C and V positions — it is very important that one precisely defines what these two elements of the representation stand for. This is the topic of the present section. **139**

One of the first frameworks to use a skeleton is that of CV Phonology introduced by Clements & Keyser. They claim that the Cs and Vs of the skeleton fulfil two functions. On the one hand, they serve as timing units; as such they are but two labels for the same object, the ×'s of the skeleton, cf. (1). On the other, their Cs and Vs subsume "the function of the earlier feature category [syllabic]" (1983 : 10f), i.e., C is equivalent to [−syllabic], V to [+syllabic]. The first function of the skeletal slot seems evident: melodic material linked to a C or V position constitutes what is traditionally referred to as a segment, that linked to two Cs or two Vs simultaneously represents a geminate consonant or a long vowel, respectively. The quasi-melodic function, being the carrier of the feature [syllabic], is not so clearcut. Syllabicity is crucial for Clements & Keyser, whose ultimate aim is to produce a generative theory of the syllable. What they do, in fact, is representing the two values of a binary feature by two separate symbols, as if they were dealing with two unary features. The excuse for doing so obviously has to do with requirements of exposition: a skeleton of Cs and −Cs or −Vs and Vs would not be readily decipherable in their displays. **140**

In Dienes & Szigetvári (1999) we argue for the following interpretation: C positions host segments with consonantal properties and V positions host segments with vocalic properties, or rather, these positions add consonantal and vocalic properties, respectively, to segments they host. In fact, in many theories the acoustic properties of segments are partially defined by the position the rest of the melody is linked to. It is, for example, a phonological commonplace that the melodic representation of i and j and of u and w is identical, the difference between these two pairs is encoded solely in whether they are attached to a consonantal (onset or coda) or vocalic position (nucleus). This is, for example, **141** what it means in Clements & Keyser's theory to be linked to a C or a V, respectively. Rennison (1997) goes further along this line of thought by making use of the empty melodic element, claiming that if it is the head in a segment it transmits the inherent properties of the constituent the segment is hosted by. That is, an empty-headed segment in a consonantal position is interpreted as a prototypical consonant, a stop, while in a vocalic position it is a nonhigh vowel, more specifically, a, unless the segment is modified by other melodic material.

We are also following this path by making the assumption that the host of a segment — a V or a C — partly determines its melodic interpretation. We interpret the well-known discrepancy between the two extreme phonetic features, vocalicness and consonantalness, as follows. Vocalicness is loud, not only acoustically but also in the sense that V slots in the phonological skeleton aim at being pronounced. As opposed to this, consonantalness is mute, if nothing intervenes a C position will stay silent. This means that — unless there is some external influence — a V position will be pronounced, while a C position will not be. It would be somewhat odd if consonants were normally left silent. This is not the case because the lexical association of melody with a C slot *is* external influence, which normally overrides the slot's inherent affinity to silence.[68] An uninfluenced C position will, however, remain uninterpreted, accordingly, empty C positions need no special care like empty V positions, those at least that are not to be interpreted phonetically.[69] This suggestion is rather different from previous analyses including empty positions, where **142**

[68] Note that even if there is some melodic material available, like in the case of liaison consonants, cf. (4), without the association line that would link the C position to it, there is no speech signal. Such is the case is many liaison phenomena, a word-final consonant unassociated with the skeleton is pronounced only if followed by a vowel. The influence of this vowel is probably not that it licenses the preceding C position, but that it governs it. Consider French *petit* pəti(t) and *petite* pətit: both word-final C positions are unlicensed, yet the second one is pronounced, therefore licensing cannot be decisive in its interpretation. Government (in e.g., *petit enfant* pətitɑ̃fɑ̃) forces the interpretation of the C position (as discussed in the next section), consequently, the floating melodic material is linked to it. A more extensive discussion is given in section **5.4**, ¶237i.

[69] This difference between the status of empty C and empty V positions also explains that while there is some consensus about the phonetic interpretation of the latter — it is some central vowel, transcribed as ə, ɯ or ɨ —, that of the former is rendered by rather disparate symbols: from ɣ (Harris & Lindsey 1995: 67) through r (Backley 1993: 318) to ʔ (Rennison 1998: 234).

empty C positions were either not discussed at all[70] or just like empty V positions required proper government to remain silent (cf. Charette 1988 : 182ff and the next section). The muteness of C positions will also play an important role in our repartitioning of the skeleton in the next chapter. In the meanwhile, let me point out that even if associated with melodic content, the prototypical C position retains something of its inherent muteness: stops are the sudden cessation of the speech signal.[71] In a way then consonantalness and vocalicness seems to represent the two ends of the much used but little understood sonority hierarchy (cf. Cser 2000 and references there).

The prosodic excellence of V positions is indicated by the fact that they are inherently endowed with the power to license and govern other positions in their neighbourhood. Consonants can govern and license, too, but under much more limited conditions. The nature of these two forces is the topic of the next two sections. **143**

A further terminological clarification is in place here. Many current theories implicitly or explicitly take positions not *independently* licensing any melodic material to be empty. As opposed to this, I suggest that a skeletal position is empty if lexically it does not license any melody. So a position that licenses all of its melody in tandem with another is *not* empty. That is, the first consonantal position of a geminate or the second vocalic position of a long vowel is not empty. This is required by the fact that long vowels typically pattern with diphthongs and geminate consonants with coda clusters, the recessive positions of which are typically nonempty. This also means that I do not view a long vowel or a geminate consonant to necessarily be the result of a phonological process, say, spreading. **144**

[70] It is interesting to examine the ECP of standard GP theory—introduced in (14). The formulation is not neutral between emtpy onsets and nuclei: clauses ii (domain-final) and iii (within an onset-to-onset governing domain) are tailored exclusively for vocalic positions, clause i (properly governed) is also biased, since the definition of proper government, (15), only mentions nuclei, indeed, it is only nuclei, not onsets, that can ever be adjacent at some projection in the standard version of GP.

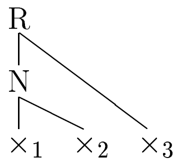
[71] John Harris (*voce*) objects that stops are in fact very noisy because of the burst at their explosion. Such stops are typically prevocalic, and their noise may be attributed to the influence of the following vowel under the rubric of licensing. Nonprevocalic stops sometimes totally lack this noise burst.

Before we proceed let me introduce the convention that I am often going to use for simplicity's sake: uppercase C and V denote a skeletal position with melodic content associated, also called full C or V for short; lowercase c and v[72] stand for empty skeletal positions, which are unassociated to melody. Normally, I retain the traditional uppercase symbols for cases where both full and empty positions are referred to, however, occasionally I will apply the symbols $\mathbb{C}$ and $\mathbb{V}$ for them. 145

4.4 Government

The notion of PROSODIC GOVERNMENT in phonology originates from Chomskyan syntax and is the result of the research programme that aims to find parallelisms between syntax and phonology, to support the idea that there is one Universal Grammar with several manifestations, including the syntax and the phonology of natural language.[73] Charette (1988) says Lowenstamm & Kaye (1985–1986 : 115)[74] are responsible for introducing the concept to phonology, originally as an explanation for closed syllable shortening: the superheavy rhyme in (21) — redrawn in (34) for the reader's convenience — is deemed ungrammatical because its head ($\times_1$) does not c-command and thus cannot govern the coda ($\times_3$); for a definition of c-command see, for example, Haegeman 1994 : 147. 146

(34)



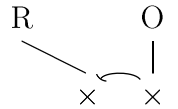
One of the further uses of government in phonology (e.g., Kaye & al. 1985, 1990, Harris 1990, Rice 1992) matches that of traditional grammar, where a head verb or preposition governs its complement: of 147

[72] The plural of this is *vs,* not to be confused with the abbreviation for *versus.*

[73] This goal is, of course, not unique to Government Phonology, one could haphazardly mention at least two other cases, the syntactic notion of STRICT CYCLICITY very soon was identified by Kiparsky's (1973) DERIVED ENVIRONMENT rules, while recently Optimality Theory, originally devised for evaluating phonological strings, was fast adopted to deal with syntactic phenomena.

[74] Charette mentions the 1982 manuscript of the paper, which, however, I have no access to.

adjacent segments the more prominent one, the head, is said to govern the other, its dependent. In doing so, the head imposes restrictions on the identity of the dependent, typically referred to as phonotactic restrictions in phonology (or case assignment in syntax). Consequently, in all of the theories mentioned government may be right-to-left — think of a coda governed by the following onset as in (35a) — or left-to-right — as in the case of a branching constituents as in (35b). It is the latter, but not the former, that bears a close resemblance to syntactic government. (For the sake of uniformity, I use the blunt arrow for government, though it may seem anachronistic here.)

(35) a.


b.


The necessary qualifications for becoming a governor depends on a segment's charm value (Kaye & al.), complexity, i.e., amount of melodic material (Harris) or paucity of sonorant voice structure (Rice). Under each account obstruents will make good governors, sonorants good governees. **148**

Another instantiation of government is applied to silence certain empty positions. This notion is again from syntax, where representations involving a trace, a type of empty category, are grammatical only if the trace is properly governed. The phonological implementation of the idea is more removed in this case; there is no possibility of c-command between successive vocalic positions of the phonological skeleton, there is no relationship between the two positions, that of the governor and the governee, like sharing a constituent or the governor being the coindexed maximal category of the governee in any sense. Proper government then is a force that inhibits the surfacing of skeletal positions. This function of government is overwhelmingly used to account for unpronounced vocalic positions, properly governed empty onsets are rarely mentioned in analyses; Charette (1988 : 182ff) is one of the rare exeptions.[75] **149**

Ségéral & Scheer unify the two notions. They claim that it is the same force that governs the empty vocalic position in a vCV string as what governs the consonantal position in a VCV string. Charette (1998) uses proper government in a very similar fashion, what distinguishes her solution are two things: (i) she applies it only to empty positions, **150**

[75] It was Wiebke Brockhaus who has called my attention to this fact.

whereas Ségéral & Scheer require emptiness only for the vocalic position and (ii) the order of precedence is different in Charette's analysis, in a vcV string the consonantal position is empty and claims the proper government originating from the V, leaving the preceding empty v ungoverned and forcing it to be pronounced (*rehausser* is rə.ose, not *r.ʔose or *r..ose, where the dots stand for empty positions).[76] In Coda Mirror it is the vowel that is first examined, if empty it is governed and it lets government hit the intervening consonantal position only if contentful and hence ungovernable. In both cases the choice between the two possible targets is exclusive, a vocalic position may govern at most one other position. In addition, in Ségéral & Scheer's theory a vocalic position *must* govern *exactly one* other position, if not the vowel then the consonant.

Recall that government in Coda Mirror is seen as a destructive force 151
that inhibits segmental expression, that is, it blocks the autosegmental licensing of melodic material. There are two difficulties with this definition. On the one hand, if government is a counterforce of licensing—one of them inhibiting, the other supporting the maintenance of melody—we expect similar outcomes for the two types of lenition, being governed or unlicensed, since the manifestation of both is loss of melodic contrastivity. Yet this is far from what we find, as Ségéral & Scheer themselves note (cf. section **4.1**). The other problem is that this formulation of government is strongly dependent on a particular set of theories of melodic representation, which assume that phonological lenition is exclusively capturable as loss of melodic content. I am not trying to deny the validity of this claim here, I simply note that the alternative definition of government to be proposed presently is such that it is also reconcilable with competing theories which posit a richer melodic structure for sonorants than for obstruents (e.g., Rice 1992).[77]

The interpretation of government to be used in Coda Mirror Plus 152
is given in (36).

(36) Government spoils the inherent properties of its target.

[76] This may not be a genuine difference, being bimorphemic *rehausser* is not a decisive argument for Charette's claim that government first targets the preceding C and only if that is not empty will it proceed to the preceding V position.

[77] One may claim that such liberty is a symptom of theoretical weakness. Perhaps this is so, but in lack of a fully acceptable theory of melodic representations, one must play it safe.

What this means is the following: a governed C position loses its inherent muteness, it loses stricture properties, and becomes louder, that is, more vowellike, more sonorous: it undergoes vocalic lenition. On the contrary, a governed V position loses its inherent loudness to become consonantlike, that is, silent. There are two further comments to be added to the definition of government in Coda Mirror Plus: one is that there is an asymmetry between the effect of government hitting a C and a V position. The content of a C position *may* lose *part of* its stricture characteristics, becoming vowellike is gradual. On the contrary, a governed V position can do but one thing, become mute, the effect of government in this case is absolute. This difference must probably be attributed to the fact that there is no melodic restriction on C positions becoming governed — they may be full or empty —, a V position on the other hand must be empty in order to be governable. Note also that this definition of government takes the first step towards rendering the phonological ECP (worded in (14)) superfluous and, in addition, it provides a principled way of dealing with empty consonantal positions as well.[78] **153**

4.5 Licensing

The notion of licensing is used in several partly overlapping, partly contradictory senses in phonology. (i) A position's license may mean that its own existence in the representation is justified; the structure, as far as that particular position is concerned, is grammatical. The Phonological Licensing Principle, introduced in section **3.2**, ¶95, is a manifestation of this interpretation, its job is to make sure that ungrammatical prosodic structures are filtered out. To give it a name, it may be identified with PROSODIC LICENSING. (ii) A position is also said to be licensed by the ECP to remain inaudible, that is, word-final empty nuclei are licensed in certain languages, properly governed empty nuclei are licensed in others, etc. This meaning has lead to some confusion — noticed by Brockhaus **154**

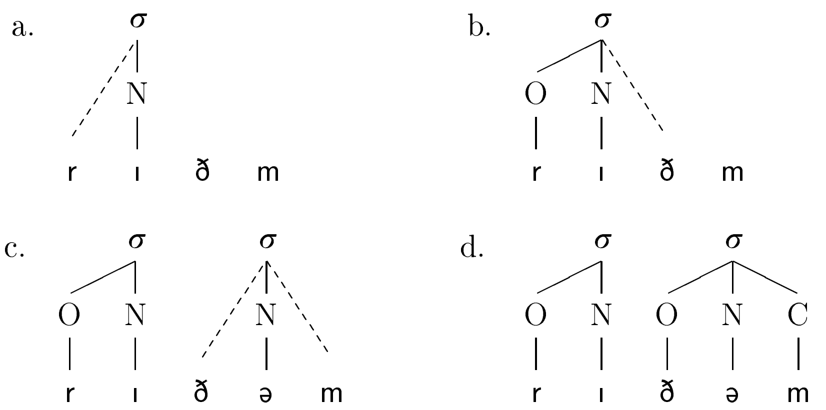
[78] The definition in (36) has taken the notion of government quite far from what it used to mean in Chomskyan syntax and early Government Phonology. One may wonder what justifies retaining the label for something so different. The following may be brought up as an excuse: reverence for preceding theories — after all, as I have shown, there is a direct descendancy for the notion —, lack of creativity to invent some more transparent name and the malicious, anarchistic joy one feels upon reading this definition.

(1999 : 208, fn. 22), also hinted at in section **2.3** (footnote 24), with respect to the definition of proper government in (15) — , namely, that a position may be licensed$_{\text{i}}$ to exist, but unlicensed$_{\text{ii}}$ to remain inaudible. Licensing of this type has nothing to do with grammaticality: it is perfectly okay to have unlicensed$_{\text{ii}}$ empty nuclei, which are forced to become audible according to the language specific interpretative conventions concerning empty vowels (i.e., such a position will be pronounced ə, ɯ, or some other vowel dictated by, for example, vowel harmony). (iii) Furthermore, a position may be licensed to head other positions. For example, it is a language specific issue whether word-final consonants are licensed to be the head of, i.e., to govern in GP, a previous coda consonant. If they are, certain word-final consonant clusters will be attested; if they are not, only single consonants will appear at the end of words. This sense of licensing is standardly referred to as GOVERNMENT LICENSING (cf. Charette 1992), hence causes no confusion. (iv) Finally, each position needs license to maintain the melodic material associated with it, thereby to support its contrasting capacity. Those with a good memory will recall that this is AUTOSEGMENTAL LICENSING.

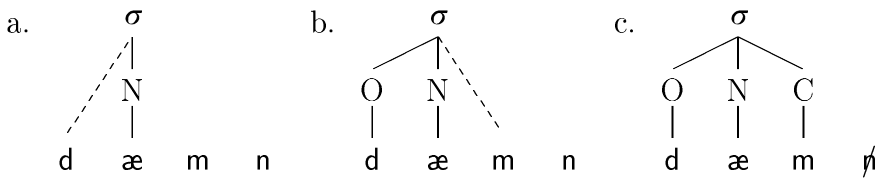
Harris explicitly claims that autosegmental and prosodic licensing **155**
are the same force involved in two different kinds of activity (1997 : 336). He also unifies these two facets of licensing with government licensing (1997 : 363f). Thus it is only licensing of type (ii) that ought to be found another name. As we are going to see, *dead* will be the appropriate term in Coda Mirror Plus. It is, nevertheless, useful to keep the distinctions, since licensing does assume a number of different functions in the organization of the phonological representation.

The idea of prosodic licensing originates in theories that apply syl- **156**
labification rules to segment strings of the lexicon into syllables. If any portion of the string is left unsyllabified because it cannot be incorporated into any syllable, it remains unlicensed and therefore either some auxiliary mechanism — typically vowel insertion — comes to rescue it or it is subject to stray erasure. Consider the two strings rɪðm and dæmn[79] emerging from the lexicon (of English). In the first case syllable structure is built as in (37).

[79] What justifies these representations are the derivates rɪðmɪk (*rɪðəmɪk for *rhythmic*) and dæmneɪʃən (*dæmeɪʃən for *damnation*).

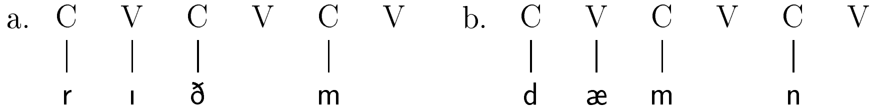
(37)


In the underlying string there is only one vowel, which will serve as the starting point for building syllable structure. The first stage is incorporating the prevocalic consonant, (37a). During the next stage, the incorporation of the postvocalic consonant(s), (37b), the algorithm discovers that it cannot incorporate all the skeletal points (here represented by the IPA symbols that also abbreviate the melody linked to the points) into one syllable. An extra vowel, ə, is inserted, (37c)—violating monotonicity—, which again projects a syllable node, the ð is resyllabified from the coda and, eventually, two well-formed syllables are formed, (37d). Crucially, the final m is incorporated into the prosodic hierarchy, thus it becomes licensed and escapes deletion. The other option is depicted in (38). 157

(38)


In this case, we do not encounter vowel insertion, instead the final consonant remains unparsed. Not being linked to the prosodic structure it fails to be licensed and remains uninterpreted. 158

Prosodic licensing, illustrated above, is superfluous in strict CV frameworks. (39) shows how the same two strings are matched with strict CV skeletons. 159

(39)


There is no vowel insertion: the V position flanked by ð and m is sim- 160
ply not properly governed — the final V, which is empty, is unable to do this — , hence it may not remain uninterpreted, it is pronounced. (Note that it would be misleading to attach a schwa to the skeletal position between ð and m, since there is no melody linked to that position, underlyingly or at the surface. It is a position lacking any melodic material that is interpreted as the unmarked vowel.) As opposed to this, in *rhythmic* rɪðmɪk the second vowel takes care of the empty position, as shown in (40).

(40)	C	V	C	V	C	V	C	V
	|	|	|		|	|	|	
	r	ɪ	ð		m	ɪ	k	

Vowel insertion or vowel deletion is thus apparent: all that happens is 160a
the interpretation of a V position or lack thereof. Why the situation is solved differently in (39b) requires a different account, but the same is true for the analysis involving the syllable building algorithm. This issue will be pursued further in section **6.3.1**.

In a sense, every position is licensed prosodically in both (39a) and 161
(39b). C positions are all followed by a V position that licenses them prosodically. With strictly alternating Cs and Vs, there is no possible surprise about what comes next on the skeleton. What must be licensed, however, is the nonpronunciation of some empty vocalic positions, on the one hand, and the melody linked to each skeletal position, on the other. The first type of licensing (referred to as type ii in this section) is controlled by the ECP, the second type — autosegmental licensing — is related to prosodic licensing: licensed positions are better at keeping their melodic content, but an unlicensed position may just as well remain associated to all the melody it is lexically furnished with. As we are going to see (**7.2.2**), symptoms of government licensing may also be recognized in Coda Mirror Plus. In section **5.5** I will reintroduce the vestiges of prosodic licensing providing it with a new function.

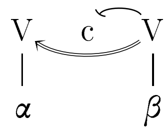
4.6 Relations between skeletal positions

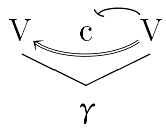
Both licensing and government are directional, that is, the target is always on the same side of the trigger. This axiom again follows Coda Mirror and is unlike that of Standard Government Phonology, where government is claimed to be strictly directional but the constraint is evaded by multiplying the number of government types (constituent government is head-initial, interconstituent and proper government are head-final, the direction of other types of government on the nuclear projection is language specific — these are not covered by Coda Mirror (Plus)). Both forces are local, that is, the target is always adjacent to the trigger. At this point in the discussion, adjacency must be interpreted as the following: governor and governee on the one hand, licensor and licensee on the other may not be more than two skeletal positions away from each other, that is, a category governs/licenses the nearest possible category of the given type to its left, i.e., if a position of type X is to govern/license a position of type Y this must be the immediately preceding position, if it is to govern/license a position of type X this must be the one two positions away. In section **5.6**, we are going to see how this axiom can be reduced to genuine adjacency. GP's way of evading strict locality is by positing an unlimited number of projections, on which the relevant positions are undeniably adjacent. Coda Mirror does not explicitly adhere to locality, but relaxes it in only one case, that of branching onsets. In addition, however, this theory cannot reduce the maximally-two-positions-away axiom to genuine adjacency. It can be concluded that the theoretical devices as defined by Coda Mirror Plus are the most restrictive of the competing models: government and licensing are both universally and exceptionlessly unidirectional and local. Furthermore, each position has exactly one load of government and one of licensing power, like in Coda Mirror, but unlike in Harris's theory, where, recall, many nuclei license both another nucleus and the preceding onset. **163**

Following Ségéral & Scheer (1998), in Dienes & Szigetvári (1999) we claim that V positions license the preceding C position and govern either the preceding V position, if that is empty, or the preceding C position, if not (cf. (30)). This capability is an inherent property of V positions, that is, V positions govern and license unless they suffer some unfavourable external influence. Government is unfavourable external influence: governed V positions fail both to license and to govern preceding skeletal positions. **164**

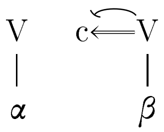
4.6.1 V-to-V licensing

We extend the scope of licensing: a V position *may* license the preceding 165
V position, provided that the intervening C position is empty and not licensed by the V. Two manifestations of this configuration are depicted in (41), where redundantly emptiness is marked both by the absence of association to melody and a lowercase letter on the skeleton.

(41) a. 

b. 

V-to-V licensing is subject to melodic restrictions and it is language spe- 166
cific: whereas the previous three configurations—V-to-C licensing, V-to-V and V-to-C government—are universally present in all languages, this one occurs in some and not in other languages. The notational convention that the arrow goes around the intervening skeletal position *below it* is used because in this configuration the enclosed position is necessarily unassociated to melody, hence the arrow will not cross any association line, in fact, it graphically blocks their emergence. Such underarrow configurations are dubbed BURIAL DOMAINS, the empty skeletal position surrounded by such a domain is BURIED. We claim that being buried has identical results as being governed, more details on this below. Note that a VcV portion of the skeleton does not necessarily constitute a burial domain, the relations may also be like those in (42).

(42) 

The formal difference between the configurations in (41) and (42) is the 167
absence of V-to-V communication in the latter. This means that the two V positions in (41) are interdependent, while there is no relationship

between them in (42). Thus, (41a) is the representation of diphthongs,[80] (41b) of long vowels and (42) of hiatus. Note that there is pressure for hiatus filling in (42), the fact that the c position is governed forces it to abandon its inherent muteness.

Unconstrained, the machinery proposed makes the configuration 168
in (43) possible.

(43) $V_1 \quad c \quad V_2 \quad c \quad V_3$

α

The triple cluster in (43) is supposed to be the representation of an 169
extra long vowel, e.g., aːː. In section **1.1**, ¶11, I claimed that such three-long segments do not appear to occur contrastively in natural language. Autosegmental phonology, per se, has no way to exclude them, and it is also rather counterintuitive in the present theory to claim that a licensed V position, V_2, loses its licensing potential. To be able to asterisk such clusters, I propose the stipulation in (44).

(44) The Burial Constraint

Burial domains may not share a skeletal unit.

The structure in (43) violates this constraint: the middle unit, V_2, is 170
simultaneously part of the first burial domain defined by V_1 and V_2 and of the second, V_2 and V_3. The necessity of this constraint stems from the fact that the notion of headedness is dispensed with in Coda Mirror Plus—and in Coda Mirror for that matter. A licensing V position is *not* the head of its licensee, nor vice versa. Accordingly, there is no built-in limit for clustering in this theory, stipulative constraints, like the one in (44) have to be set up.

[80] Péter Siptár (*voce*) points out that it is the second part of the diphthong that licences the first, contrary to traditional assumptions. This is because licensing, as used in this theory, has nothing to do with prosodic licensing: it is not heads that license dependents. The autosegmental strength of positions, i.e., the amount of melodic material they can sustain, depends on whether they are licensed and ungoverned, where the licensing comes from is immaterial. This is rather different from Harris's licensing; also cf. section **5.5**.

