Chapter X
The Coda Mirror completed

1. Introduction

For the past couple of years, we have been developing a theory of lenition and fortition that is called the Coda Mirror (Ségéral & Scheer 2