4.6.2 C-to-C government

The chart in (45) compares the relative positional markedness of three 171
different types of consonant clusters. The numbers represent the degree of markedness in the given position, the greater the number, the more marked the given cluster in the given position. By positional markedness I mean the following: a cluster α is positionally more marked than a cluster β if α does not occur in a given position to the exclusion of β, that is, there is an implicational relationship between the two clusters such that if α occurs in a given position then β also occurs there. The numbers have significance only within their row and within their column, i.e., I do not intend to claim that an intervocalic *tk*-like cluster is less marked than a word-initial *tr*-like cluster, although the first is assigned '2', the latter '3'. What is claimed is that of word-initial clusters the *tr* type is the least marked etc., but this type is least marked intervocalically. The mnemonic labels for the clusters, represented by a typical exemplar in the chart, are ONSET CLUSTER for (45a), BOGUS CLUSTER for (45b) and CODA CLUSTER for (45c). It is hopefully needless to say that the first are branching onsets, the last coda–onset clusters in GP. The name bogus cluster comes from Harris (1994 : 67), who uses the term for CvC clusters, where, according to the standard assumption, there is no relationship between the two parties (but cf. **6.3.1**).

(45)

		#_V	V_V	V_#
a.	tr	3	2	4
b.	tk	4	2	5
c.	rt	4	0	1

Onset clusters word-finally are less marked than bogus clusters because 172
there exist languages (e.g., French) that have the former but not the latter. I know of no system with the opposite situation, but this presupposes that marginal exceptions (like certain unique Hungarian place names, e.g., *Detk, Batyk* -ck*, Recsk* -ʧk*, Szakcs* -kʧ) are disregarded lest any analysis should become impossible.[81]

Because of their different behaviour, at least these three different 173
cluster types call for different treatment. Strict CV frameworks posit the

[81] Péter Rebrus (*voce*) suggests that place names (in Hungarian) have a prosodic template of their own. Perhaps they are bimorphemic.

same skeletal representation, CvC, for all of them, therefore the only possibility of making a distinction is positing different relationships between the skeletal positions involved. To handle this task, in Coda Mirror Plus it is not only V positions that have the ability to govern but also C positions. Theoretically this is somewhat undesirable, since of Cs and Vs it is obviously the latter that qualify as heads, thus a C has to govern across a head. Yet having C-to-C government across the more prominent V position is not a novel thing: onset-to-onset government in GP is an implementation of the same idea. In both theories, however, the possibility is only available if the intervening head is melodically empty. Rebrus (forthcoming) entertains the same idea for representing coda clusters, claiming that the C-to-C governing domain licenses (in the sense 'license to remain inaudible') the intervening empty V—and also the preceding C, since he retains the Phonological Licensing Principle.

C-to-C government is depicted in (46). This is the representation proposed for coda clusters. The configuration is a burial domain similarly to V-to-V licensing, hence the buried v position behaves identically to a governed v position. C-to-C government may only be established over an empty v position; like it is only an empty v that is eligible for being the target of government, it is only an empty v that is eligible for burial. Because of their identical properties governed vs and buried vs are jointly referred to as DEAD vocalic positions. As can be guessed, positions which are neither governed nor buried are ALIVE. The blunt arrow again goes below the buried skeletal position. 174

(46)
$$\begin{array}{ccc} C & v & C \\ | & & | \\ \alpha & & \beta \end{array}$$

Like with V-to-V licensing, the creation of a C-to-C governing domain is also subject to melodic conditions and is language specific, not all languages allow this configuration, i.e., not all languages have codas, or branching rhymes as GP would put it. Furthermore, it is only ungoverned C positions that may govern. This condition is met even if the cluster is followed by a pronounced vowel: the buried v position surrounded by 175 the two portions of the cluster is always there to receive the potential government coming from the following vowel, as shown in (47).[82]

(47)
```
C   v   C⇐V
|       |  |
α       β  γ
```

Interestingly, there are languages where C positions need no license 176
to govern, in these languages we find nonprevocalic coda clusters, as well as others that are followed by a pronounced vowel. The latter type, C v C⇐V, is the default case, unlicensed governing C positions are marked. I will return to the issue in more detail in section **7.2.2**.

The Burial Constraint of (44) also constrains C-to-C government, 177
ruling out double coda clusters, like rnt, and in the extreme case three-long geminates, like t::.[83] The operation of the constraint in the case of adjacent V-to-V and C-to-C burial domains will be discussed in section **7.2.5**, after the identity of the skeletal unit has been explicitly defined.

C-to-C government is posited as the representation of coda clusters, 177a
the coda–onset clusters of GP. As we are going to see, in bogus clusters the intervening empty v position has to be governed, but the representation of onset clusters will prove rather problematic, as discussed in chapter **6**.

[82] With the hypothetical stipulation that buried vowels are not governed, Coda Mirror Plus could simulate the functioning of Licensing Inheritance, recall, in that theory post-coda positions are subject to lenition. If buried positions rejected government post-coda C positions would be governed. This is probably undesirable.

[83] In lack of a plausible alternative, the constraint will have to be suspended for a small set of CCC clusters in English. More problematically, the claim that only ungoverned C positions can govern is also untenable in their case. The issue is discussed in section **7.2.4**.

4.6.3 Government restricted

Up to this point we have assumed that in the configuration in (48) the full vowel will necessarily govern the empty one. **178**

(48) $$\begin{array}{ccc} \mathrm{v} & \mathrm{C} & \mathrm{V} \\ & | & | \\ & \alpha & \beta \end{array}$$

This expectation is disappointed. It appears that in certain cases a full vowel cannot govern the preceding empty vowel. Consider the English data presented in (49) on the next page.[84] The list of forms is meant to be exhaustive, that is, I have listed almost all[85] pronunciations judged possible for RP by Wells (1990). **179**

Evaluating these data is not at all trivial. The many alternatives seem to indicate an ongoing change in the system, with the three stages əC, C̩ and ∅C, that is, in getting to the last, syncopated form, strings go through a stage with a syllabic consonant. As is often the case in phonological change the relative frequency of the lexical item seems to play some role in how far the process gets, for example, *Lebanon* and *megara* are obviously less often used items than *separate* and *memory.* Disregarding such interferences, what we see is summarized in (50).

(50) a. all of the items of (49) have a schwaful form;
b. some of the item of (50a) also have a schwaless form with a syllabic consonant
c. some of the items of (50b) also have a syncopated form
d. there is no syncopated form without a corresponding C̩-form
e. all items that do not make it to the C̩-stage have a strong vowel following the potential syncope site
f. all items that make it to the ∅C-stage (syncope) have a weak/ reduced vowel following the syncope site

[84] Burzio's (1994 : 61) attention to this phenomenon is called by Michael Kenstowicz. His example is (49d). Burzio's explanation is that syncope would produce a monosyllabic foot in *(memø)rize,* which it does not in *(memøry),* feet parenthesized.

[85] There is one exception: the variant ˌsəʊʃiˈɒləʤi for *sociology* is omitted. It would not have fitted the chart and the s∼ʃ difference is beside the point anyway.

(49)	a.	Lebanon	ˈlebənən	∼ ˈlebn̩ən	
			ˈlebənɒn		
		Lancelot	ˈlɑːnsələt	∼ ˈlɑːnsl̩ət	∼ ˈlɑːnslət
			ˈlɑːnsəlɒt		
	b.	megaron	ˈmegərɒn		
		megara	ˈmegərə	∼ ˈmegr̩ə	
	c.	separate$_a$	ˈsepərət	∼ ˈsepr̩ət	∼ ˈseprət
		separate$_v$	ˈsepəreɪt		
	d.	memory	ˈmeməri	∼ ˈmemr̩i	∼ ˈmemri
		memorize	ˈmeməraɪz		
	e.	rational	ˈræʃənəl	∼ ˈræʃn̩əl	∼ ˈræʃnəl
			ˈræʃənl̩	∼ ˈræʃn̩l̩	∼ ˈræʃnl̩
		rationale	ˌræʃəˈnɑːl		
	f.	fatal	ˈfeɪtəl	∼ ˈfeɪtl̩	
		fatalist	ˈfeɪtəlɪst	∼ ˈfeɪtl̩ɪst	
		fatalism	ˈfeɪtə˳lɪzəm	∼ ˈfeɪtl̩˳ɪzəm	
		fatalistic	ˌfeɪtəˈlɪstɪk	∼ ˌfeɪtl̩ˈɪstɪk	
	g.	cycle	ˈsaɪkəl	∼ ˈsaɪkl̩	
		cycling	ˈsaɪkəlɪŋ	∼ ˈsaɪkl̩ɪŋ	∼ ˈsaɪklɪŋ
	h.	cynical	ˈsɪnɪkəl	∼ ˈsɪnɪkl̩	
		cynically	ˈsɪnɪkəli	∼ ˈsɪnɪkl̩i	∼ ˈsɪnɪkli
	i.	social	ˈsəʊʃəl	∼ ˈsəʊʃl̩	
		sociology	ˌsəʊsiˈɒləʤi		
	j.	medial	ˈmiːdiəl	∼ ˈmiːdjəl	
		mediate	ˈmiːdieɪt		
	k.	Catalan	ˈkætəlæn	∼ ˈkætl̩æn	
			ˈkætələn	∼ ˈkætl̩ən	
	l.	analogue	ˈænəlɒg	∼ ˈænl̩ɒg	
		catalogue	ˈkætəlɒg	∼ ˈkætl̩ɒg	
		monologue	ˈmɒnəlɒg	∼ ˈmɒnl̩ɒg	
	m.	buffalo	ˈbʌfələʊ	∼ ˈbʌfl̩əʊ	

The obvious choice for a device causing vowel syncope in these forms is 180
proper government. Thus we have to conclude that weak vowels appear to be able to govern a preceding vocalic position, but more prominent vowels do not. What is peculiar is that one would think the more prominent a vowel is prosodically, the more power it has to govern. A metrical phonologist may formulate the restriction by reference to grid clash or

stress clash: the result of syncope in a V́CVCV́ string would render two stressed syllables adjacent. Syncope, however, is also impossible if there are two unstressed syllables between stresses (e.g., *hùllabalóo* *ˌhʌləbə̸ˈluː, *mèthodológical* *ˌmeθədə̸ˈlɒʤɪkəl), the grid-clash explanation is not applicable to this case.

To explain the situation, I propose a restriction on government formulated as (51), call it the ANTIPENETRATION CONSTRAINT. 181

(51) The Antipenetration Constraint

Government cannot penetrate a stress domain.

A STRESS DOMAIN[86] is a string of pairs of Cs and Vs[87] containing at least one pronounced V and extending up to, but not including, a stressed V. Despite its name, a stress domain may lack a stressed vowel, a possibility occurring at the beginning of words. The stress on the V that initiates a new stress domain may be of any degree, even so-called tertiary stresses qualify. 182

It is fairly uncontroversial that the adjective *separate* (ˈsepərət) is one foot, while (ˈsepə)(reɪt) is two (cf. Burzio's account of **memørize* in footnote 84). The empty phonological position in the syncope site may only be governed by a V position within the same stress domain. This is the case in the examples in the last column of (49). For those items that have only schwaful pronunciations, on the other hand, the V position that could govern the syncope site is in a different stress domain — in fact, it is the head of its own foot. (52) is provided to visualize the situation in *separăte* and *separāte.* (The final diphthong of the second item is depicted as a short vowel to have two uniform skeletons, what is relevant is only that it is not a weak vowel.) 183

[86] I use the term "stress domain" instead of the more common "foot" to strip the notion of its collocations. For example, while feet may be iambic — though the option is not uncontroversial —, stress domains may not.

[87] I am deliberately not using the phrase "CV units" here, chapter **5** will answer why.

(52) a. c v (C$\Longleftarrow$V C v C$\Longleftarrow$v C v)
s e p r t

b. c v (C$\Longleftarrow$V C$\Longleftarrow$v) (C$\Longleftarrow$V C v)
s e p r eɪ t

The parentheses enclose stress domains. Here they are conceived of as being made up of CVs, if the boundaries were after the Cs the situation would be the same. Whether the word-initial empty CV pair is part of the first stress domain or not is also immaterial; it certainly is not a stress domain in itself — recall stress domains must contain at least one pronounced vowel —, hence government may penetrate it and attack its v. The dashed line in (52b) represents attempted government which is frustrated by the restriction in (51): it would penetrate a different stress domain. The same attempt succeeds in (52a), resulting in syncope. Ungoverned (and unburied) empty v positions must surface (note, however, that the final v sneaks out of this generalization), hence (52a) is interpreted as ˈseprət,[88] (52b) as ˈsepəreɪt. 184

The Antipenetration Constraint of (51) appears to be a manifestation of the STRICT CYCLICITY CONDITION, which encapsulates the observation that certain phonological domains may not be externally influenced. An analogous situation arises with the word domain as well: cf. *fatal#ist* ˈfeɪtəlɪst or ˈfeɪtl̩ɪst, but *ˈfeɪtlɪst.[89] The constraint does not explicitly aim at inhibiting strong-limbed vocalic positions from governing their weaker colleagues: strong Vs happen to be the first in a stress domain and it is purely coincidental that government propagates from right to left, therefore the potential target is often in a different domain. 185

As for why government may be inoperative even in cases where everything is fit, i.e., why ˈsepərət is possible, one could argue that the 186

[88] In its present state Coda Mirror Plus can only cope with the optionality of vowel syncope in sepərət/seprət by assuming two lexical representations. What it does account for is the impossibility of schwa deletion in ˈsepəreɪt.

[89] While it has to be admitted that the situation looks more complex, e.g., *cycl# ing* may be ˈsaɪklɪŋ too, furthermore, *cyclist* is only ˈsaɪklɪst and *cycl+ic* is also *ˈsaɪkəlɪk; the contrast still holds and has to be explained. The unexpected solutions may be attributed to the nonuniformity of the morphological concatenations involved.

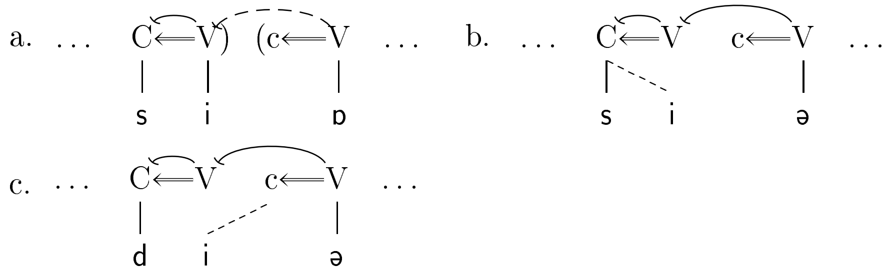
middle vocalic position is not totally empty, and only if it loses all its melodic content is government operative. This suggestion is rather feeble and is countered by another well attested phenomenon, high vowel gliding, which is to be discussed further below. Another, more plausible answer is that governing and licensing relations are given lexically: in ˈsepərət government links the rə sequence, in ˈseprət the two empty vs pronounced as ə in the other form.

187 The conditions for syllabic consonant formation are difficult to decipher from the data. The fact that this process is possible word-finally suggests that no external influence — I am thinking of government and licensing — is necessary for this configuration to be sustained: recall that both government and licensing are unidirectional, hence a word-final consonant is always ungoverned and unlicensed — at least this is what follows from Coda Mirror, since uninterpreted vs neither govern nor license. The observation is corroborated by (49f–h, k–m): here we find syllabic consonants before prosodically prominent or heteromorphemic vowels, neither of which appear to be particularly easy governors of the site of syllabic consonant formation as the Antipenetration Constraint and other manifestations of Strict Cyclicity predict. The absence of the phenomenon in (49a–e) is probably attributable to the wholesale indeterminacy of how far the process gets in individual lexical items — and also of how much Wells decides to record of this. In the case of syllabic consonant formation the vocalic interpretation of the V position is suspended, but only in case the following C position is occupied by a segment that is interpretable in the V position too.[90] To conclude: syllabic consonant formation is not dependent on any specific government or licensing configuration. What it is constrained by is the identity of the consonant preceding the site. I will return to this issue in section **6.3.1**.

188 The comparison of the data in (49i, j) points to an unexpected phenomenon. It appears that a nonempty vocalic position is suppressed it this case. Let us examine (53).

[90] The property of being interpretable in the V position is language specific. In everyday terms this means whether the system has syllabic consonants or not. Furthermore, it depends on the melodic content of the preceding C position too, cf. *Simon* *saɪmn̩, *phylum* *faɪlm̩.

(53)



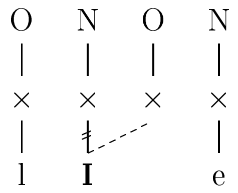
(53a) represents the underlined portion of *sociology,* (53b) that of *social,* (53c) that of *medial.* Government is again impossible when it would intrude into another stress domain, (53a).[91] What is surprising in these cases is that government appears to attack a V position which contains melodic material. The melody thus ousted of the V position is rescued by either the preceding — in *social* -ʃə-,[92] (53b) — or the following — in *medial* -djə-, (53c) — C position. One could argue that *social* is simply a bisyllabic string and in the absence of a form ˈsəʊsiəl it is anachronistic to posit the representation in (53b) to it. The synchronic alternation in *medial* (-diə- vs. -djə-) is still there to convince the doubtful that a nonempty V occasionally suffers government. **189**

Facing a similar problem in connection with glide formation in the French past participles *lié* lje 'fastened', *loué* lwe 'let', *sué* sɥe 'sweated' etc., Haworth (1994)[93] and Charette (1998) offer a surprising solution. They claim that the high vowels i, u and y (cf. the 3rd person forms *lie/lient* li, *loue/louent* lu, *sue/suent* sy) leave the nucleus for the onset between the two nuclei, as shown in (54), using *lié* for illustration. **190**

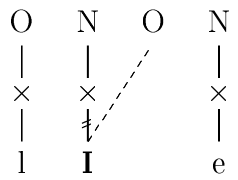
[91] Counterexamples always crop up, cf. the General American form *famíliarity* fəˌmɪlˈjærəri this time. It is noteworthy that GA forms exhibit a greater preference to syllabic consonant formation too, for example, monomorphemic pretonic occurrences of the process are much more common in this dialect than in RP: *ventilation* ˌventl̩ˈeɪʃn̩ is a typical example.

[92] It is fairly safe to hypothesize that the disappearing i is the agent that palatalizes the preceding s into ʃ.

[93] I rely on Charette (1998) in presenting Haworth's analysis.

(54) 

The symbol **I** represents a piece of melody that is interpreted as i in a 191
vocalic and as j in a consonantal position. The reason why it fails to be interpreted in its original vocalic position is (proper) government. This is a viable description of the situation. The explanation is odd: this transfer allegedly occurs "to avoid an OCP violation, i.e., to avoid the adjacency of two nuclear positions" (Charette 1998 : 170). This cannot be taken to mean the adjacency of the nuclear nodes, since those are always separated by an onset node. If the adjacency refers to the skeletal slots themselves, then the implication is that the onset node lacks a skeletal position, which is created by the melody spreading there, as in (55).

(55) 

In this case, however, the skeletal slots must be marked as to whether 192
they are dominated by a nucleus or an onset node, since normally skeletal slots are not sensitive to adjacency — the skeleton would collapse if they were. This hypothesis is hardly different from equating the nodes and the skeletal positions, i.e., the elements of the skeleton are not uniformly ×s but Os and Ns (cf. Larsen 1995 and section **5.1.2**). If so then an OCP violation may be detected only if the onset node is also lost in the analysis, in which case, however, nothing can spread there. We may safely conclude that Haworth and Charette have no explanation either for these unusual cases of government attacking a nonempty vocalic position.

⋆ ⋆ ⋆

In this chapter, I have introduced an elaborated version of Ségéral & 193
Scheer's Coda Mirror, providing representations for long vowels/diphthongs and coda clusters — two instances of what has been dubbed a burial domain —, defining consonantalness and vocalicness, giving an

alternative definition for government. Two constraints were also proposed: we have seen that the governing power of vocalic positions may be blocked by the so-called Antipenetration Constraint, and that burial domains may not share a skeletal unit, thus excluding three-long vowels, triphthongs and a coda cluster merged with another coda cluster.

5 REPARTITIONING THE SKELETON

The present chapter argues for the necessity of repartitioning the CV skeleton of strict CV theories. The claim made here is that a large set of phenomena fall into place if the skeletal units are not CV but VC sequences. Furthermore, this step reduces the abstractness of phonological representations, making it possible — at least theoretically — that a maximum of one contiguous empty position be posited in skeletons. As it often happens, CV skeletons also have their advantages, the decision between the two must be made after weighing all possible arguments for and against each. **194**

Section **1** is an overview of the development of the notion of the skeleton in current phonological theory. I first compare the CV skeleton of the early 1980s to the X skeleton that gained acceptance in the second half of the decade, then introduce some peculiarities of strict CV skeletons and show why they are not a retreat to an earlier stage of development. The next section (**2**) presents the central claim of VC Phonology, that the skeleton works better if repartitioned. I will show why word-final vocalic and word-initial consonantal positions should be dispensed with and why the observation that CV is the default syllable type is not incompatible with VCs on the skeleton. Then we will see how the extrametricality of word-final consonants falls out of the VC theory without any stipulative clause. The rest of the chapter discusses some felicitous consequences of VC skeletons: a theoretically plausible minimal word constraint (**3**), an excursus on what happens at morphological concatenation sites, with emphasis on elision and liaison (**4**), a new interpretation of the function of licensing (**5**) and finally, a demonstration that government and licensing are indeed local in this theory (**6**). **195**

5.1 The skeleton

This section briefly discusses the development of the phonological skele- 196
ton; how the idea of specifying the basic consonant–vowel distinction on it gave way to extracting even this information only to later apparently return to the original idea. We are also going to see, however, that the strict CV skeletons that evolved in this decade are rather different from those of McCarthy (1981) or Clements & Keyser (1983). A terminological note is also due at this point: the term *CV skeleton* is used to denote the earlier model, where Cs and Vs follow each other rather freely, *strict CV skeleton* means one on which no two Cs and no two Vs may be adjacent.

5.1.1 CV skeletons versus X skeletons

A refined version of Clements & Keyser's (1983) CV skeleton — intro- 197
duced in section **4.3** — is proposed by Kaye & Lowenstamm (1984), one which makes no distinction between points on the skeleton at all. Such a skeleton takes the autosegmental idea to its logical conclusion by stripping skeletal positions of *all* specifications, what remains could perhaps be identified by [+segment].[94] Besides the obvious theoretical elegance that makes this model appealing, it is claimed that there are important empirical arguments too. One is based on facts of compensatory lengthening (Lowenstamm & Kaye 1985–1986): the loss of a coda consonant is often made up for by the lengthening of the preceding vowel, as depicted in (56).

(56) a. CV skeleton

V	C	C
α	β	γ

b. X skeleton[95]

×	×	×
α	β	γ

Following Lowenstamm & Kaye (1985–1986 : 116f), Kenstowicz (1994 : 198
426) claims that in (56a) the problem is having to associate vocalic melody to a C position. This is so only if the skeleton is defined by the feature [consonantal]; in Clements & Keyser's model, however, the

[94] Not even that if we accept unpronounced empty positions.

[95] In (56b) skeletal positions are represented by ×s, as is usual nowadays. Kaye and Lowenstamm use dots, however.

relevant feature is [syllabic] (1983 : 10f). The authors in fact note that it is the default case that V positions host [−consonantal] segments, C positions host either [+consonantal] or [−consonantal, +high] segments. Languages may opt to extend these limits. English, for example is claimed to "allow tautosyllabic VC sequences to dominate single consonant or vowel segments" (*op.cit.* : 32). The idea that each syllable contains exactly one syllabic segment is perfectly compatible with VC long vowels, in fact, unless one modifies the wording to "one continuous sequence of [+syllabic] segments," this is the only possible representation. Therefore, I do not think this is a strong argument against CV skeletons in general. On the other hand, in McCarthy's (1981) model it is the Cs and Vs on the skeleton that control the anchoring of the lexically fully unassociated consonantal root and vocalic grammatical information, thus in this framework linking a vowel to a C position is indeed highly problematic.

199 A further point worth considering is the claim that distinguishing skeletal positions is superfluous if further prosodic structure—involving syllabic constituents, the onset, the nucleus, the coda and the rhyme—is also available. Based on their analysis of Tiberian Hebrew reduplication, Lowenstamm & Kaye (1985–1986 : 124) conclude that the skeleton is not an autonomous entity, it is a derivate of syllabic constituency, the terminal nodes of syllabic constituents.

200 Theories that lay the burden of organizing skeletal positions on syllabic constituents projecting from the skeleton may indeed extract the last bit of information, being consonantal or vocalic, from it. Dismantling syllable structure, however, results in the necessity of restoring the C vs. V distinction on the skeletal level, the gain of this move is the loss of any further hierarchy above it.

5.1.2 Strict CV skeletons

201 It has been argued in section **2.6** that syllabic constituency may be dispensed with: first I have argued against the necessity of hypothesizing codas, then against any branching syllabic constituent. What remains of prosodic structure is depicted in (57), which is an exhaustive inventory.

(57)	a.	b.	c.	d.	e.
	O	N	O	N	
	|	|			
	×	×			×

The crucial questions concerning (57) are (i) whether it is possible to posit skeletal positions without any superstructure, that is, skeletal positions that are underspecified for consonantalness (or syllabicness) on the one hand, (57e), and (ii) whether prosodic constituents can exist without an associated skeletal position on the other, (57c) and (57d). If neither of these configurations are allowed, C and V may be proposed as convenient abbreviations for the onset and the nucleus with the skeletal position linked to each, (57a) and (57b), respectively (cf. Larsen 1995 : 110). 202

It is fairly evident that if (57) is all there is to represent prosodic structure an onset can only be contiguous with a nucleus and a nucleus can only be contiguous with an onset. Any other case would constitute an OCP violation.[96] This being so, bare skeletal positions would be meaningful only in the extreme situation that all positions in a given string are such, that is, if one would wish to give a representation containing only skeletal slots without any superstructure. If at least one position is linked to either an onset or a nucleus, the affiliation of all the other positions in the string is fully predictable, one has to go step by step in both directions from the position given and specify the other positions in a strictly alternating manner. I do not see why such a bare skeleton should be useful, but even if one needed it in his analysis the tacit assumption that onsets and nuclei come in pairs and that all strings begin with either an onset or a nucleus and end in the other again makes the superstructure predictable. 203

As for the other possibility, superstructure without skeletal position, the situation in this case is more subtle. Charette (1988 : 183), following Vergnaud (1982), uses this option to distinguish h-aspiré-initial words from normal vowel-initial words, representing the former by the structure in (57a), the latter by a bare onset node without a dominated skeletal position, (57b). Nevertheless, she mentions (1988 : 187) that there is another way to encode this distinction, in which both types of empty positions are furnished with a skeletal slot, furthermore, in section **5.4**, I offer a VC analysis of h-aspiré, which works without the distinction between the two types of onset positions. For the time being, I proceed assuming that the option of positionless syllabic constituents may also be discarded, if not for else then for its greater generative power: one 204

[96] The OCP is standardly assumed to constrain melodic, not prosodic material, i.e., only subskeletal structure. As argued in section **8.5**, the Cs and Vs of the skeleton *are* part of the melodic content of segments.

rightfully expects convincing analyses arguing for the necessity of a similar distinction in the case of the nucleus too, i.e., phenomena that call for positing different behaviour for (57b) and (57d). In lack of such analyses, two structures of (57a) and (57b) appear to be but notational variants of Cs and Vs, respectively.

It has already been mentioned that researchers who accept that the skeleton is made up of strictly alternating C and V positions also tacitly assume that such skeletons begin with a C and end in a V position. This is so in standard GP too, phonological strings begin with onsets and end in nonbranching rhymes, that is, nuclei. The theory has an ONSET LICENSING PRINCIPLE (e.g., Harris 1997 : 337), which claims that onsets are licensed by the following nucleus. Coupled with the Phonological Licensing Principle (cf. **3.2**), this requires all onsets to be followed by a nucleus. While positing word-final empty nuclei is at least theoretically consistent, there is no theory-internal justification for hypothesizing empty onsets at the other end of the skeleton. The empty onset before a vowel-initial word may be required by empirical evidence, like liaison phenomena, it is not indispensable in terms of licensing relations.[97] This situation suspiciously aims at retaining "full syllables" in phonological strings. Although GP denies the necessity of combining onsets and rhymes into syllables, still we see that words invariably contain complete onset–rhyme pairs, viz., syllables. **205**

One may rightly question the necessity of this assumption. Polgárdi (1998 : 38ff) is one who does so. Her solution is to invoke Optimality Theory to make the Onset Licensing Principle a violable constraint. This way she has some skeletal strings that end in a nucleus and some that end in an onset — in languages which rank this constraint low enough. Her prime motivation for this move is to avoid the necessity of having empty nuclei word-finally for the simple reason of licensing the word-final consonant, which, recall, is in an onset constituent. **206**

On the other hand, if the skeleton is made up of strictly alternating Cs and Vs it is not unreasonable to assume that a C and a V forms an inseparable unit, thus relieving the skeleton building mechanism of its duty to carefully select now one, now the other skeletal type. If Cs and Vs were available separately, the grammar would have to explicitly **207**

[97] In his representation of an #sC cluster, Kaye (1992 : 304f) and Kaye & al. (1990 : 206) carefully avoid including the initial empty onset, others, like Brockhaus (1995 : 218) have it even there.

inhibit two of the same type from occurring adjacently. If, however, CV units come in one, they can simply be put one after the other. In addition, we again have a skeleton with one type of object on it — CV units —, an advantage that seemed to have been lost when X skeletons were replaced by strict CV skeletons. A unification of both requirements, getting rid of word-final empty nuclei and having units of Cs and Vs on the skeleton is achieved by VC Phonology.

5.2 VC skeletons

In Ségéral & Scheer's Coda Mirror theory, there are two locations on the CV skeleton that appear to be superfluous. One of them is the final V position when empty — this has already been hinted at —, the other is the initial C position, which is always empty — though perhaps there is a case when it is not, as we will see below. **208**

5.2.1 Against word-final empty V positions

Let us first consider final empty nuclei. The original insight that is encoded in the representation Cv] for word-final consonants was to distinguish them from word-medial codas. This is necessary for a number of reasons (cf. section **2.3**, ¶56), like the frequent absence of closed syllable shortening in final syllables, the different phonotactic restrictions that bind word-final consonants and word-internal codas (some languages allow greater freedom word-finally than in codas, others exhibit very few — or no — consonants word-finally as compared to codas), the often encountered case of word-final extrametricality, that is, the fact that stress rules do not take such consonants into consideration in their computation (see section **5.2.4**), etc. Kaye's (1990) Coda Licensing Principle makes it impossible to parse a word-final consonant into the coda, given that it would not be licensed. If an onset, however, it must be followed by a nucleus, because of the Onset Licensing Principle. We thus end up with all skeletal strings ending in a V position, full if the word ends in a vowel, empty if in a consonant. The problem facing the analyst at this point is explaining why a word-final empty V position remains uninterpreted. The stipulative second clause of the ECP, (14ii), is clearly not convincing. Furthermore, word-final empty V positions often behave differently from word-medial empty V positions, e.g., their government licensing properties are different: we frequently encounter langauges that **209** allow consonant clusters of some type word-finally but not word-medially before a consonant (that is, before a word-medial empty V position) or the other way around.

GP has theory-internal reasons to hypothesize word-final empty V positions — the Onset Licensing Principle — and to claim that word-final consonants are onsets — the Coda Licensing Principle. In frameworks that formally lack codas, in which the status of all consonants on the skeleton is equal, viz., in strict CV theories coda licensing is meaningless. In addition, Coda Mirror makes onset licensing optional, by allowing C positions to remain unlicensed. Recall, Ségéral & Scheer claim that empty V positions neither license nor govern other skeletal positions. Being totally inert, word-final empty V positions are forced into the representation by one very plausible axiom, that the skeleton is made up of pairs of positions, adding a C position entails adding a V position after it. There is only one way to maintain this axiom and simultaneously dispense with word-final empty V positions: positing VC pairs on the skeleton. **210**

5.2.2 Against word-initial empty C positions

The consequence of this move is the loss of the C part of the word-initial empty CV pair. Note that it is only the empty V position that Coda Mirror makes use of; as far as Ségéral & Scheer's theory of lenition is concerned, word-initial empty Cs have no function at all. **211**

Let us examine Lowenstamm's (in press) arguments for positing an empty CV unit at the beginning of every major category. The first observation Lowenstamm refers to is that languages that tolerate consonant clusters word-initially fall into two types: some have only rising sonority clusters (sC clusters are excluded), others have both rising and falling sonority clusters. His examples are English for the first, Maghribi Arabic for the second type: the former has clusters like *#br, #dr, #gl,* but not **#rb, *#rd, *#lg,* the latter type of language has all six clusters mentioned. Interestingly, there exist no languages with exclusively falling sonority clusters (*#rb, #rd, #lg*). All of these clusters, rising and falling sonority alike, have the representation CvCV (together with the following vowel), that is the two initial consonants are separated by an empty V position, which has to be silenced. Being followed by a live V, the silencing agent appears to be trivial: the following vowel properly governs the empty V position, as shown in (58). **212**

(58)

a.	C	v	C	V		b.	C	v	C	V
	b		r	a			r		b	a

Lowenstamm argues that this is an unsatisfactory explanation, because proper government is not sensitive to the identity of the consonants flanking its target. Therefore, there is no explanation for why English type languages lack falling sonority clusters and for why there do not exist languages with only falling sonority clusters, and more importantly, for why there exist numerous languages in which proper government is operative, yet only single consonants occur word-initially. 213

The solution proposed is that there is an empty CV unit at the beginning of words. Since the empty V position of this unit has to remain uninterpreted, it must be reached by proper government. (59) illustrates three possible word beginnings. 214

(59)

a.	c	v	[C	v	C]	V		b.	c	v	C	v	C	V
			b		r	a					r		b	a

c.	c	v	C	V
			b	a

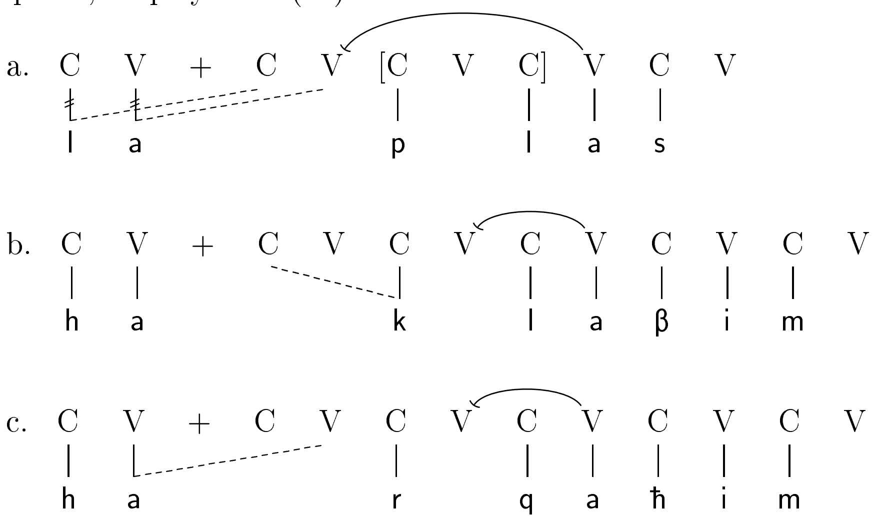
Following Scheer (1996), Lowenstamm claims that in cases like (59a) the cluster creates a closed domain, similar, in some respects, to our burial domains, in which the enclosed empty V position does not seek proper government (for more details, see section **6.2**, ¶253). As a result, the V position of the hypothesized word initial empty pair is reached and the configuration passes as grammatical. If the cluster is such that it cannot constitute a closed domain, as in (59b), the initial V position (encircled) remains ungoverned. This fact renders such clusters highly marked, hence the absence of languages containing exclusively falling sonority clusters word-initially. The grammaticality of these clusters in some languages is due to the fact that these languages do not necessarily require the 215 word-initial site to be licensed, says Lowenstamm.[98] (59c) shows why #CV occurs in all languages: the V position of the initial empty CV unit is always properly governed in this case. Note that this argument stands just as neatly if we suppose that all consonant-initial words carry an empty V position at their beginning. Furthermore, this property is forced on the analyst by having a skeleton made up of inseparable VC units, thus word-initial empty V positions are posited without having resort to stipulating an initial empty CV unit.

The second argument Lowenstamm discusses to support his proposal is that in a number of phonological processes reference has to be made to the beginning of the word. The SPE tradition uses a nonphonological object, the # symbol, to do this. The empty CV position in contrast is a genuine part of the phonological representation, therefore predictions can be made about the phonological properties of the beginning of the word, and these predictions can be tested on data. An example is provided by the previous paragraphs about grammatical word-initial consonant clusters. Lowenstamm provides three further examples — Chaha n > r, Hebrew and Aramaic w > j and German s > ʃ — for processes that occur exclusively in the #_ environment, the last only if a consonant follows. Such data invalidate the VC theory only if analyses are supplemented which make crucial reference to not only the empty V but also the empty C position of the initial empty unit. **216**

Finally, Lowenstamm shows that the way monosyllabic clitics behave in French and Biblical Hebrew nicely parallels the difference the two languages exhibit with respect to word-initial consonant clusters. To do this, he needs to assume a UNIFORMITY CONVENTION (in press, display (27)). The idea is that in languages that allow unlicensed word-initial CV sites, all such sites will count as unlicensed, making cliticiza- **217**

[98] Tobias Scheer (*voce*) proposes that "ill-behaved" languages — basically some Semitic and Slavic languages — simply lack the word-initial empty CV unit. This suggestion will prove incompatible with Lowenstamm's cliticization argument to be discussed below, although it fits with a previous analysis of the same phenomenon, presented in Lowenstamm 1996 : 9f.

tion impossible.[99] Compare French *la+place* 'the place' with Biblical Hebrew ha+klaβim > hakklaβim 'the dogs' and ha+rqaħim > haːrqaħim 'the spices', displayed in (60).

(60)


In (60a) the initial empty CV site of *place* is licensed, therefore the clitic will move in there, vacating its own skeleton, which remains as the empty CV site before *la place.* Biblical Hebrew, on the other hand, is a language that does not necessarily license the initial CV site. As a result, the definite article cannot invade it. The vacuum created in ha∅∅klaβim is got rid of by compensatory lengthening: either the root-initial consonant or the clitic-final vowel spreads out to occupy the appropriate slot. (60b) exemplifies the former case, (60c) the latter. 218

Lowenstamm's analysis of French and Biblical Hebrew cliticization hinges on the shape of the skeleton resulting from the concatenation of the clitic and the root. As we have already seen, it is only the V position of the initial empty site that is licensed or unlicensed, the C position is invisible to this checking. Assuming VC instead of CV skeletons makes no difference in the relevant portion of the skeleton in cliticization. Both 219

[99] This convention is unnecessary if we assume that French has closed domains, Biblical Hebrew does not. Even when the melodic conditions are satisfied — as in a kl cluster — , the fact that in morphologically related forms we find a vowel between the two consonants, cf. keleβ 'dog', can be held responsible for making the creation of a closed domain impossible. Note that the vowel enclosed in the closed domain of languages that lack falling sonority clusters in this environment never surfaces.

French *la* and Biblical Hebrew ha will be associated with a vCVc skeleton (though cf. (72) in section **5.4**), and the roots in both cases will begin vCvC-. It is easy to see that the concatenation of these two strings results in an empty cv sequence between the clitic and the root, just what is needed for the analysis to work.

Thus we may conclude that VC skeletons are capable of producing the same predictions as CV skeletons coupled with Lowenstamm's word-initial empty CV sites, apart from the #=cv cases mentioned above as part of the second argument. However, even these are not conclusive without an explicit analysis of how the relevant processes come about.[100] Furthermore, VC skeletons inherently carry an empty V position before consonant-initial words, there is no need to argue for word-initial empty CV sites. As we have seen, it is the word-initial empty V position that is relevant for the majority (if not totality) of phenomena that word-initial empty CV sites are expected to explain. **220**

5.2.3 The default syllable type

The fundamental insight that the assumption of CV units on the skeleton implicitly encodes is that the default syllable type of natural language is CV. All languages have this type of syllable and some have no other type. This fact in itself, however, is not enough to warrant the conclusion that the units the skeleton is made up of must also be CVs. The other premiss needed to be right in drawing this conclusion is that empty skeletal positions are dispreferred. While the first fact — that CV is the default syllable type — is an empirical one, and appears to be accepted by the majority of phonologists, the second premiss is theoretical and its truth, as I aimed to demonstrate in chapter **1**, is not at all obvious. Strict CV theories that adopt Lowenstamm's (in press) word-initial **221**

[100] One explicit proposal that wishes to use the initial empty C position is made by Ségéral & Scheer (1999b), who argue that the s of initial sC clusters occupies exactly this position. The analysis is not fully convincing, since it couples this phenomenon with the absence of the aspiration of p, t, k after s in English — an aspirated stop is proposed to have the representation cvCV, where the consonant occupies two C positions. This is made impossible if an s occupies the first. However, aspiration is also lacking after f and ʃ (cf. Gimson 1989 : 153), it is a conspiration of facts that this is barely noticeable, since Vf'tV and Vʃ'tV strings are very rare. Barna (1998 : 45) mentions kæf'tæn, a possible pronunciation of *caftan,* lacking aspiration of the t. If Ségéral & Scheer were right, we would expect fC and ʃC clusters word-initially in English.

empty CV sites reject the second premiss right away, thereby losing one possible argument for accepting CV units on the skeleton. By proposing that word edges are signalled by empty skeletal positions, the fact that CVCV. . . CV is the least marked consonant–vowel patterning in natural language will carry no relevance to what the skeleton ought to look like.

The CVs of the skeleton do not have much to do with what the 222
term syllable traditionally means, although a historical relationship is clearly detectable. The Cs are not onsets—nor codas for that matter—, they are *the* consonantal positions available on the skeleton. Therefore whether one posits CVs or VCs to be the units constituting the skeleton has no implications for the markedness of onsets vis-à-vis that of codas.

If word edges are marked on the skeleton, word-initially the signal 223
may as well be a vC unit, that is, a skeletal unit with an empty first half. Similarly, the end of a domain may be marked by a Vc unit, that is, a skeletal unit with an empty second half. We may further assume that languages with the *#V constraint turn the marking preference into a constraint and allow only vC units at the beginning of words. The empty vocalic position will always be silenced since it is being governed by the first pronounced vowel of the word, as can be seen in (61).

$$\begin{array}{llcccl} (61) & \text{v} & \text{C} \Longleftarrow & \text{V} & \text{C} & \ldots \\ & & | & | & | & \\ & & \text{t} & \text{a} & \text{t} & \end{array}$$

The *C# constraint observed in another subset of languages follows from 224
the fact that unlicensed consonants are weaker in supporting melodic material (in the case discussed their weakness is absolute) and ungoverned consonants retain their inherent property, namely, their muteness. This analysis implies the generalization that *C# languages will lack bogus clusters as well, since the first member of a bogus cluster is structurally the same as the word-final consonant, it is unlicensed and ungoverned.[101] Whether there is an implicational relationship between these two constraints awaits empirical corroboration (or refutation). Again one may

[101] If some difference is to be made between the two positions, word final consonants are not followed by any further skeletal positions, the first position in a bogus cluster is followed by a governed empty vocalic position. This, however, is only a formal characterization of the situation, there is no theoretical consequence of this difference.

argue that word endings are obligatorily marked in such languages, by the unit Vc.

Thus, we can say that languages prefer to indicate the edges of the word structurally. Languages having word-initial vowels and/or word-final consonants lack this indicator, hence they are marked. If we add the condition that the optimal case for C positions is to be licensed[102] we derive the default skeleton, vC[VC]$^+$Vc. Surface CVCV unmarkedness thus follows from universal interpretative conventions, not from underlying CVCV skeletons. This conclusion is in line with one of the basic claims of Government Phonology: surface phenomena cannot be taken to be decisive arguments for the underlying state of affairs as regards syllable structure. **225**

5.2.4 Word-final extrametricality

One of the reasons for assuming that word-final consonants do not occupy a coda position (Kaye 1990) is the fact that in many linguistic systems such consonants are invisible to stress rules. By claiming that they are not codas but onsets, the theory predicts that -V.C# will behave as a light, -VC.C# and -$\bar{\text{V}}$.C# as heavy syllables, the desired result for languages like English. **225a**

Strict CV models destroy this distinction. By denying the existence of codas, the definition of what constitutes a heavy syllable also has to be modified, as we have seen in section **2.5.1**. Unfortunately, word-final VCv] will now count as heavy just like word-medial -VCv(C)-, unless we again mask the final C — thus we are back at extrametricality. With the repartitioned skeleton no such stipulation is necessary: word-final consonants are in the same skeletal unit as the preceding vowel, hence they do not add any extra weight to the last syllable. Compare the position of stress in the English verbs in (62) on VC and CV skeletons — above and below, respectively, the melodic material. (The stressed V positions are boxed and aligned.) **225b**

[102] This preference is explained in section **5.5**.

(62) a.			v	C	V	C	$\boxed{\text{V}}$	C	V	C	
				d	ɪ	v	e	l	ə	p	
				C	V	C	$\boxed{\text{V}}$	C	V	C	v
b.			v	C	V	C	$\boxed{\text{V}}$	C	v	C	
				l	ə	m	e	n		t	
				C	V	C	$\boxed{\text{V}}$	C	v	C	v
c.			v	C	V	C	$\boxed{\text{V}}$	c	V	C	
				l	ɪ	n	a		ɪ	t	
				C	V	C	$\boxed{\text{V}}$	c	V	C	v
d.			v	C	V	C	$\boxed{\text{V}}$	c	V	c	
				d	ɪ	n	a		ɪ		
				C	V	C	$\boxed{\text{V}}$	c	V		
e.	v	C	V	C	v	C	$\boxed{\text{V}}$	C	V	c	
		k	ə	n		s	ɪ	d	ə		
		C	V	C	v	C	$\boxed{\text{V}}$	C	V		

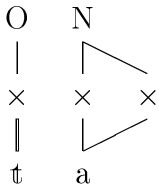
For the first three cases, *devélop,* (62a), *lamént,* (62b), and *leníte,* (62c), the two theories run parallel: the VC skeleton has stress on the penultimate skeletal unit, the CV skeleton has it on the antepenultimate unit. In the last two cases, *dený,* (62d), and *consíder,* (62e), however, they diverge: both the VC skeleton and the CV skeleton have stress on the penultimate unit. Thus in the latter frame the analyst is forced to have two different stress patterns, VC theory, on the other hand, is uniform.[103] **225c**

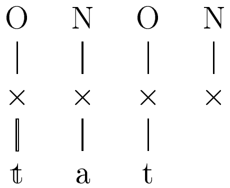
[103] There also exist languages where final consonants are not extrametrical, e.g., Spanish. Without a detailed analysis — a task I do not undertake here — it is difficult to tell whether these present an unsurpassable problem for VC theory.

5.3 The minimal word constraint

It has already been discussed that a number of languages impose a restriction on the minimal size of the phonological form of its major categories (cf. sections **2.4** ¶62 and **2.5.1** ¶74). The constraint bars the surfacing of words consisting solely of one light syllable: *CV, *V are filtered out, but CVV and CVC pass. In a traditional framework the constraint is not very difficult to collar, one has to say that the first syllabic segment must be followed by at least one more, that the rhyme must dominate at least two positions or in a moraic theory, that it has to contain more than one mora. **226**

Standard GP is courting danger by the Coda Licensing Principle, by denying the codahood of word-final consonants. Looking at the representations in (63), one has a hard time generalizing about the two minimal forms. (The portion in "white" is optional.) **227**

(63) a. 

b. 

The disjunction "*either* branching nucleus *or* two onset–nucleus pairs" is unnatural and will not satisfy any theorist who aims at restrictiveness. Another possible formulation would be "at least two positions must be nucleus-dominated." This is perhaps better, but still not very enlightening. **228**

By splitting the branching nucleus as well, strict CV theories appear to make an easy definition possible, something along the following lines, (64). **229**

(64) The Minimal Word Constraint (CV1)

The skeleton of a major category contains at least two CV pairs.

For these theories the problem comes when word-initial empty CV sites 230
are added to the skeleton of major categories.[104] The wording in (65) is not acceptable if theoretical strictness is among our goals.

(65) The Minimal Word Constraint (CV2)

The skeleton of a major category contains at least three CV pairs.

Yet, the representation of the hypothetical (t)aː and (t)at, presented in 231
(66), shows that (65) is what we must say.

(66) a. C V C V C V
        t a

b. C V C V C V
        t a t

At first sight, VC theory seems to face even greater difficulties in 232
expressing this constraint: ta, which is subminimal, is two skeletal units (vC-Vc), at, which passes the size test, is only one (VC). Recall that I have argued above for recognizing two types of word edge marking skeletal units: vC initially and Vc finally. Let us call those units that have an empty slot towards the edge of the skeleton PERIPHERAL units. Any other skeletal unit is NONPERIPHERAL. The constraint thus becomes very simple, as given in (67).

(67) The Minimal Word Constraint (VC)

The skeleton of a major category contains a nonperipheral unit.

The theoretical advantage of the formulation in (67) over those in (64) 233
and (65) is that while the latter two force the grammar to count (up to 2 or 3), the VC formulation simply checks the presence or absence of a given structure. (64) may be made theoretically plausible by gathering pairs of CV units into, say, feet, and declaring a foot to be the smallest possible size of content words (McCarthy & Prince 1986, Harris 1997). Such a strategy is not viable for (65).

[104] It is not obvious if the initial empty CV site does indeed belong to a word, or if it is a mere boundary marker. The latter case saves (64), but invalidates the claim that this empty pair is truly phonological material.

Let us see how the constraint in (67) filters out the subminimal words and lets those that are long enough through. In (68) I give traditional, i.e., surface, CV skeletons and the VC skeletons that are associated with them; the nonperipheral units are underlined, those with a bracket on either side are peripheral, with the bracket towards the edge. (These brackets have no theoretical significance, all they do is mark why a unit is peripheral.) 234

(68)	a. *V	Vc]	b. VC	<u>VC</u>
	*C	[vC	CVC	[vC-<u>VC</u>
	*CV	[vC-Vc]	VV	<u>Vc</u>-Vc]
			CVV	[vC-<u>Vc</u>-Vc]

The attentive reader will have noticed that no mention was yet made of the vc unit, that is, a skeletal unit without associated melodic material. This unit could easily be abused: any subminimal skeleton could be boosted by adding a vc unit to it. In (69a–c) I show the alternative representations of the subminimal forms of (68a) which compete for sneaking into the group of the appropriately sized forms of (68b). (69d) does not include vc, I have included it here because its ungrammaticality is explained by the other forms in this set. 235

(69)	a. *V	[vc-Vc]	<u>Vc</u>-*vc]	
	b. *C	[vC-vc]	[*vc-<u>vC</u>	
	c. *CV	[*vc-<u>vC</u>-Vc]	[vC-<u>Vc</u>-*vc]	[*vC-<u>vc</u>-Vc]
	d. *CC	[*vC-<u>vC</u>		

Note that definition of the peripheral unit includes vc when it is at the beginning or at the end of the skeleton. Thus the first options of (69a) and (69b) are still out. All the other representations, however, include a nonperipheral unit (again underlined). These representations are, nevertheless, all ungrammatical, since the asterisked vs in them[105] are all ungoverned and unburied, hence they may not remain unpronounced. Further addition of vc units will exceptionlessly result in such ungrammatical representations. We can conclude that VC Phonology has a theoretically plausible way of formulating the minimal word constraint, 236

[105] Not all ungoverned/unburied vs are asterisked, since one is enough in each candidate to render it ungrammatical.

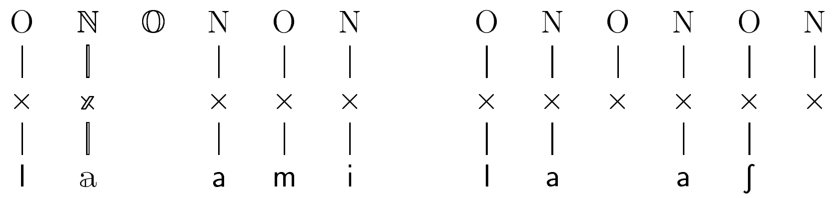
furthermore the theory is adequately restricted not to allow the possibility of eluding the constraint with the introduction of empty material.

5.4 Concatenating skeletons

In their analysis of Polish suffixation Gussmann & Kaye (1993 : 433) intro- **237**
duce the notion of REDUCTION. The device deletes an empty word-final nucleus, together with the empty onset of the next domain to maintain the onset–nucleus alternation, that is, it erases an empty V and the following empty C. This is a severe violation of the principle of monotonicity as Polgárdi (1998 : 37) points out.

Charette (1991 : 90) proposes a similar operation for the elision of **237a**
the vowel in the definite article of French: e.g., *la+amie* → *l'amie* 'the friend-fem.'. To save certain vowel-initial words from this process — those beginning with the so-called h-aspiré: e.g., la+aʃ → laaʃ, *laʃ 'the axe' —, following Vergnaud (1982), she proposes that while *amie* contains an onset without a skeletal position at its beginning, *hache* has one with a position associated to it. The two representations are given in (70).

(70) a. *la+amie* → *l'amie* b. *la hache*

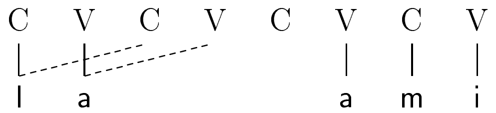


The situation in (70a) is claimed to violate the OCP, and as a result the **237b**
"white" portion is deleted. Two facts, both pointed out by Brockhaus (1995 : 211f), invalidate this analysis. The deletion of prosodic structure is a nonmonotonous operation (it violates the PROJECTION PRINCIPLE, as a GP theorist would say, cf. e.g., Kaye & al. 1990 : 221); furthermore, the interpretation of the OCP assumed here is spurious: on the one hand, here it constrains prosodic structure,[106] not melody (note that the same process applies in *le+ami* → *l'ami* 'the friend', where the melody is not identical), on the other, the OCP is standardly assumed either to block

[106] By assuming, as I have above in footnote 96, that onsets and nuclei are part of the melodic representation, this objection can be neutralized.

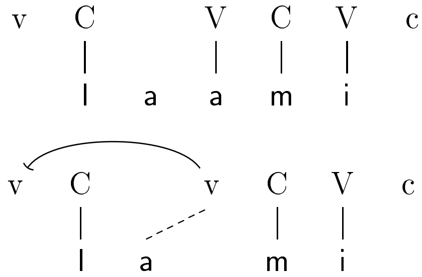
the creation of potential violations (in this case, block the concatenation of *la* and *amie*) or to merge the offending structure (resulting in *laːmi here).

I do not see how Lowenstamm's (in press) framework could be made 237c
capable of handling the case of *l'amie,* as (71) shows (cf. (60)).

(71)


The large number of empty positions accumulating at the beginning of 237d
amie inhibits that the article and the nominal stem get close enough for an interaction.

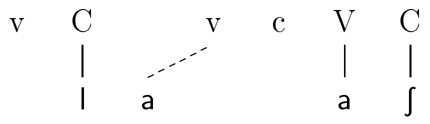
Let us see how a VC skeleton manages to produce the desired out- 237e
put. In this framework, vowel-initial words usually have no empty positions at the beginning, while the skeletons of consonant-initial words begin with an empty vocalic position. (72a) shows the concatenation of *la* and *amie,* (72b) contains a consonant-initial word, *mie* 'crumb'.

(72) a.


b.

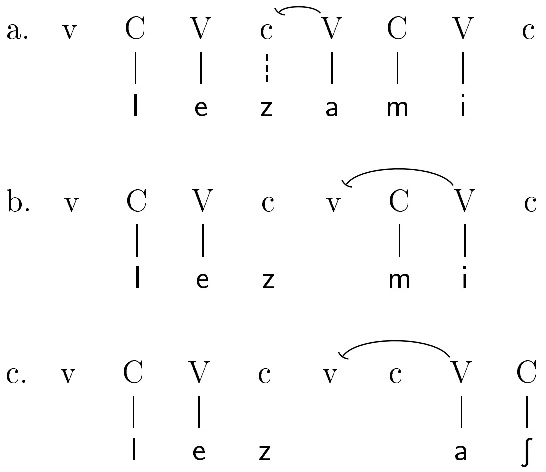
In the representation of *la* the melody is somewhat misaligned: its vowel 237f
has missed the skeleton. The vowel-initial *amie* does not offer an empty v for the floating vowel of the article, which, remaining unassociated to the skeleton fails to be interpreted, we get lami (*l'amie*). It is only consonant-initial words, like *mie,* that can save this vowel, resulting again in lami (*la mie*). One may righfully ask why the a associates to the word-initial vocalic position, which, being governed, has no motivation to be interpreted phonetically. Notice, however, that the representation of *la* is such that it is not interpretable in isolation—as is often the case with a proclitic—, since its initial empty v is not silenced by anything. In fact it is the government coming from the now interpreted stem-initial

V position that assumes the task of silencing it, as shown by the arrow. Words beginning with an h-aspiré are quasi-consonant-initial. This is not a novel observation, similar claims are made by, for example, Hyman (1985) and Piggot & Singh (1985), the latter cited by Charette. What this means for VC Phonology is that the skeleton of words like *hache* begin with an empty v — and consequently an empty c as well. The proposal is presented in (73).

(73)


Since *hache*, but not *amie*, begins with an empty vocalic position, the 237g
former enables, the latter does not the interpretation of the article's vocalic melody. The peculiarity of h-aspiré is that it involves a rather abstract skeletal unit, one which is lexically devoid of any melody.

VC skeletons are also successful in dealing with liaison and its ab- 237h
sence before consonant- and h-aspiré-initial words. I will here exemplify the analysis with the plural form of the preceding items.

(74)


The representation of the plural form of the definite article is somewhat 237i
unorthodox: it contains floating melodic material *and* an unassociated skeletal position. It is the UNIVERSAL ASSOCIATION CONVENTION (proposed by Goldsmith (1976)) that is being defied here. Pulleyblank (1986 : 11f) concludes that the association of floating melody (only tones for

him) and free skeletal positions (only tone bearing units, i.e., interpreted V positions for him) is automatic, but leaves open the possibility that they are not. I have to support the second possibility, claiming that the creation of an association line between lexically unlinked material is subject to external influence and is *not* automatic. A framework, like the present one, that lacks the possibility of creating skeletal positions as the need arises will necessarily have to make this assumption, since a skeletal position that is lexically unavailable for the floating material to associate to can only arrive by morphological concatenation at the edge of the domain (cf. (4)). An even more restrictive framework, which prescribes that skeletons invariably begin in a vocalic and end in a consonantal position, has to assume the lexical nonassociation of word-final consonant liaison, too.

Thus it is only the assumption of melody floating lexically in the presence of an empty skeletal position that solves the problem of languages where the identity of a segment alternating with zero is not predictable. This is exactly the case of French liaison consonants (also cf. footnote 68).[107] The external influence controlling the interpretation of lexically empty positions is, as usual, government: an unassociated C position is linked to floating melody if governed, an unassociated V position is linked to floating melody if ungoverned. Recall that government spoils the inherent properties of its target: the inherent muteness of a C and the inherent loudness of a V position. **237j**

What we see in (74) is that the representations bear out exactly the right facts: where the final C position of the proclitic (or of whatever that ends in the liaison final consonant) is governed it loses its inherent muteness, it is pronounced, capturing any melody it can — *les amies* lezami —, when it is not governed, because the following v positions is **237k**

[107] As for deletable vowels that are unpredictable one can think of the case of Slovakian yers briefly mentioned in section **1.1**, ¶12, or Hungarian, where in the class of "epenthetic" stems we typically find a mid vowel if the position is interpreted (e.g., *majom*∼*maj∅mok* 'monkey', *ökör*∼*ök∅rök* 'ox', *iker*∼*ik∅rek* 'twin' — the nominal examples are all singular–plural pairs in this footnote), the frontness and roundness of which is controlled by vowel harmony. Yet, in a small group of these stems we find other vowels, e.g., *kazal*∼*kaz∅lak* 'stack', *bajusz*∼*baj∅szok* 'moustache', *becsül*∼*becs∅li* 'estimate-3sg.indef./def.', *őriz*∼*őr∅zi* 'take care of-3sg.indef./def.'. These vowels can now be given lexically unassociated, leaving "their" position empty, hence deletable.

itself governed, there is no pressure for it to be interpreted, hence the z remains floating in *les mies* lemi and *les haches* leaʃ.

Returning to Gussmann & Kaye's reduction, mentioned at the beginning of this section, let me observe that their problem stems from the fact that nonanalytic suffixes — suffixes that are joined to bound roots, not words, cf. footnote 149 — are typically vowel initial. Given that GP skeletons invariably begin with an onset position, the skeleton of such suffixes will carry an empty consonantal position at its beginning. Attached to a consonant-final stem, which, recall, ends in an empty vocalic position, we end up with the superfluous empty vc section between stem and suffix. If skeletons uniformly end in a C position and begin in a V position, reduction becomes an unnecessary device. It must be admitted that with VC skeletons morphological concatenations will create empty cv sections (one example is (74c)). Notice, however, that h-aspiré words, which is what (74c) illustrates, are indeed special. Furthermore, consonant-initial suffixes, which may create cv sequences, are usually analytic, hence more independent of their stem. The status of monoconsonantal suffixes, like the English past and plural morphemes, is, nevertheless, unsettled, witness the result of the concatenations representing *copied* in (75a), *harassed* in (75b), *copies* in (75c) and *visits* in (75d). 237l

(75)	a.	v	C	V	C	V	c	v	C
			|	|	|	|			|
			k	ɒ	p	i			d
	b.	v	C	V	C	V	C	v	C
			|	|	|	|	|		|
			h	æ	r	ə	s		t
	c.	v	C	V	C	V	c	v	C
			|	|	|	|			|
			k	ɒ	p	i			z
	d.	v	C	V	C	V	C	v	C
			|	|	|	|	|		|
			v	ɪ	z	ɪ	t		s

The offending bit of all four cases in (75) is the last empty v position, which is neither governed, nor licensed, yet uninterpreted. Examining the 237m properties of analytic suffixation may bring us closer to understanding what is going on here.

Let it be pointed out that a similar suffix of Hungarian, the ac- 237n
cusative marker *-t* is rather well-behaved, at least as regards the predictions of VC Phonology. We find that affixed to consonant-final stems there appears a vowel between the stem and the suffix, by and large, if the stem-final consonant and the t cannot create a burial domain, i.e., a coda cluster (cf. Törkenczy & Siptár 1997 : 25 also in Törkenczy & Siptár 1999 : 277, fn. 60). Consider *boly-t* 'anthill-acc.' in (76a) vs. *rum-ot* 'rum-acc.' in (76b).

(76) a. v C V C v C   b. v C V C v C

          b o j t   r u m t

While jt is a possible coda cluster in Hungarian, cf. *bojt* 'tassel', mt does 237o
not occur monomorphemically. C-to-C government can be created in the first case, the resulting burial domain silences the intervening vowel. Creating a burial domain by a t governing an m, however, is impossible (indicated by a dashed line), consequently the intervening v position must be interpreted phonetically.

Another prediction VC theory makes at morphological concatena- 237p
tion sites — the last to be mentioned in this section — is that there will be a difference between the status of the consonant of a V#CV string, (77a) and that of a VC#V string, (77b).

(77) a. V c + v C⟸V ...

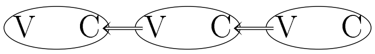
b. V C⟸+⟸V C V ...

As we can see, it is only word-final consonants that assume the position of 237q
a morpheme-internal intervocalic consonant, i.e., governed and licensed by the following vowel. A word-initial consonant will still be preceded by an empty v position saving it from government, unless, of course, preceded by a proclitic, like *la* above, which penetrates the initial position of the skeleton that follows it.

5.5 Lincensing reconsidered

In section **4.5**, ¶159, I have argued that in strict CV theories (this time 238
including VC Phonology) the notion of prosodic licensing becomes superfluous: if every C position is inherently linked with a V position, the mere presence of the V position entails, hence justifies, the presence of a C position.[108]

It seems reasonable to ask then why the notion of licensing is re- 239
tained in the theory. If its function of dooming excess skeletal positions to stray erasure or mere noninterpretation is dispensed with, there is a danger that its consequence, autosegmental licensing, becomes its raison d'être. This is obviously undesirable, one does not want devices in a theory that have only one function; some independent motivation is expected for them. With the repartitioned skeleton, however, licensing assumes new significance. I claim that licensing is the glue that cements the individual skeletal units to form longer skeletal strings. Consider the skeleton in (78). (The ovals link VC units, which are here claimed to be inseparable. To avoid overcrowding displays they are hereafter supplied only when relevant for the discussion.)

(78) 

This interpretation of licensing explains why V positions license Cs and 240
not vice versa: cohesion must be created between units, not within them. It is crucial for such a redefinition of licensing that the skeleton be made up of VC not of CV units.

The consequence of the interpretation of licensing proposed here is 240a
that it will not bind the two parties of a constituent. Note, however, that there do not exist any constituents: the VC units of the skeleton are not constituents, they are inseparable atomic structures. The role of

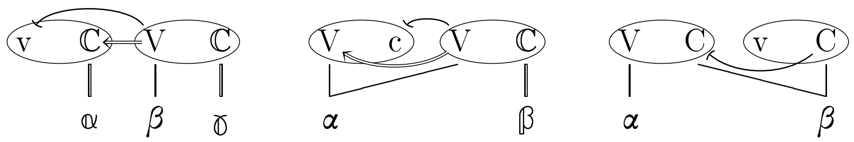
[108] The licensing of V positions has been discussed very briefly so far. Recall, Coda Mirror Plus claims that V positions are inherently licensed, that is, they need no external licensor. There is room in the theory for elaborating a network of more prominent V positions licensing less prominent ones, à la Licensing Inheritance. Note, however, that this conception of licensing will diverge from that of the present framework: it will not be local and unidirectional, and will assign skeletal units to different ranks in a hierarchical structure. Stress and vowel harmony/reduction phenomena certainly call for research in this direction.

licensing is not to save positions from stray erasure, but to possibly link the skeletal units into a longer string, a function which is not obligatory.

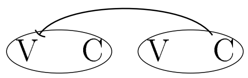
5.6 Locality regained

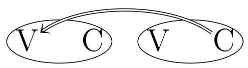
In section **4.6** I have promised to show that both government and licensing are genuinely local in Coda Mirror Plus. We have seen that both forces may "skip" a skeletal unit, as the valid structures of (79) show. (The "white" material is optional; the symbol ℂ represents a variable that ranges over C and c, i.e., a consonantal position that is empty or full.) **241**

(79) a. V-to-V government b. V-to-V licensing c. C-to-C government



The conclusion that can be drawn from (79) is that all possible relations between skeletal positions link two adjacent skeletal units. Neither government nor licensing can reach further than the immediately preceding unit on the skeleton. There is yet another possibility for local government and licensing, depicted in (80a) and (80b), respectively. **242**

(80) a. 

b. 

These options are discussed in section **6.3.2**, ¶264a. **242a**

Hence, in Coda Mirror Plus both government and licensing are local and unidirectional. Besides restricting the theory, both of these properties ensure the efficiency of parsing phonological strings. Without locality the target of government would be indeterminate in a vC-vC-VC string, the governing V could reach either the first or the second empty vocalic position (vC-vC-VC or vC-vC-VC?). Without unidirectionality the same indeterminacy would arise in a vC-VC-vC string (vC-VC-vC or vC-VC-vC?). **243**

6 ONSET CLUSTERS IN ENGLISH

It was noted in section **4.6.2** that based on their behaviour at least three different types of consonant cluster must be distinguished. Coda clusters are distinguished from bogus clusters by the presence of a C-to-C governing relation in the former and the lack thereof in the latter. Thus both types of consonant cluster are CvC on the skeleton, their different behaviour follows from the difference in the silencing of the intervening v position: government in bogus clusters, burial (and optionally government too) in coda clusters. 244

Nothing has yet been proposed as the representation of onset clusters. The reason for this is simple: I do not have a fully satisfactory account of this peculiar type of cluster, therefore in this chapter I survey various proposals, including my own, none of which is acceptable without certain reservations. There are nevertheless a number of observations that may take us closer to the understanding of onset clusters. 245

Section **1** discusses and criticizes Rennison's (1998) proposal that onset clusters are contour segments. The next section (**2**) is devoted to Scheer's (1996, 1998) theory of consonantal interaction, more specifically, infrasegmental licensing. These two sections also introduce some properties that a theory of onset clusters is supposed to predict. Finally, section **3** compares all types of consonant clusters other than coda clusters—the manifestations of C-to-C government—, in order to locate the special properties of onset clusters. 246

6.1 Contour segments?

A somewhat evasive way of representing onset clusters is put forward by 247
Rennison (1998), who claims that they are in fact contour segments just like affricates. Thus the branching part of branching onsets is below the skeleton, the cluster is not a cluster anymore, it is reduced to a single skeletal position. (81) illustrates the idea.

(81) C

p l

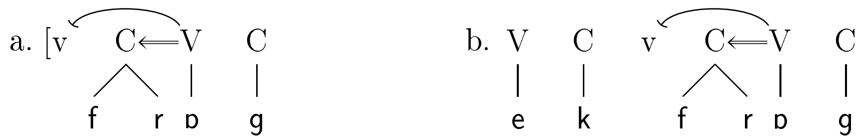
Equating affricates and onset clusters structurally is empirically in- 248
adequate. Affricates occur in positions where onset clusters do not in a given language, e.g., word-finally (e.g., French *table* 'table'), as the first consonant of a bogus cluster (e.g., Polish *srebrny* 'silver-adj.')[109] or even as the first consonant of an onset cluster (e.g., German *zwei* 'two'). Affricates are analysed by Jakobson & al. (1952) as strident stops, an approach that may be implemented in a unary-feature framework (e.g., Szigetvári 1997). The claim is that affricates are distinguished from homorganic stops only by being headed by the noise element making them strident. Besides the representational difficulties with having contour segments at all (cf. section **8.4**), an affricate often does not behave like one: the stop and fricative phase looks temporally unordered in many phonological processes. If affricates are not represented as contour segments, then onset clusters may be, although the difficulties remain.[110] It is, nevertheless, counterintuitive to stuff a large set of acoustic/articulatory events as divergent as onset clusters into the class of monopositional segments. Other segments, including affricates, are much more uniform as regards their melodic make-up: some have multiple places of articulation, some have multiple stricture properties, but none have both.

[109] There are languages that do allow both types of consonant in these environments, like Polish. The point here is that there are other languages, like English, that allow only affricates but not onset clusters here.

[110] Rennison (1998) does not represent contour segments as two-root, two-feature-hierarchy structures, he posits so called lazy elements instead, which participate in the phonetic interpretation later than the others. His proposal is unsatisfactory because it merges onset clusters and affricates.

In this case, however, we expect onset clusters to have a distribution similar to that of single consonants. Their absence in unlicensed positions (word-finally and preconsonantally) may be explained by their complexity: only licensed positions can sustain this much melodic material. The other difficulty with this approach is that onset clusters appear to allow a governed V position before them only word initially but not in a bogus cluster, that is, a word like *frog*, shown in (82a), is attested, others like **ekfrog* (82b) are not, although both seem to occur in the same situation.[111] **249**

(82)



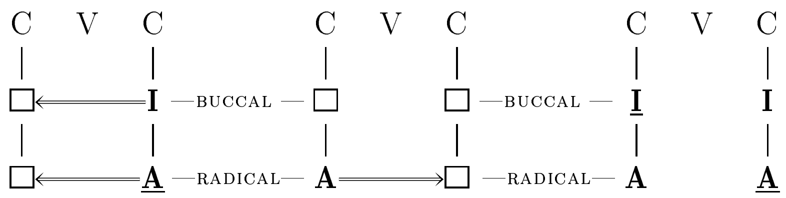
In Standard GP the discrepancy in the grammaticality of (82a) and (82b) follows from the last clause of its definition of proper government — check (15c) again — namely, that it cannot cross a governing domain. Both coda clusters and onset clusters form governing domains for GP, which explains why we do not find a governed V position before an onset cluster in (82b). But then GP does not posit word-initial empty v positions that seek government. We may conclude that likening the #__ and bogus type C__ environments is what causes the problem here. I do not see how any uniform representation of onset clusters could overcome this difficulty; the difference on the skeleton — the first v is not preceded by a C position, the second one is —, together with the given skeletal governing and licensing relationships is not enough to warrant the difference in grammaticality. This empirical difference cripples both this model and the one introduced in the following section. A possible way out is proposed in section **6.3.3**. **250**

[111] Note that *kf* is a possible bogus cluster, witness the monomorphemic *breakfast*. The observation made is that the *kfr* bogus cluster, which is bisegmental here, is not attested. Strictly speaking, the fact that *kf* exists and *kfr* does not is not relevant, *f* and $\widehat{fr}$ are two different segments according to the contour segment view, it is still suspect that no bogus clusters appear to exist with a "contour" second part.

6.2 CvC clusters?

Of the three types of consonant clusters argued for in section **4.6.2** Ségéral 251
& Scheer (1998) distinguishes only onset clusters vs. the others. They follow Scheer (1996, 1998) in modelling onset clusters as domains closed by infrasegmental licensing. I will not provide arguments for the intricate system of melodic representations proposed by Scheer, only hint at the idea. (83) contains the representation of three two-consonant clusters.

(83) a. tr b. θt c. ʃl

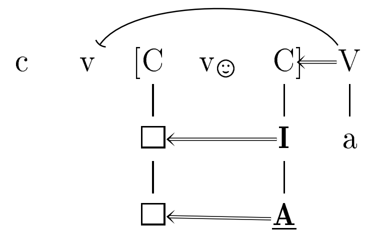


The empty boxes (□) in (83) represent the absence of the buccal ele- 252
ment (**I** or **U**) or the radical element (**A**) on the relevant autosegmental tier. (Following Scheer's convention I use the double arrow for infrasegmental licensing here.) A position licenses another position by infrasegmental licensing if a phonological prime faces an empty position on its tier. In (83c) both tiers are filled for both consonants, therefore no infrasegmental licensing is possible. Consequently, ʃl will never be a closed domain.[112] In a cluster like tr, (83a), two such "bridges" can be built, in θt only one, as shown in (83b). Scheer posits no difference between the number of links provided it is greater than 0. Note, however, that the position of the licensor is different in the two cases. This is of utmost importance: licensors need to be licensed, that is, to be followed by a pronounced vowel. This requirement may be met if the licensor is the second member of the cluster, but not if it is the first, given that there is always an unpronounced V position after it, thus tr may form a closed domain, if followed by a vowel, θt may not no matter what.

To explain why onset clusters may occur word-initially Scheer ex- 253
tends the phonological Empty Category Principle — which I have first mentioned in (14) — by adding the clause that an empty nucleus is silenced by the infrasegmental licensing relationship between the consonants that surround it. This idea is practically another formulation of

[112] The fact that ʃl is possible word-initially awaits a different explanation.

the so-called interonset or onset-to-onset government,[113] (14c), and is also very similar to the C-to-C burial domain introduced in this thesis (section **4.6.2**, ¶174). The claim then is that since the empty v position within the closed domain is "taken care of" by being in the domain it does not absorb the proper government coming from the following V position, thus it can land on the word-initial empty v position. This is shown in (59a), which is repeated here in (84) in an updated format.

(84)


As can be seen, the empty v position sitting in the closed domain is **254**
satisfied. (Scheer symbolizes this with a happy face, v☺. A sad face, v☹, would also be justified, recall, it is against the inherent nature of a vocalic position to remain silent.) Proper government is not needed by this V position, therefore it may silence the word-initial empty one.

I see the following problems with this account. Allowing proper **255**
government to cross a closed domain denies the validity of the clause that proper government may not traverse a governing domain, (15c). It is true that this clause is stipulative in standard GP, in strict CV frameworks, however, it becomes a well-established restriction that can be derived from the principle of locality. The two governing domains that GP has in mind are coda and onset clusters, both of which involve an empty vocalic position on CV skeletons. Proper government may not cross such a domain because the intervening empty v position absorbs it, to confirm this the reader is invited to consult (47) again. So, acceptance of Scheer's view means rejecting the condition on government that it is local.

The second objection concerns the fact that infrasegmental licens- **256**
ing presupposes the licensed status of the licensor. That is, a licensor

[113] Scheer (1998 : 270ff) criticizes Gussmann & Kaye's (1993) interonset government for both violating other principles of the theory and for being inconsistent in the analysis that also applies branching onsets and coda–onset clusters. To this one may add that this third type of C-to-C interaction threatens a theory with overgeneration and leads to indeterminacy at parsing.

must be followed by a pronounced vowel. Now onset clusters occur word-finally, and even preconsonantally, in some languages. This in itself could be explained: this is a marked situation and indeed not very common. However, the theory makes the prediction that if in a language word-final onset clusters are encountered, then in that language rt, lk etc. will satisfy the criteria for closed domainhood. If an infrasegmental licensor need not be licensed—since word-finally it is not—then nothing can stop a structure like (83b) becoming a closed domain. To evade this, one may restrict infrasegmental licensing, making it unidirectional, right-to-left. The idea is not absolutely ad hoc, skeletal government and licensing are uniformly right-to-left after all. Unfortunately, in this case the theory loses the only rationale for the empty vocalic position within the closed domain. This position distinguishes *tr-* from *rt*-type onset clusters, not allowing the latter, in which the r is not licensed. If we are to make infrasegmental licensing unidirectional this function is not necessary anymore. The result is that closed domains become a representation that aims at paying lip service to the idea of strictly alternating Cs and Vs without wanting to adopt the monosegmental view of the previous section.

Finally, as Scheer (1996 : 324) himself admits, this theory is unable **257**
to exclude a number of clusters with fricative second elements, like fʃ, px or tθ. (It is easy to verify this, just switch the two sides of the cluster in (83b).) The model to be introduced presently solves this problem.

6.3 CVC clusters?

The lesson to learn of the preceding section is that if we are to adhere to **258**
the principle of locality and the idea that words carry an empty vocalic position at their beginning—whether there is also an empty consonantal position before it is immaterial here—, there are only two options to choose from. One is pushing all onset clusters into the set of monopositional segments, claiming that they are some kind of contour segments, cf. section **6.1**. The other option is retaining the cluster view, in which case, however, the enclosed vocalic position may not be dead. That is, it may be neither governed nor buried; this will have to be the source of government the word-initial empty v position is craving. The proposal is depicted in (85).

$$\text{(85)}\quad \begin{array}{cccc} \text{v} & C & \Longleftarrow V & C \\ & | & & | \\ & \alpha & & \beta \end{array}$$

Since the intervening V position is alive, it licenses the first C position of the cluster. Its govening power is exerted either on the the preceding v, allowing onset clusters to occur word-initially or, if the preceding vocalic position should be full, the "enclosed" V governs the consonantal position dominating melody α.[114] **259**

6.3.1 Onset clusters, syllabic consonants and syncope

One difficulty with this proposal is that the VC part of the configuration associated with melody β, is most likely the representation of a syllabic consonant. Thus onset clusters and consonant + syllabic consonant sequences are merged in their representation. However, there is, to my knowledge—therefore this may prove to be an easily refutable claim—, no language that would contrast an onset cluster and a consonant followed by a syllabic consonant. There do exist languages that have both configurations available but not in the same environment. What comes very near to the possibility is a case like English *codling* ˈkɒdlɪŋ, the diminutive of the noun *cod* vs. *coddling* ˈkɒdl̩ɪŋ, the gerund of the verb *coddle*—ˈkɒdlɪŋ is also possible here—; or the already mentioned *cycling* saɪkl̩ɪŋ and saɪklɪŋ, which is noncontrastive though. Anyway, all such cases involve a strong morpheme boundary between the syllabic consonant and the following vowel. Word-finally too languages may opt either for having an onset cluster (e.g., French, Polish) or a syllabic consonant (e.g., Czech, English), but never both. This interpretation of onset clusters also brings us closer to an explanation of the fundamental asymmetry between onset and coda clusters:[115] the former must have a second member which **260**

[114] We will have to retreat from this position, at least in the case of English, as section **6.3.3** will show.

[115] This asymmetry is noted but left unexplained by GP, which applies left-to-right (constituent) government for onset clusters and right-to-left (interconstituent) government for coda clusters. The two types of government are claimed to be subject to different melodic constraints to derive the fact that coda and onset clusters are not mirror images of each other, thus attaining descriptive, but not explanatory adequacy.

is interpretable in a V position, viz., a sonorant.[116] This explains the absence of obstruents from the second position of onset clusters. In coda clusters both members are exclusively associated with C positions, therefore individual restrictions on what may occur in either position are less strict, constraints typically refer to the two positions together: a coda can be almost anything, it is usually the place of articulation and/or the laryngeal properties that are constrained, and those with respect to the following onset.

A characteristic that likens onset clusters to CC̩ sequences is the 261
relationship of the two consonants. Onset clusters exceptionlessly have a rising sonority profile. Similarly, in English, for example, we observe that syllabic consonant formation is possible — or, at least, much more likely — after consonants that are less sonorous than the sonorant aiming at becoming syllabic, e.g., *camel* ˈkæml̩ vs. *column* *ˈkɒlm̩.[117] Intriguingly, the same tendency is observable in the case of syncope proper as well, cf. *family* ˈfæmli vs. *filament* *ˈfɪlmənt (cf. Horváth 1999 and Kürti

[116] Though it perhaps weakens the argument, yet it is worth mentioning that the set of potential syllabic consonants and that of potential second members in onset clusters do not always coincide. For example, in English both liquids and nasals may be syllabic (m̩ is rather marginal though), only the former feature in onset clusters. Conversely in Czech and Slovak syllabic nasals are an archaism, practically nonexistent, liquids give the overwhelming majority of consonants in V position, in onset clusters on the other hand both classes are common.

[117] The behaviour of r is rather mysterious. On the one hand, it appears to be among the most sonorous of consonants, in fact, nonprevocalically it is a vowel (ə/ɚ) in English, similarly to the other glides, j∼i and w∼u. It becomes syllabic after any consonant in General American — where it exists nonprevocalically (ɚ means the melody of an r linked to a vocalic position): *femur* ˈfiːmɚ, *banner* ˈbænɚ, *colour* ˈkʌlɚ, *terror* ˈterɚ; also cf. the RP forms *camera* ˈkæmr̩ə, *plenary* ˈpliːnr̩i, *colouring* ˈkʌlr̩ɪŋ, *terrorist* ˈterr̩ɪst. On the other hand, both l and nasals also become syllabic after it: e.g., *barrel* ˈbærl̩, *barren* ˈbærn̩, *quorum* ˈkwɔːrm̩. Also cf. Yiddish vɔrn̩ 'warn 1-sing-pres', hɔrn̩ 'horn' (Lowenstamm 1981 : 584, 587). To exclude the syllabification hɔrn.dl 'horn dimin.', Lowenstamm says "*r,* an **obstruent,** would be lower [in sonority] than its two neighbours ɔ and n ..." (1981 : 594; emphasis mine). Apparently in prevocalic/presyllabic-consonantal — i.e., licensed — position, we have obstruental rs, elsewhere sonorant rs. The problem will be discussed further in section **8.5**.

1999 for recent discussions of syncope in English).[118] It is also trivially true that an onset cluster must have a first member. Less trivially, the first part of CC̩ sequences is obligatory too: there appear to be no cases of word-initial or postvocalic syllabic consonants — except perhaps in very fast speech, which lies outside the scope of the present discussion. With some apologetic explanation the same claim may be extended to bogus clusters. Although word-initially v C V configurations are not simply attested but are in fact the default case, i.e., a governed v position need not necessarily be preceded by a C position, dynamic ə > ∅ / #_ processes are not very common.[119] Furthermore, in English posttonic syncope is unattested in stop+ə+fricative sites (e.g., *Agatha* *ˈægə̸θə, *sycophancy* *ˈsɪkə̸fənsi), which curiously parallels the absence of stop+fricative onset and CC̩ clusters.[120] With the restriction of government to one stress domain — see (51) — , Coda Mirror Plus predicts the nonexistence of pretonic deletion. Note, however, that faster styles defy this ban, e.g.,

[118] Bogus clusters are constrained by the OCP: it is their place features that may not be identical. Here, however, this principle can obviously not be used as an explanatory device, since if it excludes *xy* it will also exclude *yx*. Incidentally, the peculiar behaviour of r cannot be observed here in RP — and probably any other nonrhotic accent — because r does not occur unlicensed, i.e., if not followed by a pronounced V position. Wells (1990) unfortunately does not go into details on this issue; my impression is that General American does have forms like *tyranny* ˈtɪrni, *parody* ˈpærdi. Unfortunately, monomorphemic rəri strings, a possible syncope site producing identical adjacent consonants, all have a full vowel in GenAm, e.g., *honorary* ˈɒnəreri, *literary* ˈlɪtəreri, therefore this possibility cannot be tested. The same is true for w, words with potential post-w syncope sites do not provide any evidence, e.g., *antiquary, equally,* all have an onset cluster which inhibits the process.

[119] This is not to say that they do not ever happen. English, interestingly, conspires against the possibility: as we have seen, vowel deletion is blocked pretonically, but one of the first two vowels of a word must carry stress. If the first is stressed it is undeletable because of that, if it is unstressed the second will be stressed, and syncope will be blocked by the Antipenetration Constraint, barring government from the preceding stress domain, cf. (51). If it still happens, in English pretonic syncope is only possible with a consonant preceding the syncope site, cf. below.

[120] One comment is due here: there do exist bogus clusters of the stop+fricative type in English, e.g., the already noted *breakfast.* What is missing are words with alternating kəf ∼ kf, gəθ ∼ gθ, etc. portions, i.e., only synchronically dead morpheme concatenations, but not dynamic syncope processes yield such clusters.

potato p'teɪtəʊ, *suppose* s'pəʊz. This type of syncope also violates other constraints that hold for posttonic syncope: the second consonant is not necessarily a sonorant and sonority does not necessarily rise in the resulting cluster. It is nevertheless noteworthy that the pronunciation model Wells (1990) is describing does not include such forms.

These observations are comforting and alerting at the same time. 262
On the one hand, they provide further pieces of evidence for a hypothesis that posits the same representation for onset clusters and CC̩ sequences and pave the way towards the claim, to be made below, that word-internal onset clusters are in fact a special type of bogus cluster. The danger they bring about is that in its present state this representation has no communication between the two parties in either case. Thus we have no explanation for why onset clusters exclusively, CC̩ and bogus clusters preferably have a rising sonority profile. The next section attempts to create the necessary relationship between the two consonantal positions.

6.3.2 C-to-C licensing

To create the necessary link between the two positions the following may 263
be proposed. Let us examine the relationships between skeletal positions in (86). Some of them have already been introduced, the others are included to exhaust the logical possibilities. ($\mathbb{C}$ denotes any consonantal position — phonetically interpreted or not — , $\mathbb{V}$ denotes any vocalic position. C and V denote phonetically interpreted positions, which may be melodically empty though. The first two columns of the chart are in what may appear to be an inverted order; this way they represent the order found on the skeleton.)

(86)

	TO	FROM	POWER	INTERPRETATION
a.	$\mathbb{C}$	V	government	some CVs, 2nd part of long vowel
b.	$\mathbb{C}$	V	licensing	full CVs, 2nd part of hiatus
c.	$\mathbb{V}$	V	government	word-initially, etc.
d.	V	V	licensing	long vowel/diphthong
e.	C	C	government	coda cluster
f.	C	C	licensing	onset clusters (?)
g.	$\mathbb{V}$	$\mathbb{C}$	government	—
h.	$\mathbb{V}$	$\mathbb{C}$	licensing	—

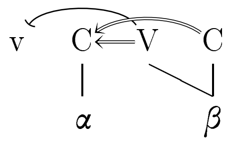
Relationships (86a–c) are universal, they may be found in all languages. These are the skeletal relationships proposed by Ségéral & Scheer (1998, 1999a). The common property of these cases is that the target may either be full or empty.[121] **264**

Relationships (86g–h) are claimed to be impossible. There seems to be no empirical reason to assume a governing or licensing relationship emanating from a C and targeting a V position. The absence of C-to-V licensing also follows from the assumptions of the theory: VC is the skeletal unit within which licensing — the glue cementing the skeletal units — is unnecessary, government is undesirable, in a sense, it would mean the VC unit governs itself. Thus only possibility for a C to govern or license a V is through an intervening empty c and v, i.e., in a Vc-vC skeletal portion. If this configuration is assumed at all, there are still two ways to explain the absence of C-to-V interaction: (i) Vs are in all likelihood the heads of VC units, it would be strange for a dependent to govern or license a head; (ii) the range of government and licensing could be limited: a position can govern and/or license the nearest other position of a certain type before it. This is to say that any position governs and/or licenses either the immediately preceding position or the one before it; if a C is to govern and/or license a vowel, that should be adjacent (but this option is out because that vowel would be within the same unit), if it is to govern and/or license another consonant, that should be the one in the immediately preceding unit — government and licensing are local. **264a**

Relationships (86d–e) are introduced in Coda Mirror Plus for long vowels/diphthongs and coda clusters, respectively. In these cases both positions must be full and, in addition, the intervening position must be empty. **264b**

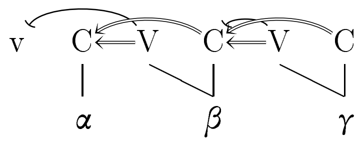
Given the restrictions of the theory, two forces: government and licensing, both local and unidirectional, relationship (86f) is the only available communications channel between the positions involved in the clusters under discussion. So let us play with the idea that onset clusters are managed by C-to-C licensing. The configuration is shown in (87). **265**

121 Full V positions appear to be governable through an empty c position as the case of *medial* ˈmiːdjəl shows (cf. section **4.6.3**, ¶189).

(87) 

Recall, both V-to-V licensing and C-to-C government were claimed to 266
constitute burial domains, which by definition enclose an empty skeletal position. Consequently, C-to-C licensing does not define a burial domain, this is why the double arrow goes around the V position above it. A new feature of the representation in (87) is the doubly licensed status of the first consonant. This fact may invite the objection that C-to-C licensing is unnecessary, the V-to-C licensing that links skeletal positions that are associated with the same melodic material — β and α respectively — ought to function as a melody checking device. Note, however, that the universal relationships (86a–c), of which V-to-C licensing is one, only affect the melodic content of the target. In this specific case, we cannot posit phonotactic restrictions between the C and the V, since this would mean constraining the contents of a syllable onset with respect to the following nucleus, an unattested situation.[122] I claim that it is relationships (86d–f) that produce a melodic compromise between target and trigger. Since this is the situation in onset clusters, V-to-C licensing is not in itself enough, we must have recourse to C-to-C licensing, (87f).

Overlong vowels and consonants were excluded in Coda Mirror Plus 267
by the stipulation that one skeletal unit may not simultaneously be part of two burial domains. If C-to-C licensing does not constitute a burial domain, the question arises why structures like the one in (88) do not occur.

(88) 

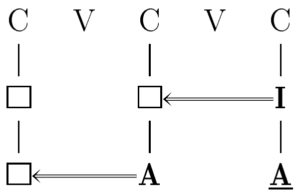
C-to-C licensing was proposed to explain the melodic restrictions not 268
only in onset clusters but also in CC̩ and some syncope-created bogus clusters. The latter, but not the former is subject to the limitation discussed. English does exhibit CC̩C̩ clusters, e.g., *stationary* ˈsteɪʃn̩r̩i; onset+C̩ clusters — three member clusters in which the first two consonants form an onset cluster and the third is a syllabic consonant —, e.g.,

[122] This is discussed under the label PRINCIPLE OF FREE OCCURRENCE in Kaye 1985 : 290 and Kaye & al. 1990 : 200.

apron ˈeɪprn̩, *April* ˈeɪprl̩, *mongrel* ˈmʌŋgrl̩, *children* ˈʧɪldrn̩, *astral* ˈæstrl̩, *cauldron* ˈkɔːldrn̩, *sequel* ˈsiːkwl̩; and even bogus+C̩ clusters, whether the first part is created by syncope — e.g., *rational* ˈræʃnl̩ (← ˈræʃənəl), *corporal* ˈkɔːprl̩ (← ˈkɔːpərəl) —, or not — *Bracknel* ˈbræknl̩.

It may also be argued that it is melodic constraints that exclude **269**
"triply branching" onsets: for the $\alpha\beta$ portion of the cluster in (88) to be acceptable, β must be a sonorant, for the $\beta\gamma$ portion it must be an obstruent. Unfortunately, this explanation necessitates that English sonorant+j clusters are not analysed as onset clusters, although there are strong arguments for this analysis (cf. e.g., Szigetvári 1992, Kaye 1992, Harris 1994: 61f).[123] Let me point out that theoretically Scheer's (1996) model also allows apparently nonexistent overlong onset clusters. In fact, since his theory does not exclude obstruents from the second position, the range of possibilities is much larger than here. A possible case is shown in (89).

(89) tθr

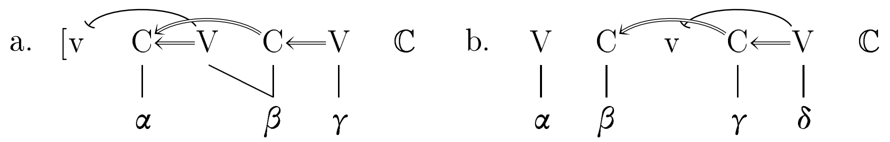


[123] The story is this: conservative RP has the cluster lj in words like *Luke, revolution, illuminate* etc. Yet the cluster is not possible if the l is preceded by a consonant other than s. The claim is that Cl clusters are branching onsets, Clj clusters are impossible because there do not exist triply branching onsets. (The ultimate goal of the analyses is to argue for the claim that sC clusters are not branching onsets, hence slj is possible in conservative RP, e.g., *sleuth* sljuːθ, and sp/t/kj in other dialects, e.g., *spew* spjuː, *stew* stjuː, *skew* skjuː.)

6.3.3 Word-initial and word-medial onset clusters are different

In section **6.1** I have argued that word-medial onset clusters behave differ- 270
ently from word-initial onset clusters (in English) in that the former, but not the latter block government. Thus word-initially an onset cluster allows the preceding empty vocalic position to be governed, word-medially it does not, hence the absence of bogus+onset clusters. If a theory assigns the same representation to a word-initial and a postconsonantal consonant (here I mean only the second member of a bogus cluster) — and this is what both Coda Mirror and Coda Mirror Plus do — then the empirical difference between the two sites cannot be captured.

One obvious solution is to distinguish word-initial and word-medial 271
onset clusters in their representation. The former would have the representation in (90a), the latter that in (90b).

(90)


The middle v of (90b) is governed, hence unable to govern. This explains 272
the absence of bogus+onset clusters, a gap in the lexicon left unexplained by both Rennison's contour onset theory (section **6.1**) and Scheer's infrasegmental licensing theory (section **6.2**).

Distinguishing word-initial onset clusters from others also offers an 273
explanation for the absence of word-final onset clusters in English.[124] If the enclosed vocalic position has to be governed, the cluster is banned from a position where no live V follows. It is for the same reason that we do not encounter an onset cluster before a syncope site, *aproning* may be ˈeɪprn̩ɪŋ but not *ˈeɪprnɪŋ: the enclosed v within a word-medial onset cluster must not remain ungoverned. The strong evidence, the possibility of syncope after word-initial onset clusters, which do not need government, witness (90a), is unfortunately lacking, since this would require pretonic syncope — a phenomenon deemed impossible because of the Antipenetration Constraint. It was also mentioned that the process occurs at some other level, unrecorded by Wells (1990), cf. *potato* pˈteɪtəʊ. The question

[124] In languages that have word-final and/or preconsonantal onset clusters all such clusters will have to enclose a live V, i.e., be of the shape of (87).

is, whether the pronunciations prˈtend[125] for *pretend* or plˈtuːn for *platoon* qualify for the same degree of grammaticality as other instances of word-initial pretonic syncope. If not, the theory would have to claim that the licensor in an onset cluster must itself be licensed.

Why is it then, one may ask, that word-medial onset clusters are not **274**
analysed as bogus clusters? This is because the two types of cluster are distinguished by, for example, lenition. Compare the fate of the onset cluster in *symmetry* ˈsɪmətri and that of the bogus cluster in *cemetery* ˈsemətri. The former one resists lenition (*ˈsɪməʔri), the latter does not: ˈseməʔri[126] (also cf. Harris 1994 : 222ff). This difference will be discussed in section **7.1.2**.

6.3.4 Non-coda CC clusters: a summary

Let me summarize the preceding (and some more) observations in (91). **275**
The chart contains two sections: in the first part, (91a–d), there are constraints, whereas (91e–i) are environments where the relevant cluster may or may not occur. The abbreviations stand for the following constraints: (91a) limits the second consonantal position to sonorants, (91b) posits a rising sonority profile, (91c) requires that the first consonantal position be nonempty, (91d) bans homorganic consonants from the cluster under examination. The symbol '$\mathring{\mathrm{V}}$' is used to denote an unstressed vowel. For the constraints the ticks mean that the cluster abides by the relevant constraint, the stars that it does not (for example, the star for the constraint "*homorganic" in STATIC column means that there do exist homorganic static clusters, the constraint does not bind them, e.g., *movement* -vm-, *encampment* -mpm-). The difference sign (∼) marks ambiguous cases discussed further below. For the environments a tick means that the relevant cluster occurs in the given environment, a star that it does not. Notice that the number of ticks and stars has opposite meaning in the two

[125] This form should only be possible for rhotic accents, in which consonantal r may occur unlicensed.

[126] This is Sarah Newson's intuition. Wells (1990) does not distinguish the two configurations.

sections: in (91a–d) the more stars a column contains the less restricted the cluster, in (91e–i) it is stars that indicate its limitedness.[127]

(91)

		cluster type	ONSET	CC̩	BOGUS		
					DYNAMIC		STATIC
					POSTTON.	PRETON.	
constraints	a.	C_2 is [son]	✓	✓	✓	*	*
	b.	$s_1 < s_2$	✓	✓	✓	*	*
	c.	*∅C	✓	✓	✓	✓	*
	d.	*homorganic	✓	∼	∼	∼	*
environments	e.	#CCV́	✓	✓	—	✓	*
	f.	#CCV̊	✓	*	—	—	*
	g.	CCV́	✓	✓	*	*	✓
	h.	CCV̊	✓	✓	✓	—	✓
	i.	CC#	*	✓	*	—	✓

I have already hinted at the necessity of distinguishing different types 276
of bogus clusters. This distinction is not warranted by representational differences in the theory, (91), nevertheless, clearly shows divergent patterns. The basic dichotomy is produced by the origin of the cluster. Static bogus clusters are such that the enclosed empty vocalic position never surfaces. They are typically created by morphological concatenation, they include a synchronically detectable morpheme boundary between the two consonants. This fact explains the absence of the melodic constraints (91a–d): if they were to respect such constraints the morphology would be severely limited in its work; (91a), for instance, would only allow sonorant-initial second members in compounds. In fact, we can see that the only environment these clusters do not occur in is word-initial position. This follows from there being no single-consonant word level prefixes in English.

[127] The chart in (91) does not include all possible constraints on the relevant clusters. For example, there appears to be a ban on making a nasal syllabic after a nasal+stop cluster: *London* *ˈlʌndn̩, *linden* *ˈlɪndn̩, *tendon* *ˈtendn̩. The data, however, are not unambiguous, cf. *abandon* may be əˈbændn̩, *dampen* ˈdæmpn̩, *lenten* ˈlentn̩. Syncope proper is also double-faced, e.g., *Antony* *ˈæntni, but *maintenance* ˈmeɪntnəns.

277 The two consonants of a dynamic bogus cluster on the other hand are typically monomorphemic.[128,129] Pretonic syncope appears to be an option only word-initially, in #CV̊CV́ sequences. It is constrained by (91c): *adápt* *'dæpt,[130] but the clusters resulting from this process violate the sonority related constraints, (91a–b), *suppóse* s'pəʊz is an example for both; and perhaps the *homorganic constraint, (91d), too, this depends on the grammaticality of forms like *famíliar* ?f'mɪlɪə[131] or *buffoon* ?b'fuːn.[132] Also note that the occurrence of CV̸̊CV́ defies the Antipenetration Constraint of (51) and is predicted to be impossible by theories—like this one—that posit a word-initial empty vocalic position that has to be governed.

278 Although I have just claimed that the different behaviour of the three types of bogus clusters does not follow from representational differences, the emergence of posttonic bogus clusters may shed some light on the melodic constraints in (91a–d). Recall the observation stated in (50d), in section **4.6.3**: posttonic syncope in English presupposes a previous CC̩ stage, although this is not necessarily a possible form in the present state of the language, *simpler* *'sɪmpl̩ə. It follows that dynamic posttonic bogus clusters share the constraints CC̩ clusters are subject to. Bogus clusters that came into existence by some other procedure will obviously be constrained otherwise, if at all.

128 The exceptions are produced by the suffixes *-ing* and *-ly.* The analytic status of the latter is not uncontroversial, cf. footnote 149.

129 It is a question requiring further investigation whether monomorphemic bogus clusters are always dynamic. Harris (1994 : 67) claims and Wells (1990) verifies that *athlete* has the variant æθəliːt. While this form is deemed to be "below" the standard, in another case, that of 'evəri for *every*, the unsyncopated form is found "in very formal style" (*op.cit.* : 256). I am not in a position to judge whether all monomorphemic bogus clusters can be thus split.

130 Lexicalized forms like *'bout* appear to make this claim weaker, but in such words the schwa is historically a prefix.

131 Sarah and Mark Newson claim this form is less acceptable than spəʊz (for *suppose*), but is not totally out.

132 Kürti (1999 : 19) compiles a chart that contains clusters created by pretonic syncope based on various sources. Her data do contain homorganic clusters, like in *perpend* ?p'pend, *baboon* ?b'buːn, the source of which is Siptár (1981), whose forms illustrate very superficial pronunciations including preconsonantal r's, e.g., *repair* ?r'peə, *relax* ?r'læks.

The melodic restrictions on onset clusters, posttonic bogus clusters and CC̩ sequences are not similar to the last detail; the problem case is the *homorganic constraint. Onset clusters seem to abide by a universal ban on the homorganicity of the two parties, there are still cases violating it, e.g., Polish *pływać* pwɯvat͡ɕ 'to swim' and *błoto* bwoto 'mud'. Posttonic syncope behaves ambiguously in English: I have found no cases of two adjacent labials resulting from the process, postalveolars, however, often become adjacent, e.g., *beneficiary* ˌbenɪˈfɪʃri, *natural* ˈnæʧrəl.[133] CC̩ clusters not only tolerate this state of affairs, e.g., *Cobham* ˈkɒbm̩, *Meopham* ˈmepm̩,[134] but may even go for it, e.g., *open* ˈəʊpən > ˈəʊpn̩ > ˈəʊpm̩. Note, however, that this violation of the *homorganic constraint only occurs word finally: *blasphemy* *ˈblæsfm̩i, *dismemberment* *dɪsˈmembm̩ənt, *euphemism* *ˈjuːfm̩ɪzəm, *infamy* *ˈɪnfm̩i, is an exhaustive list of words with medial posttonic C_{lab}əm sequences. It is exactly word-finally that onset or bogus clusters do not, only CC̩ clusters occur. It may also make the observant reader sit up that the progressive place of articulation assimilation of words like *open* is impossible in derivates like *opening* *ˈəʊpm̩ɪŋ. This fact delays hasty conclusions that CC̩ clusters are free to violate the *homorganic constraint. **279**

Onset, CC̩ and posttonic[135] bogus clusters thus show remarkable uniformity with respect to the four constraints of (91a–d). Part of the data that stick out, some of the homorganic clusters could perhaps be swept aside or explained away. The other three constraints hold quite uniformly of all three types of cluster. **280**

As for the environments these three types of consonant clusters occur in, the situation is rather neatly explained by the assumptions made here. The difference between onset clusters and pretonic syncope in (91e) and (91f) follows from the former's different representation word-initially — onset clusters enclose a live vowel, which governs the initial **281**

[133] Since coronals are assumed to lack a place specification, clusters like tn dl etc. are seen as not violating the constraint.

[134] Examples are not easy to come by. This fact may be attributed to the overall scarcity of m̩ in English.

[135] "Nonpretonic" would perhaps be a more adequate name for this group. To be even more precise, I am talking about the position of the emboldened vowel in V́C**V̊**CV̊ strings. Since more than two contiguous unstressed syllables are rare and, more importantly, since I have not examined them, the conventional term "posttonic" can be applied.

empty v, bogus clusters do not. The absence of #CC̩V̊ clusters is a consequence of the Early Stress Requirement:[136] it involves two unstressed word initial expressed V positions.[137] Posttonic syncope resulting in CCV́, (91g), is blocked by the Antipenetration Constraint, the stressed V may not govern into the previous stress domain.[138] Finally, both onset and bogus clusters are impossible word-finally in lack of a governor for the empty v position they enclose.

To conclude, although some advance has perhaps been made, the 282
problem of onset clusters must be left unresolved. I am hereafter going to assume that word-initially they are CVC clusters with a doubly linked sonorant in the VC portion, elsewhere CvC clusters, remarkably similar to a bogus cluster but involving C-to-C licensing. With this, we are now ready to proceed to examining the predictions the theory makes about lenition sites and lenition targets, as well as phonotactic constraints.

[136] The requirement that there be stress on one of the first two syllables in English may be a conspiracy to keep word-initial empty vocalic positions silent. If there were strings with two totally unstressed initial syllables — vCvCvC — , the middle one could be syncopated, hence becoming dead, forcing the initial one to surface: v C v C v C.

[137] The question what saves word-initial nonpretonic onset clusters, like in *preténd,* escape this filter is one I cannot answer at present. This may be a possible point where the theory presented here could be started to be dismantled.

[138] By the same token bogus clusters should also not occur before a stressed vowel, since that vowel will not be able to govern the empty position between the two parts of the bogus cluster, because it is in a different stress domain. Words containing pretonic bogus clusters are indeed surprisingly few in English. The list includes items like *athlétic, magnétic, pragmátic,* etc.

7 LENITION AND PHONOTACTICS

This chapter is meant to be the core of the thesis, exploring the predictions Coda Mirror Plus and the repartitioned skeleton together make about possible sites of consonant lenition, lenition targets and phonotactic constraints. 283

The first section deals with lenition, in governed and in unlicensed positions, followed by a comparison of the three theories discussed, Licensing Inheritance, Coda Mirror and its derivate, Coda Mirror Plus. 284

The second part discusses the predictions on phonotactics, in word-initial, in word-final and in word-medial clusters of two consonants. Next, I turn to three-member consonant clusters, and finally, closed syllable shortening is given another look. 285

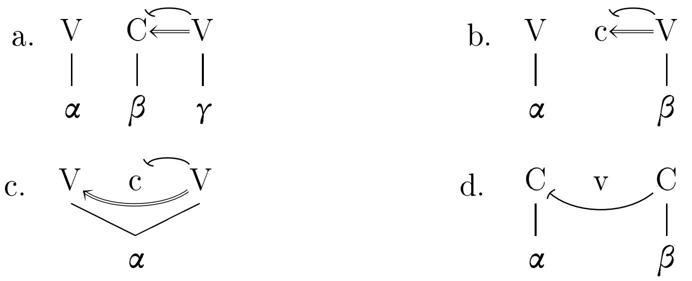
7.1 Lenition

With the new definition of government provided by Coda Mirror Plus, the following predictions are made about the direction of lenition: in governed positions consonants undergo vocalic lenition, sonorization, that is, they lose their inherent consonantalness, their stricture properties; in unlicensed positions they undergo consonantal lenition, that is, they lose melodic elements, they lose their place of articulation. **286**

7.1.1 Governed positions

In Coda Mirror, governed consonantal positions are those that are preceded and followed by nonempty vocalic positions. The preceding one fails to absorb the government coming from the following one, which consequently strikes down on the intervening C position. This is shown in (92a–c). Coda Mirror Plus posits yet another situation: with the introduction of C-to-C government, the first position of a coda cluster is also governed, although followed by an empty vocalic position, (92d). **287**

(92)

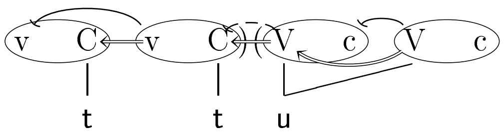


The configurations in (92) exhaust all possibilities for a C position to be governed. (92a) and (92b) depict intervocalic position, where we typically find sonorization:[139] examples for the first case include *better* betɚ > beɾɚ, English *better* > German *besser* (where English manifests the stage German has developed from), Latin *rŏta* > Portuguese *roda* ‘wheel’, L *rīpa* > Port *riba* ‘riverbank’, L *ăcūtus* > Port *agudo* ‘sharp’, L *hŏnos* > *hŏnōris* ‘honor, nom./gen.’ Sonorization in the latter case, (92b), is manifest in hiatus filling, which in this environment typically means the **288**

[139] This was long noticed by phonologists. The usual explanation is that the sonority trough between vowels is levelled, the low sonority of the intervening consonant is raised.

insertion of some glide, part of the melody of one of the adjacent position spreads out and is interpreted in the c position. In English, for example, one of the three approximants j w ɹ/ɻ is eligible to fill this position.

Recall that in section **4.6.3**, ¶181, based on totally independent evi- 289
dence the Antipenetration Constraint in (51) had to be introduced, which does not let government penetrate into other stress domains. Its effect is the lack of pretonic syncope, a very noticeable phenomenon in English. It is the same constraint, now hand in hand with VC theory, that explains the so-called foot-initial absence of lenition. The observation is that in some[140] languages intervocalic consonants fail to lenite if followed by a stressed vowel. English is such a language: *tattoo* tə'tuː does not lenite to *tə'ɾuː or *tə'ʔuː.[141] Consider the configuration illustrated by (93). (Notice that the ungoverned second v of the string surfaces as ə, and, being alive, governs the initial v.)

(93) 

Foot-initial consonants escape lenition because they escape government 290
by being in a different stress domain than the vowel that tries to govern them—the dashed line again represents an unsuccessful attempt at government. In this theory then "foot-initial" absence of lenition is in fact *foot-final* absence of lenition. The fact that stressed vowels fail to govern both the preceding vocalic *and* the preceding consonantal position alike corroborates the hypothesis that the skeletal unit is VC, because not only the preceding V, but also the preceding C remain ungoverned, hence the boundary of the stress domain must fall between the C and the V.[142]

[140] Not, for example, in the Latin > Portuguese change *acútus* > *agúdo*.

[141] Lenition does not happen before tertiary stress, i.e., an unreduced posttonic vowel, either: e.g., *píton* *'piːʔɒn/*'piːɾɑn; *vórtex* *'vɔːʔeks/*'vɚɾeks, but *vórtices* 'vɔːʔəsiːz/'vɚɾəsiːz.

[142] Ségéral & Scheer's (1999b) solution of inserting an empty CV unit before the stressed syllable is less satisfactory, because in a hypothetical an'ta string if a CV is inserted we expect compensatory lengthening to annta or antta on the one hand, the first empty position is not silenced on the other. If no CV is inserted in such cases, then the solution is suspect: it does not blindly apply the device, CV insertion in this case happens only when needed. Such application attributes too much intelligence to the mechanism.

The blocking effect of the stress domain boundary is evidenced by the absence of glide insertion in Malay (Carr & Kassin 1999). Posttonically, we find hiatus filling glides: ˈtari+an > taˈrijan ‘dancing’, ˈburu+an > buˈruwan ‘chasing’. Pretonically, however, hiatus is resolved by a glottal stop: di+ambel > diˈʔambel (*diˈjambel) ‘taken’, ʤuru+aʧara > *ʤuruwaʧara.[143] Since the empty consonantal position creating the hiatus is governed posttonically, it is forced to be filled by a sonorous segment: vocalic material from an adjacent position is ideal for this purpose. Pretonically, the empty position is not governed, it retains its consonantalness, the hiatus filler is ʔ. **291**

Hungarian is another language where lenition is unattested before a stressed vowel, as Gráf (1999) has recently shown. Listing evidence for secondary stress in the language, he observes that this is not possible in the onset of the syllables underlined in (94), which he claims are secondary stressed. (The parentheses show foot boundaries.) **291a**

(94) a. *igyunk már* (iɟuŋk)(maːr)∼(ijuŋ)-∼(iuŋ)- ‘let’s drink’
b. *(azt mondtad, hogy) sört igyunk* (ʃørti)(ɟuŋk)∼*-(juŋk) ‘(you said) we should drink beer’
c. *csend legyen ott* (ʧɛnd)(lɛɟɛ)(notː)∼-(lɛjɛ)-∼-(lɛɛ)- ‘silence there!’
d. *csend legyen* (ʧɛndlɛ)(ɟɛn)∼*(jɛn) ‘silence!’

The lenition ɟ > j (> ∅) only occurs before unstressed vowels, i.e., if the government causing it does not have to penetrate the preceding stress domain. **291b**

One novelty of Coda Mirror Plus is that what was logically impossible in Coda Mirror, the state of being governed *and* unlicensed, is now possible. Since consonants are also capable of governing and it is not only consonants that vowels can license, two configurations are such that their consonantal position is governed and unlicensed. These are the enclosed consonantal position of a diphthong or long vowel, (93c), and the first position of a coda cluster, (93d). In both cases we expect sonorization because of government and loss of melodic material because of the lack of licensing. The result of not being licensed is vacuous in the case of long vowels, since the consonantal position is empty by definition anyway. The fact that it is also very vocalic (because governed) is what **292**

[143] The source does not contain the grammatical form — obviously ʤuruʔaʧara —, the place of stress — probably ʤuruˈʔaʧara —, or a gloss — no guess.

creates the smooth vocalic transition in this type of clusters, as opposed to hiatus, where, recall, the licensing power of the second vocalic position strengthens the intervening empty c to maintain melodic material if it can acquire any from the vocalic positions. In coda clusters, the buried, thus dead, vowel fails to license the first consonant of the cluster, while the second one governs it. We therefore expect either sonorization — the ideal coda is a sonorant — or melodic loss — loss of place contrasts is typical here — or some combination of the two.

7.1.2 Unlicensed positions

Unlicensed consonants are typically not followed by a pronounced vowel. **293**
The one exception is (93c), where the following live vowel depletes all its licensing potential on the preceding V position. The other environments are word-final position and the first position of coda and bogus clusters. Recall, the first position of a word-initial onset cluster is claimed to be followed by a full vowel, hence it is licensed, while in all onset clusters the second consonant licenses the first.

Chart (95) summarizes the four types of positions a consonant may **294**
find itself in. (Abbreviations: bc*n*, cc*n* and oc*n* mean the *n*th position in a bogus, coda and onset cluster, respectively; $\mathring{\mathrm{V}}$ is an unstressed vowel.)

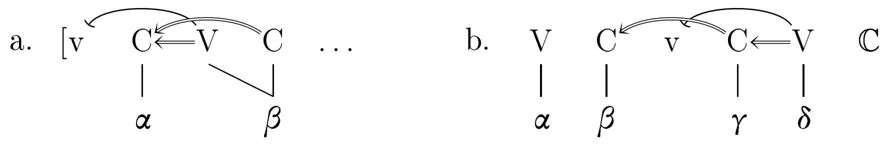
(95)

	LIC'D	GOV'D	LENITION TYPE	POSITION
a.	yes	no	none	#__, oc1, bc2, cc2, __$\acute{\mathrm{V}}$
b.	no	no	c-lenition	__#, bc1
c.	yes	yes	v-lenition	V__$\mathring{\mathrm{V}}$
d.	no	yes	c-/v-lenition	cc1, within a long V

Some comments are due in respect of this chart: the fact that cc1 is **295**
governed just like the empty c position within a long vowel or diphthong shows that the source of government (and also of licensing) is immaterial in gauging its effect. A genuine coda consonant is governed by another consonant, but this government is not different from government coming from a V position.

The status of oc1 consonants seems to be language specific. They **296**
are always licensed by their second member and, word initially also by the live V following them. This property distinguishes an onset cluster, like the tr of *petrol* or *symmetry,* from a bogus cluster, like that of *batt*$\cancel{e}$*ry* or

cemet~~e~~ry. The unlicensed status of the latter, bc1 consonant, results in consonantal lenition, typically glottalization. In English the oc1 position is always ungoverned, since word initially the following live V governs the initial v, (96a), word medially the following v is dead, (96b).

(96) 

The prediction the theory makes is that in systems where onset clusters always enclose a live V, oc1 consonants will be subject to vocalic lenition when preceded by a live — ungoverned — V position. Most of this path remains undiscovered here, but some evidence is provided in the next section. 297

7.1.3 Comparing the three theories

To compare the predictions Coda Mirror Plus makes about lenition sites with those of Licensing Inheritance and Coda Mirror, let us update chart (33), merging it with the data of (95). 298

(97)

		LIC. INHERIT.	CODA MIRROR	CODA MIRROR+
a.	_#	lenition_2	$\text{lenition}_{\text{unlic}}$	c-lenition
b.	bc1	lenition_2	$\text{lenition}_{\text{unlic}}$	c-lenition
c.	cc1	$\text{lenition}_{2/3}$	$\text{lenition}_{\text{unlic}}$	v-/c-lenition
d.	cc2/bc2 V̊	lenition_2	no lenition	no lenition
e.	V_V̊	lenition_2	$\text{lenition}_{\text{gov}}$	v-lenition
f.	V_V́	no lenition	$\text{lenition}_{\text{gov}}$	language specific
g.	V oc1 V̊	lenition_2	$\text{lenition}_{\text{gov/il}}$	language specific
h.	V oc2 V̊	lenition_3	$\text{lenition}_{\text{gov}}$	language specific

For Licensing Inheritance the subscripts represent the number of steps licensing takes to arrive at the given position. Thus "no lenition" should be "licensing_1," since consonants in this theory are immune to lenition if they are the first to be licensed by the head nucleus. Although Harris (1997) does not explicitly assign any relevance to the number 299 of steps down the licensing path — apart, of course, from the basic dichotomy between one and more than one steps — , this could provide a formal means of distinguishing different types of lenition. The types of lenition Licensing Inheritance and Coda Mirror Plus predict show no convergence, therefore the direction of the lenition trajectory the latter theory predicts could hardly be produced by Harris's. Which of the two theories this fact corroborates is an empirical question.

In the Coda Mirror column the subscripted lenition types are formally distinct: lenition$_{\text{unlic}}$ is caused by being unlicensed, lenition$_{\text{gov}}$ by being governed. The unique third type of lenition is exemplified by positions that are governed and infrasegmentally licensed (Ségéral & Scheer 1998); it is not clarified whether infrasegmental and skeletal licensing result in the same effect. Although this theory distinguishes two types of lenition formally, there is no reason given for the different outputs. **300**

The comparison of Coda Mirror and Coda Mirror Plus reveals the following differences: (97c) shows that the former theory does not distinguish bogus and coda clusters. This leaves us without an explanation for the favoured falling sonority profile of the latter. By assuming that consonants in cc1 position are governed, their higher sonority is also predicted. Another difference, (97f), points to the fact that by parametrically restricting government to the stress domain of the trigger by the Antipenetration Constraint, Coda Mirror Plus can save pretonic C positions from its destructive effects. No such restriction is offered by Coda Mirror, apart from the undocumented proposal of pretonic empty cv insertion. **301**

Note that Coda Mirror Plus can account for the language specific lenition or absence thereof in pretonic position. The diachronic Latin-to-Portuguese change, *acútus* > *agúdo*, exemplifies the former case, English *tattóo* *təˈɾuː/*təˈʔuː the latter. For the Romance pattern the Antipenetration Constraint does not hold,[144] thus stress does not distinguish the lenition properties of intervocalic consonantal positions. The grammar of English does contain the constraint. I do not see how Licensing Inheritance could produce this difference. **302**

Language specific differences are also encountered in onset clusters, (97g) and (97h). English fails to exhibit lenition in either onset positions, **303**

[144] Incidentally, French bears witness for the claim: pretonic syncope is common in this Romance language. In *secónd* səˈɡɔ̃/zɡɔ̃ 'second' (< Latin *se*[k]*undus*), we encounter both pretonic syncope and pretonic lenition.

in other systems we find vocalic lenition of oc1 consonants, e.g., Latin *patrem, aprilis*[145] > Spanish/Portuguese *padre, abril* 'father, April'. This hints at the enclosed vocalic position being live in these languages.

To conclude the introduction of the lenition sites predicted by Coda Mirror Plus and VC Phonology, let me point out that in many cases the twin theories claim the same environments to render lenition likely as Licensing Inheritance and Coda Mirror. Where they differ, the two theories offered here appear to make predictions closer to the facts. 304

7.2 Phonotactics

Let us proceed to a more static aspect of the theory, the predictions Coda Mirror Plus and VC Phonology jointly make about the appearance of consonant clusters in phonological strings. Some of the statements of this section have already been made, since phonotactic considerations play an important role in arguing for certain claims of previous sections in the first place. I include them here again to give a comprehensive overview. 305

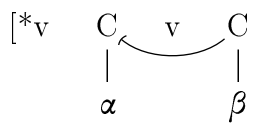
Two provisos must be added before we go on. Firstly, the clusters I model here are all monomorphemic. It is well-known that morphological concatenation can create longer clusters, the analysis of which is outside the scope of this theory. Secondly, as throughout this thesis, I disregard the complications coronal stridents produce. Their wildly weird behaviour is little understood and has not been satisfactorily explained. This thesis does not even try. 306

[145] The status of the clusters in both these words is debatable. Both may be argued to result from syncope, cf. the nominative *pater* and the verbal etymon *ăperīre* 'to uncover'. But then dynamic bogus and onset clusters are intimately related as we have seen.

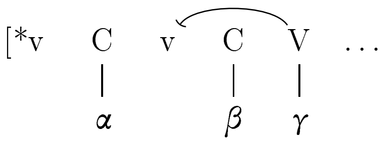
7.2.1 Word-initial clusters

The three types of consonant cluster identified in section **4.6.2** are given 307
in word-initial position in (98). (The brackets again mark the edge of the skeleton, they have purely notational, no theoretical significance.)

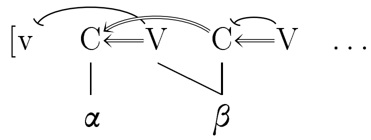
(98) a. coda cluster



b. bogus cluster



c. onset cluster



Both coda and bogus clusters are ungrammatical word initially and 308
for the same reason: the failure of the initial empty v position to be silenced.[146] This position obviously cannot be buried, that would require a consonant on both sides. Neither can it be governed, since its potential governor is dead. In the coda cluster, (98a), it is dead because it is buried, in the bogus cluster, (98b), it is dead because it is governed.

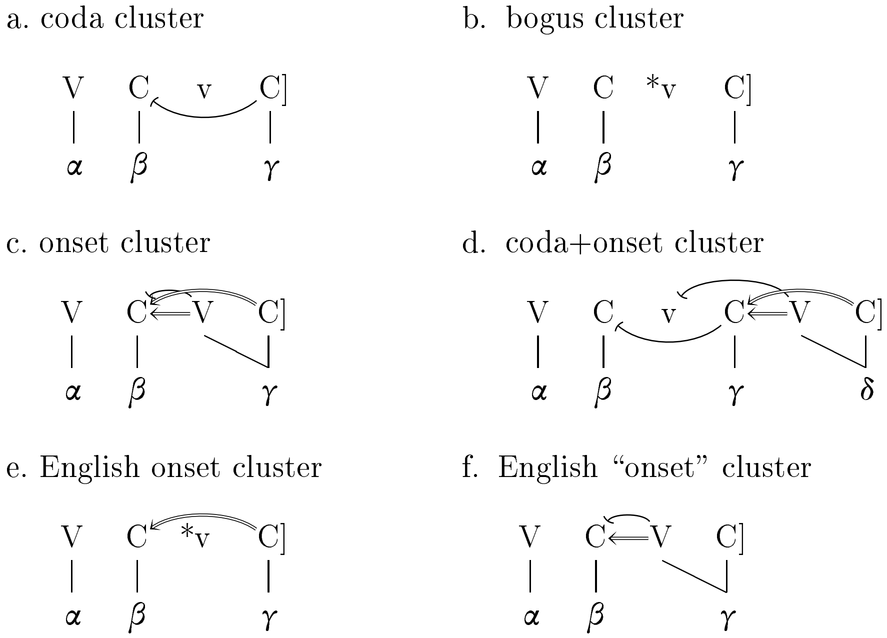
Onset clusters, (98c), on the other hand, are possible in this position 309
because the enclosed live V position governs its word-initial empty pal. In English, it is only word-initial onset clusters that enclose a live V, a hypothesis necessitated by empirical facts, the differing behaviour of these and other onset clusters.

[146] In its present state, the theory developed here is too restrictive to cope with languages that allow any word-initial consonant cluster.

7.2.2 Word-final clusters

In word-final position we have the situations depicted in (99). 310

(99)



Word finally the grammaticality of a coda cluster, (99a), depends on 311
whether in a given system unlicensed consonants can govern. If they can, the cluster will be attested, since the empty v position to take care of, is enclosed in the cluster, it is buried. If they cannot, the same v position cannot be buried, hence it must surface destroying the cluster. In such languages word-final coda clusters will not occur. Actually, the existence of such clusters depends on three parameters. One of them, call it UNLICCGOV for the question "Do unlicensed Cs govern?", has just been mentioned. This parameter presupposes the marked setting of two others: "Do unlicensed Cs exist?", abbreviated as UNLICC, and "Do Cs govern?", which will be CGOV. Let me show this more explicitly in (100). (This time CC means not 'consonant cluster', but more specifically 'coda cluster'.)

(100)

	UnlicC	CGov	UnlicCGov	VCV	C#	VCCV	CC#
a.	no	no	—	✓	*	*	*
b.	no	yes	—	✓	*	✓	*
c.	yes	no	—	✓	✓	*	*
d.	yes	yes	no	✓	✓	✓	*
e.	yes	yes	yes	✓	✓	✓	✓

312 We see that the first two parameters, UnlicC and CGov, are mutually independent, thus they define four different types of languages. The same crossclassification is achieved by Kaye's (1990) theory of coda licensing. He also has two parameters, one of them, which controls the branching of the rhyme is identical to CGov and decides whether the system has (word-internal) codas, (100a) and (100c) vs. (100b) and (100d). The other parameter is different. It licenses or not word-final empty nuclei, which if licensed make word-final consonants grammatical, (100c) and (100d), if not such consonants will not occur, (100a) and (100b). This solution forces the nuisance of having to add an extra clause to the Empty Category Principle, (14ii), which parametrically allows empty nuclei word finally. Such empty nuclei complicate the grammar and the clause itself is very counterintuitive anyway: the licensing of word-final empty nuclei is achieved by a stipulation. Furthermore, very soon researchers working in the GP framework and its derivates began distinguishing word-final and word-medial empty nuclei,[147] a rather dubious practice.

313 Only if both UnlicC and CGov are set to their marked value is the parameter UnlicCGov meaningful. It then distinguishes between languages that do not and others that do have CC# clusters. Wolof and Korean are examples for the former (Charette 1992 : 280), (100d), English and Hungarian for the latter, (100e).

314 (99b) shows a word-final bogus cluster. There is no way this configuration could be made grammatical: the v enclosed between the two consonants is not buried — that would result in a coda cluster — and there is no next V position that could govern it. The reader is referred to (45) to verify that this is the prediction we were aiming at.

[147] Charette (1992), for example, posits different government licensing potential to word-final parametrically licensed and word-medial properly governed empty nuclei. Lowenstamm says "in Norwegian, a word-final [empty] nucleus enjoys the same licensing privileges as a full vowel" (1996 : 17), obviously word-medial empty nuclei do not have these privileges.

With onset clusters the same chart in (45) gives the information that word finally these should be less marked than bogus clusters but more marked than coda clusters. (99c) shows the onset cluster of a language in which there is no difference in the representation of word-initial and other onset clusters. Every skeletal position is grammatical; the cluster is possible word finally. The only possible instantiation of a CCC# cluster predicted by the theory is shown in (99d). This is a coda+onset cluster,[148] which is only available for languages that also allow (99c) as an onset cluster. The representation does not make it clear why the first part of this cluster must be a coda cluster, why it cannot be a bogus cluster. This problem has already been noted in section **6.1**. We are going to see below (**7.2.4**) that English seems to have word-final coda+coda clusters as well. **315**

Some languages — English appears to be among them — have a dead v enclosed in onset clusters that are not word-initial. Hence, the configuration in (99e) will not be possible, non-word-initial onset clusters behave just like bogus clusters in that they do not occur word finally. To make the structure grammatical the empty v position in the cluster must be interpreted: it is either pronounced as the default vowel, e.g., ˈteɪbəl, or the final consonant is interpreted in that position, e.g., ˈteɪbl̩ for *table.* This can be taken to be the English interpretation of a word-final "onset" cluster, as opposed to the, say, French one: tabl. **316**

7.2.3 Word-medial clusters

In (45) we see that any cluster is grammatical between vowels. The reason is obvious: there has to be no relationship between the two consonants, VCCV is always interpretable as a bogus cluster. The enclosed v is governed and does not have to govern. **317**

Several intriguing phenomena related to word-medial clusters were already mentioned in section **6.3.1**. Syncope in English appears to be subject to three constraints. Firstly, the syncope site must be followed by an unstressed vowel: a vowel, which can govern the syncopated position, and unstressed as a consequence of the Antipenetration Constraint **318**

[148] Coda+onset clusters are not to be confused with GP's coda–onset clusters. The former is a three-consonant cluster, whose first two consonants form a coda cluster and whose second two consonats form an onset cluster. The latter is a two-consonant cluster, the equivalent of the present theory's coda cluster.

of (51). Secondly, the syncope site must not be preceded by an empty vocalic position that expects to be silenced by the syncopated vowel or an onset cluster, which in English encloses a v word medially. To translate: syncope is not possible after bogus and onset clusters, e.g., *ádvocate* *ˈædv~~ə~~kət; *ácronym* *ˈækr~~ə~~nɪm, but it is after coda clusters, e.g., *accómpany* əˈkʌmpni, *despérate* ˈdesprət, *adúltery* əˈdʌltri, *sílvery* ˈsɪlvri. Finally, the two consonants around the syncope site must show a rising sonority profile on the one hand and the second one must be a sonorant on the other, as already observed above.

Being post hoc it would not qualify as an explanation, it is still in- **319**
teresting to point out that the constraints on syncope make sure that the parsing of consonant clusters does not become indeterminate. If falling sonority clusters could thus be created the difference between coda and bogus clusters would become blurred. One could raise the objection that the difference between onset and bogus clusters is blurred by the present state of affairs. This, however, is a welcome situation: for many phonological phenomena the two types do behave alike indeed. In section **7.2.5** I will argue that closed syllable shortening is induced only by coda clusters, onset and bogus clusters pattern together.

Another algorithm which is customarily supposed to single out onset **320**
clusters is stress assignment. Words like *álgebra* are often shown up as evidence for the fact that an onset cluster does not render the previous syllable heavy, hence, in the example, the middle syllable is unstressable and the word is stressed on the antepenultimate. A percursory analysis of words matching the $\acute{V}C_0VTRV$ template—where T is a consonant of the set {p t k b d g f θ}, R is one of the set {l r j w}—has revealed that

slightly more than half of the tokens contains a bogus cluster,[149] i.e., for each item like *cérebral* ˈserəbrəl and *hárlequin* ˈhɑːləkwɪn, which are quite uniformly analysed as containing onset clusters, there is at least one other like *labóratory* ləˈbɒrətri/ləˈbɒrətəri and *présbytery* ˈprezbɪtri/ˈprezbɪtəri, the cluster of which is produced by syncope.

7.2.4 CCC clusters

321 Chart (101) summarizes the meagre possibilities for CCC clusters in languages like English: only the ticked cases are attested — again clusters involving s are excluded. Most clusters, shaded grey, are impossible, because of constraints provided by the theory for independent reasons. The white areas deserve a more elaborate discussion.

(101)

		O+O	O+C	O+B	C+O	C+C	C+B	B+O	B+C	B+B
a.	#CCC	∗	∗	∗	∗	∗	∗	∗	∗	∗
b.	VCCCV	∗	∗	∗	✓	✓	✓	∗	∗	∗
c.	CCC#	∗	∗	∗	∗	✓	∗	∗	∗	∗

322 We see that three member clusters are expected to be impossible word initially. Indeed, in this environment three member clusters always involve s in English. Word-medial CCC clusters — again excluding those containing s — uniformly have a coda cluster in their first half: they are coda+onset, e.g., *central, spectrum, culprit* etc., coda+coda (analysing them thus is justified below), e.g., *empty, function, sculpture* etc., or

[149] I have excluded the large class of *-ably/-ibly* words, whose status is debatable. They are often claimed to contain an analytic suffix, *-ly,* that is, a suffix concatenated not to a bound root but to a free form, a word (e.g., Harris 1994 : 25, 51, 70; on the nonanalytic/analytic distinction between suffixes see Kaye 1995 : 302ff). Such suffixes typically do not interfere with the stress pattern of their host, and readily violate phonotactic constraints holding monomorphemically in the system. Now the behaviour of the allegedly analytic *-ly* with respect to these criteria is unexpected: it does influence stress, e.g., *nécessary* may become *nècessárily* (in fact, this is the norm in General American); there is no fake geminate in *finally* *ˈfaɪnəlli (the expected pattern is found only with *some* monosyllabic stems: *coolly, dully, palely, solely, vilely* and *wholly*), and even the schwa is obligatorily syncopated in words like *notably* ˈnəʊtəbli, *ˈnəʊtəbəlli; furthermore, the stem-final *i* of words like *happily* ˈhæpəli/*ˈhæpili (vs. *happiness* ˈhæpinəs) all argue that *-ly* is not as clearly analytic as, for example, *-ness* is.

coda+bogus clusters, e.g., *antler, temp~~e~~rate, angler, vict~~o~~ry, wilf~~u~~lly.*[150] Word finally only what look like coda+coda clusters are attested: e.g., *attempt, sculpt, succinct, mulct.*

Let us see how the current theory accounts for this distribution. 323
The absence of CCC clusters with a bogus first part is the easiest: bogus clusters are only possible if followed by a live V position that governs the v enclosed within the cluster, thus rendering it grammatical. This requirement is not fulfilled when an onset, coda or bogus cluster follows. Recall, non-word-initial onset clusters were claimed to enclose a governed dead v in English, which does not govern. Thus the stars of the B+X columns of (101) are explained. In fact, it is not only the case that the v within a non-word-initial onset cluster does not govern, it also has to be governed. Hence we do not get O+X clusters word medially and word finally. Word-initial coda clusters are excluded by the hypothesis that consonant-initial words begin with an empty v, seeking government, which it fails to get from a coda cluster. Onset clusters and bogus clusters are also impossible word finally, since both need a following V position to license the empty v they enclose. Therefore coda+onset and coda+bogus clusters will not be found word finally. It may be concluded that the shaded areas of (101) can all be accounted for.

Word-initial O+X clusters are not trivially impossible. The repre- 324
sentation of word-initial onset clusters that includes a live V calls for alternative solutions in these cases. An onset+coda cluster may, for example, pass all empty v checking tests, since the vocalic position enclosed within the onset cluster is nonempty, that within the coda cluster is buried. It is melodic constraints, in RP at least, that may be held responsible for excluding this configuration. Of the four segments that are possible in the second position of an onset cluster (oc2), l r j w, none occurs in the first position of a coda cluster (cc1): the last three are either linked to a V or to a licensed C position. As for l, it shows up as ɫ in unlicensed C position and l in the second part of an onset cluster. Thus

[150] The last case is not obviously a coda+bogus cluster. One would like to posit a strong boudary between the stem *will* and the suffix(es) *-fully.* Such an analysis is corroborated by forms like *gratefully* 'greɪtfli, *tastefully* 'teɪstfli etc. In fact, I must admit, these pronunciations argue for a CV skeleton: since Lowenstamm (in press) posits an initial empty CV only for lexical items, not for suffixes, the latter, like *-fully* may begin with a bogus cluster. Within a VC framework even *-fully* will carry an empty v initially, which fails to be silenced if syncope kills the following v as well.

none of them could simultaneously meet the requirements of being in oc2 and cc1 position. An alternative explanation could refer to the requirement that an oc2 consonant be licensed — which it is not in any O+X cluster —, the difficulty again is that this solution works for English, but not necessarily for all other languages possessing onset clusters.

Looking at the ticked clusters, we again run into some difficulty: alleged coda+coda clusters occur both word medially and finally. Such clusters were excluded in section **4.6.1** by the Burial Constraint, in (44), which excludes burial domains sharing a skeletal unit. The constraint does a good job in ruling out three-long vocalic sequences and, as we are going to see in the next section, also in explaining closed syllable shortening, therefore it does not seem wise to reject it. Yet it also excudes any coda+coda cluster. To examine alternatives, such CCC clusters could be treated as coda+bogus clusters, were it not for the facts that (i) all four clusters are possible word finally, e.g., *attempt, sculpt, succinct, mulct,* whereas bogus clusters are not; (ii) syncope is judged possible after them by Wells (1990): *puncturing* ˈpʌŋkʃrɪŋ, *sculpturing* ˈskʌlpʃrɪŋ, *peremptory* pəˈremptri, while it is not after bogus clusters. It may also be attempted to reanalyse them as CC clusters, e.g., mpt could be seen as mt with an excrescent p in between, which is an overlap of the two adjacent consonants, carrying the place of the first and the manner of the second. While such a move might be imaginable for the nasal-initial clusters, it is quite unlikely to succeed with the l-initial sequences. As a last resort, we seem to have to suspend the Burial Constraint in these cases. What is to be ascribed as an advantage to this theory is that here it is only a(n apparently violable) constraint that inhibits most coda+coda clusters from appearing, in other theories, like standard GP, this fact is usually encoded in the skeleton and is often impossible to suspend. 325

7.2.5 Closed syllable shortening again

In section **2.5.2** I have discussed Lowenstamm's (1996) proposal to explain closed syllable shortening. At that point it was introduced to show that the phenomenon could be dealt with on a strict CV skeleton, since I was arguing for its superiority. In fact, there appear to be a number of flaws in the analysis. All that theories furnished with codas have to stipulate or derive from basic principles is the impossibility of having a coda next to a branching nucleus within the same rhyme. If codas are all claimed to be like onsets with an empty nucleus after them, this explanation is 326 destroyed. What must be called for help are the relationships between skeletal positions.

For the forgetful let me briefly sketch the claim again. On a CV 327
skeleton consonant clusters necessarily involve an empty v position — though the suggestion made above for modelling onset clusters lessens the validity of this statement. Lowenstamm represents long vowels as a full V position followed by an empty cv pair. The melody of the full V spreads on the empty v. Thus the relevant skeletal string is $\mathrm{Vcv_1Cv_2C}$. The V's melody can only spread if the target is licensed. What blocks the spreading then is the fact that $\mathrm{v_2}$ is unable to properly govern, hence license $\mathrm{v_1}$, the position where V is trying to spread its melody. (102) is copy of (18), provided to save the reader the trouble of having to turn back to the relevant page.

(102) a. katpi, *ka:tpi

C	V	c	$\mathrm{v_1}$	C	$\mathrm{v_2}$	C	V
k	a			t		p	i

b. ka:tupi

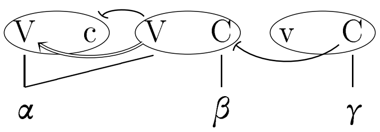
C	V	c	$\mathrm{v_1}$	C	$\mathrm{V_2}$	C	V
k	a			t	u	p	i

Now for the problems. Firstly, being licensed basically means in 328
this account that the position may do whatever the data make necessary. Some vs are licensed, therefore remain uninterpreted — think of the common properly governed empty v —, others are licensed, therefore get interpreted, like here. Secondly, in a number of languages (English being one of them) long vowels pattern with (heavy) diphthongs. In some diphthongs the melody associated with the second position is not a proper subset of that of the first, i.e., the second position is independently associated with melodic material: it is not empty. Yet these diphthongs are just as impossible in a closed syllable as others.

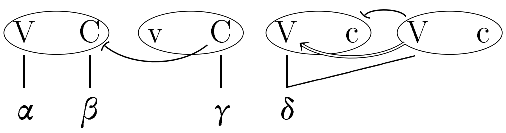
Lastly, closed syllable shortening does not take place before just 329
any consonant cluster. Its absence before onset clusters in captured by Lowenstamm: taking them to be closed domains allows the governing power of the following full V to propagate through the cluster licensing the target of spreading, much like in the case of word-initial empty v

positions. However, this account wrongly predicts closed syllable shortening before syncope sites too, that is, before bogus clusters[151] (also cf. Harris 1994 : 223). Furthermore, this account forces a distinction between word-final empty nuclei, which appear to be able to license the v for the vowel to spread and word-medial empty nuclei, which are not able to do so. In the present framework, which is more restrictive in this respect, such a distinction is not even possible.

Coda Mirror Plus and VC Phonology offer a different solution. Recall that the absence of contrastive three-long segments was explained in sections **4.6.1** and **4.6.2** by the constraint that burial domains may not share a skeletal unit, (44). Let us examine the long vowel–coda cluster sequence depicted in (103). 330

(103) 

We see that an adjacent V-to-V and C-to-C burial domain will share the middle skeletal unit, in violation of the independently posited constraint in (44), since the skeleton contains VC units. This explains closed syllable shortening. The same burial domains in opposite order are perfectly grammatical, witness (104). 331

(104) 

That is, a coda cluster may be followed by a long vowel or a diphthong without any restriction (e.g., *intern* -ntɜː-, *vampire* -mpaɪ-). This effect cannot be imitated in frameworks that have CV units. 332

The analysis offered here is unable to account for closed syllable shortening word finally and before bogus clusters. This is descriptively 333

[151] Here is a list of English words, excluding *-ing* and *-er* forms, in which Wells (1990) marks possible syncope, but we do not get closed syllable shortening: *ācreage, bāke̸ry, bārba̸rous, Bārba̸ry, bicārbo̸nate, brāve̸ry, cōrpo̸ra, cōrpo̸ral, cōrpo̸rate, deōdo̸rant, embrōide̸ry, exūbe̸rant/ce, fāvo̸u̸rite, fēve̸rish, fūrthe̸rance, intērca̸lary, īvo̸ry, lāuda̸num, lēve̸rage, lūte̸nist, Lūthe̸ran, mārve̸llous, mūrde̸rous, pārdo̸ner, protūbe̸rant/ce, puērpe̸ral, recūpe̸rative, revērbe̸rant, sāvo̸u̸ry, slāve̸ry, trāito̸rous, ūte̸rus, vitūpe̸rative.*

felicitous in the case of English and Hungarian, since these languages exhibit the phenomenon only before coda clusters. It is evident that some other explanation must also be available for languages like Turkish or Yawelmani that have closed syllable shortening in those environments as well.

As noted in the previous section, a theory that encodes a certain 334
phenomenon, like closed syllable shortening, in some static part of the framework has a hard time analysing cases where the encoded regularity does not hold. This is the case with closed syllable shortening. If it is explained by claiming that it is impossible to have a branching nucleus within a branching rhyme (as Kaye (1990 : 306) and Kaye & al. (1990 : 199) do) then the theory is totally helpless with cases like English *chīld, pāste, hōld, ask* ˈɑːsk, *after* ˈɑːftə, *excerpt* ekˈsɜːpt, *absorbtion* əbˈsɔːpʃən etc. To cope with such data Harris (1994 : 76ff) is forced to accept three-position rhymes. The repercussions of the move are quite radical: the last — coda — position of the resulting rhyme is not governed by its head, hence it is not licensed by it, in fact, it is licensed solely by the following onset. One begins to wonder why such a coda is in the same constituent as the preceding nucleus, why not as the following onset. On the other hand, if phenomena which are not exceptionless are made the result of some more or less stipulative constraint, it is easier to get away with the offending cases. It is important to emphasize that I do not intend to say that the present theory succeeds in *explaining* why there do occur coda+coda clusters (as in *empty*) or long vowels followed by a coda cluster (as in *chīld*), only that it can *account for* these data somewhat more easily.

8 MELODIC CONSIDERATIONS

After having extensively discussed the nature and organization of the phonological skeleton, we now come to examine subskeletal structures. It is not among my primary goals in this thesis to propose a model for the representation of the melodic aspect of sound structure, this chapter contents itself with discussing some general considerations concerning the representation of melody and collecting some consequences that appear to follow from Coda Mirror Plus. The danger of doing so is obvious: it is easy to criticize other people's view without running the risk of eventually having to propose alternative and superior solutions. This chapter is a kind of appendix that only attempts the first steps in this direction. **335**

Section **1** contemplates on the nature of melodic primes, some general considerations of what they should and what they should not encode. Then I turn to a comparison of binary and unary features as regards their generative capacities, and conclude that the number of primes a theory of melodic representations should incorporate is around half a dozen, definitely fewer than what most such theories posit (section **2**). After arguing in section **3** for the necessity of treating skeletal units on a par with other melodic primes, retaining the obvious differences, of course, and showing why a framework applying the notion of feature geometry is not a very restrictive one (section **4**), the glides of English are examined (section **5**). I argue that the difference between identical melodic material associated with a V or a C position is so great that it ranks the two types of segment to very different levels of the sonority hierarchy. Next I try to locate the range of phenomena that are subject to OCP effects (section **6**), and finally attempt the proposal that the stricture properties of consonants are a consequence of skeletal configurations, not of melodic material associated with a specific skeletal position (section **7**). **336**

8.1 What is a melodic prime?

It is a truth generally accepted by phonologists that sounds are not 337
atomic. As building blocks some frameworks use their acoustic properties (e.g., Jakobson & al. 1952), others their articulatory properties (e.g., Chomsky & Halle 1968).[152]

Debates begin at the next stage where it has to be decided what 338
properties of the speech signal are to be encoded in the representation. Here again there is consensus about certain basic guidelines like that the loudness of the voice of the speaker may safely be ignored since it never carries any lexical information. Opinions vary on the other hand on many other points, for example, on whether sonorants have to carry an explicit reference to their being voiced.[153] In many linguistic systems this property is also devoid of any relevance, yet there are researchers who posit the presence of the voicing prime in sonorants. Because sonorant voice is so different from obstruent voice, not only phonetically but also phonologically, one provision is usually added in underspecification theories: underlyingly sonorants lack a specification for the feature voiced, which they only acquire at a very late stage in the derivation. This provision is not particularly useful. If the feature is visible to phonological processes after all then the voicing contrast *is* significant for sonorants and one reasonably expects an account for why sonorants almost always surface voiced.[154] If the feature value is filled in as the last step then its only use would be to inform the phonetic interpreter of an obvious fact; phonetically sonorants have so-called spontaneous voicing (cf. Chomsky & Halle 1968 : 300f, Hayes 1984 : 323ff).

The reason why many theories insist on including a [+voiced] or 339
[voiced] feature in sonorants is preoccupation of these theories with full

[152] See Harris & Lindsey 1995 : 49ff for reasons not to prefer the latter stance over the former.

[153] Recall that I have begun discussing the same example in section **1.2**. Answers to some questions were also promised there, in footnote 6; they are given soon.

[154] The default rule [α sonorant] → [α voiced] is not an explanation, it is a description of the state of affairs.

specification.[155] This idea stems from the tradition that sees segments as collections of all possible features together with values. Underspecification theories stripped only the values off these features, not the features themselves. If an underspecification theory works with unary features, it will inevitably come to the conclusion that sonorants do not have the feature [voiced] underlyingly. Or superficially; the meaning of [voiced] is not that the vocal folds vibrate, but that they are made to vibrate. For sonorants the vocal folds do not need to be set vibrating, they do it spontaneously, thanks to the relatively free flow of air through the vocal tract. In fact, it takes an effort to inhibit their vibration. One way of doing this is spreading them so that the gap between is too wide for the air flow to set them in motion. Although the effect is voicelessness, the mechanism used to produce it is elsewhere characterized by the feature [aspirated]. Indeed, "voiceless" sonorants behave like aspirated in languages that possess them, claims Lombardi (1995b : 51). It may be concluded that normal sonorants lack the [voiced] feature.[156]

According to the view presented in this section, melodic primes 340
should be posited only for those properties of sounds that involve some special activity. Spontaneous voicing, for example, is not such a property, therefore it should not be encoded in the representation. This goal cannot be achieved if phonological features are binary, since such features are omnipresent in the representation. If a binary feature is allowed to be unspecified all through the derivation, thus it is not obligatory in the representation, it automatically becomes a ternary feature — with the values '+', '−' and '$\emptyset$'. If, however, a binary feature must be specified either '+' or '−', in the case of sonorants [+voiced] is the obvious choice, rendering voiced obstruents and sonorants a natural class. Steriade argues that this is required since in some languages they do pattern together (1995 : 168). With respect to her claim that English plural/present-3sing/genitive and past allomorphy involves the spreading of [+voiced] from sonorants, as well as from voiced obstruents, it must be noted that this is not the

[155] For example, Lombardi, who argues that [voiced] is a privative feature, assumes that eventually all phonetically voiced segments are furnished with it (1995a : 67). Furthermore, she claims that the negative values of privative features are also capable of spreading — a weird idea.

[156] It is a different, no less intriguing question what is the result if the [voiced] feature is associated with a sonorant.

only possible analysis. Based on the assumption that obstruents in English are not distinguished by [voiced] (or, if you like, [slack vocal folds]) but by [aspirated] (i.e., [spread glottis]) (cf. Harris 1994 : 133ff, Iverson & Salmons 1995), there is no process when the plural/present-3sing/ genitive allomorph z and the past allomorph d surface — these are the underlying forms —, and it is the spreading of [aspirated] that results in s and t in these forms. Whether Steriade's other examples can also be reanalysed so easily is a question I do not pursue here.

8.2 Overgeneration

In section **1.2** I have argued that of the various types of melodic primes 341
proposed to date unary features are the most restrictive. Without any extra device a given number of binary and unary features produce the same number of contrasts, although the restrictiveness of the latter is obvious: no reference can be made to the absence of F, as opposed to the situation with the binary equivalent −F, furthermore, by using binary features the analyst is forced to record properties of segments that do not have to be encoded. Let us compare the contrastive potential of two binary and two unary features, in (105).

(105)

	BINARY	UNARY
a.	−F, −G	∅
b.	−F, +G	G
c.	+F, −G	F
d.	+F, +G	F, G

Pulleyblank warns us that "supplementing these possibilities with 342
formal notions such as headedness or dependency derives additional contrasts" (1995 : 18). Indeed, while it is true for both binary and unary features that n features distinguish 2^n different cases, positing that, say, a maximum of one feature may function as head raises the contrastive potential dramatically. For n binary features the number of distinct specifications is $(n+1)2^n$, while for n unary features it is $(\frac{n}{2}+1)2^n$, that is, for the two features above the numbers will rise from 4 to 12 in the case of binary and from 4 to 8 in the case of unary features. This is shown in (106).

(106)

	BINARY	UNARY		BINARY	UNARY
a.	$-$F, $-$G	$\emptyset$	c.	+F, $-$G	F
a′.	$\underline{-\mathrm{F}}$, $-$G	—	c′.	$\underline{\pm\mathrm{F}}$, $-$G	$\underline{\mathrm{F}}$
a″.	$-$F, $\underline{-\mathrm{G}}$	—	c″.	+F, $\underline{-\mathrm{G}}$	—
b.	$-$F, +G	G	d.	+F, +G	F, G
b′.	$\underline{-\mathrm{F}}$, +G	—	d′.	$\underline{\pm\mathrm{F}}$, +G	$\underline{\mathrm{F}}$, G
b″.	$-$F, $\underline{\pm\mathrm{G}}$	$\underline{\mathrm{G}}$	d″.	+F, $\underline{\pm\mathrm{G}}$	F, $\underline{\mathrm{G}}$

343 The discrepancy making the unary feature system more restrictive is caused by the fact that in a binary framework "$-$F" is an object—that may be a head—, in a unary framework the corresponding "absence of F" is not the type of thing that could be promoted to head position. This fact is shown most clearly in (106a): headedness makes no sense in a totally unspecified segment, if, however, one uses negatively specified features to achieve the same result, headedness will produce three different cases.

344 The figures in chart (107) are provided for a quick reference for those planning to devise a feature system. It contains, and compares, binary vs. unary systems, with and without a head, the cells contain the number of potentially contrasting cases determined by the given conditions.

(107)

		NUMBER OF FEATURES						
		1	2	3	4	5	6	7
PLAIN	BINARY	2	4	8	16	32	64	128
	UNARY	2	4	8	16	32	64	128
MAX. 1 HEAD	BINARY	4	12	32	80	192	448	1024
	UNARY	3	8	20	48	112	256	576

345 Estimating the number of potentially contrastive speech sounds around 100, we can conclude that if no dependency relationships are invoked about seven different melodic primes should suffice, and from this point of view it is immaterial whether they are binary or unary. If one is to make use of assigning head status to at most one feature then five unary features must be enough, five binary ones seem too many. Though the figures of (107) may be reduced by feature cooccurrence restrictions, these are inelegant and make one suspect that the features were not well-chosen.

8.3 How are segmental properties encoded?

Linear models of phonological representation stuff all properties of the 346
speech signal into successive feature bundles, which represent segments. Since feature matrices are the only available possibility, properties that are evidently prosodic, i.e., not inherent in individual segments, are also assigned to one of the bundles. Such properties include length, stress, tones and syllabicity, the first to be plucked off in autosegmental models. While length can be read off the skeleton, the location of syllabicity, for example, is transferred to above it: whether a segment is syllabic or not depends on the syllabic constituent that dominates it. The interesting effect of this development is that the primes that can still be found on the melodic tiers are no longer sufficient to determine all the phonological (or phonetic) properties of a given segment. To put it in more positive terms, some load is taken off the feature system and handled by the newly introduced other parts of the representation, e.g., the contrast between j and i—cf. Hungarian *máglya* maːgjɒ 'bonfire' vs. *mágia* maːgiɒ 'magic'[157]—is not encoded by a feature [syllabic] or [vocalic] but by the association to a nonnuclear skeletal slot, viz., a C, or a nuclear skeletal slot, viz., a V. This means that the expressions in (108a) and (108b) are just as different from each other as those in (108b) and (108c).

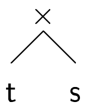
(108)	a. V	b. C	c. C
	|	|	|
	α	α	β

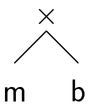
The prime function of the Cs and Vs of the skeletal tier is organizing 347
the temporal sequencing of the sound flow, but it is also charged with another duty: it also acts as a melodic tier. It would be wasting the representational resources not to utilize this function too. In section **8.5** I provide empirical evidence for the distinctness of (108a) and (108b). In the meanwhile, I am going to explore a model which posits more structure in segmental representation than those introduced so far.

[157] Examples by courtesy of Péter Siptár.

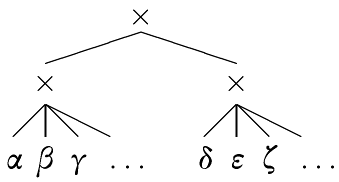
8.4 Feature geometry

In section **1.1**, ¶10, I have argued against the interpretation of (109a) as 347a
an affricate and that of (109b) as a prenasalized stop.

(109) a. 

b. 

There is a serious problem with these representations. In an autosegmen- 347b
tal frame segments are dismantled, they are not unbreakable matrices of features, like in orthodox linear models. Thus the representations in (109) are spurious: the `t` and the `s` are meant to be mere abbreviations for two sets of features, a convention dating to at least the SPE. In an autosegmental representation, however, a "segment" is not only a set of features, but also the skeletal position these are associated with. Consequently, contour segments should look like (110), where the Greek letters stand for individual melodic primes.

(110) 

The second line of (110) contains what have been labelled ROOT NODES 347c
in feature geometry. It is suspect that the motivation for introducing root nodes is simply to retain the familiar notion of segments, not unreasonably, of course, complete assimilation, for example, is readily explainable by making reference to the delinking and spreading of root nodes. Unfortunately, having them leads to the possibility of unnecessary distinctions. One such case of overgeneration is given in (111).

(111) a. ×

b. 

(111a) is an empty skeletal position, (111b) is one with a root node that 347d
is empty. It appears to be unwarranted to distinguish these two cases. A

full-fledged feature geometry increases the generative power of a framework as is shown by statements like "there is no such thing as a representation with a bare Laryngeal node" (Lombardi 1995a : 41). The reason for this is the absence of any phonological contrast between two objects, one with and the other without a Laryngeal node. A similar constraint may be formulated to rule out (111b), but I think these facts show the excessive generative capacity of feature geometry, and are a good reason to discard the notion. Although, the useful side of the device — that it makes it possible that phonological operations only access one unit in the representation — also seems to be lost, a framework incorporating a very limited set of melodic primes is able to maintain the principle without having recourse to feature geometry.

To conclude: the representation of so-called contour segments as a **347e**
case of one-to-two association between a skeletal position and melody[158] appears very elegant in an autosegmental frame. However, with unary[159] primes representing melody the idea only works if the root node is assumed. This assumption, on the other hand, leads to unwantedly distinguished representations.

[158] These issues are not settled in the mainstream literature. All I want to say is that a noncontour analysis seems preferable to one that includes contour segments.

[159] With binary primes all one has to posit is that incompatible features (or feature values) are linked to the same slot, noncontinuant and continuant in the first case, (109a), and nonnasal and nasal in the second, (109b). In a proper unary-feature framework no two features are incompatible.

8.5 The glides of English

Glides and high vowels are usually conceived of as being distinct only on the skeletal tier — or above in frameworks that have an X tier. Representing the subskeletal portion of i/j as **I** and that of u/w as **U**, the representations in (112) can be posited. **348**

(112)

a.		b.		c.		d.	
	i		j		u		w
	V		C		V		C
	|		|		|		|
	I		**I**		**U**		**U**

It is important to note that i and u are not simply syllabic j and w. A syllabic consonant — it was claimed in section **6.3.1** — has the representation shown in (113). **349**

(113)
$$\begin{array}{cc} V & C \\ \searrow & | \\ & \alpha \end{array}$$

An obvious question that arises is what should be the interpretation of (113) if α is **I** or **U**. Comparing the following paradigms may provide an answer.[160] **350**

(114)

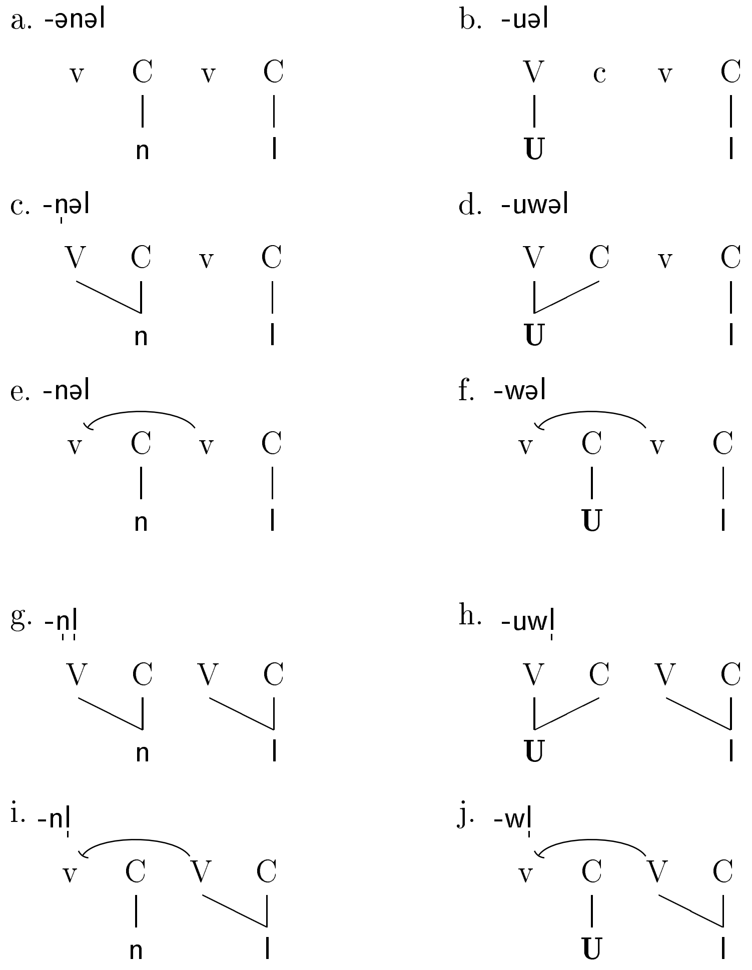
a.	*personal*	ˈpɜːsənəl	b.	*gradual*	?ˈgrædʒuəl
		ˈpɜːsn̩əl			ˈgrædʒuwəl
		ˈpɜːsnəl			ˈgrædʒwəl
		ˈpɜːsn̩l̩			ˈgrædʒuwl̩
		ˈpɜːsnl̩			ˈgrædʒwl̩
	personate	ˈpɜːsəneɪt		*graduate*	ˈgrædʒueɪt
		ˈpɜːsn̩eɪt			ˈgrædʒuweɪt
		*ˈpɜːsneɪt			*ˈgrædʒweɪt

As can be seen in (114) the variant pronunciations of these words match each other quite neatly. The lack of a perfect parallelism follows from the different starting points: in *personal* the n is lexically linked to a C **351**

[160] Except for the uw forms, all nonasterisked variants are given by Wells (1990). As for those, of the potential hiatus-filling glides Wells only indicates r, e.g., in *drawing* ˈdrɔːʳɪŋ, not w or j, e.g., in *following* ˈfɒləʊ(w)ɪŋ, *playing* ˈpleɪ(j)ɪŋ.

position, in *gradual* the u to a V position, as depicted in (115a–b). The rest of (115) shows the representations of the other alternants; only the alternating second halves of the words are given; the IPA symbols represent the subskeletal melodic content of the given position, i.e., n is the sum of melodic material which, *together with the C position dominating it,* is interpreted as n.

(115)



The doubtful grammaticality of the form ˈgrædʒuəl, (115b), may be attributed to a dispreference for successive empty positions. To cure the situation, the hiatus is filled by the melody of the preceding V position, (115d). Note that the hiatus is more acceptable in ˈgrædʒueɪt, where the 352 post-hiatus V position is not empty. In section **7.1.1**, ¶291, a similar situation in Malay was explained by the Antipenetration Constraint of (51), which blocks the government of the empty c position, hence keeping it consonantal. Incidentally, in English unstressed V positions are usually empty, hence both explanations are available.

A residual problem is how the **U** vacates its original V position to be exclusively associated with the following C position. The same difficulty was already touched upon in section **4.6.3**, ¶190, and no satisfactory solution was found. **353**

Let us return to the strange behaviour of the segments r w j in English, first noticed in footnote 117. The hypothesis is that syllabic consonant formation and, more strangely, syncope is possible in English only between consonants if the first is less sonorous than the second: cf. *kennel* ˈkenl̩ vs. *melon* *meln̩. Yet, we find forms like *barrel* ˈbærl̩, *narwhal* ˈnɑːwl̩ and *loyal* ˈlɔɪjl̩[161] and the GenAm forms *lawyer* ˈlɒːjɚ, *seignieur* seɪnˈjɚ,[162] *terror* ˈterɚ. This distribution is problematical for a sonority based account only if r w j are ranked on the same level as ɚ u i in the sonority hierarchy — a fairly standard assumption. Interestingly, the mirror images of these clusters, "lr̩ lw̩ lj̩ rj̩", do not contain syllabic glides, if anything, they would be lə/lɚ lu li ri, respectively. It was claimed above that glides are syllabic differently than other consonants: they are associated only to a V position, while the latter are doubly linked to a V and the following C position. If skeletal positions are an inherent part of the expression determining the identity of segments, then a glide, (116a), and the corresponding vowel, (116b), are quite different segments, as compared to a nasal, (116c), or l and their syllabic counterpart, (116d), which share much of their representation. **354**

(116)

	a.	b.	c.	d.
	j	i	n	n̩
	C	V	C	V C
	|	|	|	
	I	**I**	n	n

[161] Here again, Wells (1990) has ˈlɔɪ‿əl, without the possible hiatus-filling glide, j.

[162] Such forms are quite difficult for theories which claim that syllable structure is built on lexically given strings of segments during the derivation.

It follows from the representations in (116) that the place occupied **355**
by a glide and the corresponding vowel in the sonority hieararchy are not necessarily the same. In fact, if glides were ranked between (voiced) fricatives[163] and nasals, the significant differences in the behaviour of consonantal r w j and the vocalic ɚ u i would be explained.[164]

Evidence for the need to distinguish "syllabic glides," which are **356**
strictly speaking vowels and other syllabic consonants is provided by the following data: *terrorist* ˈterr̩ɪst vs. *cannon* *ˈkænn̩, *cardamum* *ˈkɑːdəmm̩, *parallel* *ˈpærəll̩.[165] Whatever blocks the emergence of $\mathrm{C}_i\underset{\scriptscriptstyle |}{\mathrm{C}}_i$ clusters in English, it is ineffective against rr̩ clusters. There are two candidates for doing the job. On the one hand, if syllabic consonant formation is possible only after a less sonorous segment then it follows straightforwardly that the process should be impossible after a segment identical to the one trying to become syllabic. However, if consonantal r is below nasals and vocalic r is among vowels in the sonority hierarchy, then rr̩ is expected to be grammatical, which it is.

The other explanation is more elaborate, though its conclusion will **357**
be similar. English does not stigmatize identical melodic material linked to adjacent nonidentical melodic positions, i.e., a C and a V in whatever order, cf. *yeast* jiː-, *beyond* -ɪj-, *woo* wuː, *Kuwait* -uw-. Now the source of rr̩ in English is exceptionlessly rɚ or rə — in rhotic and nonrhotic dialects, respectively — followed by a vowel. These sequences are just as grammatical as ji or wu. Consider the process represented in (117), where **R** is used for the subskeletal melody of r.

163 Let me mention in this respect the intimate relationship of voiced fricatives and glides, manifest in such practical symptoms as the fact that the IPA did not distinguish the voiced palatal fricative, ʝ, and glide, j, until very recently, and in many cases it still can only use the "lowered" diacritic if the contrast need be shown, e.g., ð vs. ð̞, obviously because the difference is not particularly significant. Furthermore, a voiceless approximant exhibits turbulent airflow (Catford 1988 : 68), i.e., it is a fricative!

164 Some researchers, e.g., Harris 1990, Scheer 1996, claim that the sonority hierarchy is a derivate of the internal structure of sounds. This is an agreeable view, the claim made here then is that glides ought to be represented in such a way that they find themselves between fricatives and nasals in the hierarchy.

165 For the last item ˈpærəlel is the usual form, but ˈpærələl is also possible.

(117) a. *terror* ˈterə/ˈterɚ

```
v   C   V   C   V   c
    |   |   |   |
    t   e   R   R
```

b. *terrorist* ˈterr̩ɪst

```
v   C   V   C   V   C   V   C   v   C
    |   |   |   |__/    |   |       |
    t   e   R   R       ɪ   s       t
```

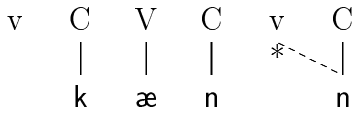
The idea that nonprevocalic r is lexically associated with a V position in English is pursued by Harris (1994 : 257ff, also cf. references there). The most convincing argument for this stance is the fact that just like before the other glides, w and j, the distribution of vowels before r is severely limited in most dialects of English.[166] It also follows from this claim that the difference between rhotic and nonrhotic dialects of English is not in the distribution of r, but in the phonetic interpretation of vocalic positions containing the melody **R**. Another spurious consequence is that the schwa (and other **R**-ful vowels of nonrhotic dialects) has two possible representations: an ungoverned/unburied empty vocalic position or one associated with **R** for schwa, and two Vs associated with ɑɑ and ɑr, ɔɔ and ɔr etc. for the others. To cure this unwanted state of affairs, one could claim that **R** in nonrhotic dialects can only be interpreted if linked to a licensed C on the skeleton, consequently, when this is not the case, it fails to get interpreted and it is the empty v slot that is pronounced or compensatory lengthening takes place. 358

[166] Scots is an exception, thus we may conclude that r is not a glide, but a "normal" consonant there. This is corroborated by the phonetic implementation of r in this dialect.

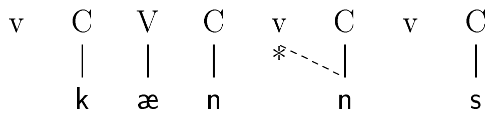
8.6 The domain of the OCP

Compare the representations of (117) with those of (118), depicting a geniune CC̩ cluster, whose first and second consonants are identical, using *canon* and *canoness*[167] as examples. 359

(118) a. *canon* ˈkænən/*ˈkænn̩

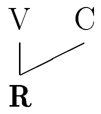


b. *canoness* ˈkænənəs/*ˈkænn̩əs

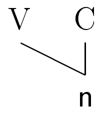


The data suggest that adjacent identical subskeletal melody is grammatical if lexically dominated by different types of skeletal position, but ungrammatical if dominated by the same type of skeletal position. That is, the factor responsible for ruling out some CC̩ clusters — the OCP is an obvious candidate for this role — takes into account not only subskeletal melody, but also the dominating skeletal point. The important difference between the two cases illustrated by (117) and (118) is shown in (119a) and (119b). 360

(119) a.



b.



Positing a difference between these two structures may seem arbitrary, but is supported by the divergent behaviour of the two types of syllabic consonants. Furthermore, the contrast is retrievable from the fact that (120a) is, (120b) is not an existing expression in English. 361

(120) a.

b.

[167] Of the numerous variants, ˌkænəˈnes, ˈkænənes, ˈkænənɪs, ˈkænənəs, I chose the last one where syllabic consonant formation would be possible were it not for the flanking consonants.

What remains unclear is why $C_i əC_i$ sequences are not ruled out by the same principle, if the representation of syncope-prone schwas is an ungoverned/unburied empty vocalic position. The stipulation that phonetically interpreted empty positions create a barrier for the OCP effect is descriptively inadequate. As (120) shows, it is not merely the interpretation or noninterpretation of the position that matters, but the source of the melody interpreted at that position is also relevant: it cannot be the following consonantal position in the case under discussion. **362**

8.7 Stricture and place/laryngeality

Theories of featural organization draw the conclusion that groups of features form natural classes, because they spread or delink simultaneously across languages: it is typically the same subsets that are affected by processes. Also certain features — or values thereof — are often mutually exclusive, thus interrelated. **363**

The common core of feature geometries, which aim at capturing these observations, is a trichotomy of melodic properties. The three groups are subsumed under the labels LARYNGEAL, PLACE and MANNER (e.g., Clements 1985). Grouping certain features under a manner node seems to have been a mistake, these features — [consonantal], [continuant], [nasal], [sonorant], [lateral], [strident] etc. — do not pattern together. The alternative offered by McCarthy (1988) is to make these features dependent immediately of the root node, the representative of the whole segment. The prediction made by this move is that these features as a class are affected only by processes that affect the whole of the segment. It is noteworthy that "manner" features are such that are never contrastive for vocalic segments: a vowel is always nonconsonantal, continuant, sonorant, nonlateral, nonstrident, etc.[168] Consequently, whatever their implementation, manner features will be excluded of V positions. **364**

One way of solving this situation is transferring these properties to the skeleton (e.g., Jensen 1994, Rennison 1997), i.e., claiming that the skeletal slot *is* the root node. The proposals made in section **4.3** about the meaning of Cs and Vs are a step in this direction: by claiming that Cs are inherently mute, being associated with a C is automatically interpreted as being noncontinuant. The empirical inadequacy of **365**

[168] Nasality may be contrastive for vowels. But then whether this feature is one of manner or of laryngeality is debatable.

such a framework is evident: there do exist continuant consonants. To account for the contrast, Jensen (1994) proposes that postconsonantal consonants are noncontinuant,[169] others are continuant, and to cater for non-postconsonantal noncontinuant consonants, he posits empty coda positions before the relevant onsets. Rennison (1997) is more precautious: he uses the head vs. dependent status of a so-called empty melodic element[170] to control the stricture properties of consonants (and the tongue root actions of vowels).

In the present framework it seems evident that the divergent consonantal properties of segments could be attributed to the different statuses a C position on the skeleton can find itself in. Recall, a C can be licensed and ungoverned, licensed and governed, unlicensed and ungoverned and unlicensed and governed. What remains to be encoded by subskeletal melodic primes is the place of articulation and the laryngeal properties[171] of sounds, both of which are encountered in consonants and vowels alike. Accordingly, the absence of licensing is expected to involve loss of place primes, i.e., debuccalization, and/or loss of laryngeal primes, i.e., devoicing, deaspiration, as predicted in section **7.1.2**. **366**

The implementation of the idea is no more explicit than that of Jensen's, much awaits to be done here. However, it is clear that by dispensing with manner features the theory reduces the number of melodic primes necessary, thus constraining its generating capacity — a much desired end. **366a**

[169] This is surprisingly reminiscent of Coda Mirror's idea that post-coda consonants are strong.

[170] Clearly, the original insight behind empty melodic elements is not such that they could be used as objects, but merely as signalling the absence of anything else (cf. Kaye & al. 1985).

[171] It is often claimed that the laryngeal features of consonants are responsible for tone contrasts in vowels.

SUMMARY

The main points argued for it the present dissertation are the following:

(1) if the quantitative and qualitative aspects of the sound flow are separated (skeleton and melody) and linked by association lines, then both are expected to occur without the other: melody without a skeletal position associated to it (floating melody) and skeletal positions without melody associated to them (empty skeletal positions);

(2) if empty skeletal positions exist, the skeletal pattern (syllable structure) may be radically simplified, to strictly alternating Cs and Vs;

(3) if skeletons uniformly contain strictly alternating Cs and Vs then they uniformly begin in a V and end in a C position: skeletons are made up of VC units;

(4) consonantalness is muteness, vocalicness is loudness;

(5) two forces operate between skeletal positions: licensing and government, both are strictly local and unidirectional (i.e., for a skeletal position α to license/govern a skeletal unit β, the skeletal unit containing α must immediately follow the skeletal unit containing β);

(6) licensing helps sustain melodic material associated with its target; government spoils the inherent properties of its target;

(7) vowels are inherently endowed with the power to govern and license;

(8) a V can govern either an empty V or a C, a V can license a C or a V through an empty C, a C can govern a C through an empty V, a C can license a C; V-to-V licensing and C-to-C government (language-specific options) constitute burial domains, the enclosed empty position is buried; in some languages government cannot penetrate the preceding foot; in some languages one skeletal unit cannot belong to two burial domains;

(9) governed and/or buried positions are dead; dead positions neither govern, nor license;

(10) governed and/or unlicensed C positions are prone to lenite: governed C positions lose their inherent muteness and become more sonorous, unlicensed C positions lose melodic material, they debuccalize and/or lose their laryngeal properties.

ÖSSZEFOGLALÁS

Jelen disszertációban a következőket állítom:

(1) ha elkülönítjük a hangfolyam mennyiségi és minőségi jelenségeit (a hangvázat és a dallamtengelyt) és kapcsolatukat vonalakkal jelöljük, akkor azt várjuk, hogy mindkettő előforduljon a másik nélkül is: dallam vázpont nélkül (lebegő dallam) és vázpont dallam nélkül (üres vázpont);

(2) ha léteznek üres vázpontok, akkor a hangváz mintázata (a szótagszerkezet) gyökeresen leegyszerűsíthető, szigorúan váltakozó C (mássalhangzó) és V (magánhangzó) pontokra;

(3) ha a hangváz egységesen szigorúan váltakozó C-ket és V-ket tartalmaz, akkor V-vel kezdődik és C-vel vegződik: a hangvázat VC (váz)egységek alkotják;

(4) a mássalhangzósság némaság, a magánhangzósság hangosság;

(5) a hangváz pontjai között két erő hat: a jogosítás és a kormányzás, mindkettő szigorúan helyi jellegű és egyirányú (azaz α vázpont akkor jogosíthatja/kormányozhatja β vázpontot, ha az α-t tartalmazó vázegység rögtön a β-t tartalmazó után következik);

(6) a jogosítás segít a jogosítottal összekapcsolt dallamanyag megtartásában; a kormányzás tönkreteszi a kormányzott sajátságos tulajdonságait;

(7) a magánhangzók sajátságos tulajdonsága, hogy kormányozni és jogosítani tudnak;

(8) egy V vagy egy üres V-t, vagy egy C-t kormányozhat, egy V vagy egy C-t, vagy egy üres C-t átugorva egy V-t jogosíthat, egy C egy üres V-t átugorva egy C-t kormányozhat, egy C egy C-t jogosíthat; a V—V jogosítás és a C—C kormányzás (amelyek nyelvsajátos lehetőségek) sírt alkotnak, az általuk közrezárt üres vázpont el van temetve; néhány nyelvben a kormányzás nem hatolhat bele más lábakba; néhány nyelvben egy vázegység nem tartozhat két sírba;

(9) a kormányzott vagy eltemetett vázpontok halottak; a halott vázpontok se nem kormányoznak, se nem jogosítanak;

(10) a kormányzott vagy jogosítatlan C vázpontok gyöngülésnek vannak kitéve: a kormányzott C-k elveszítik sajátos némaságukat és hangzósabbá válnak, a jogosítatlan C-k elveszítik dallamtartalmukat, azaz, képzési helyüket vagy gégefő-tulajdonságaikat (zöngésség, hehezettség).

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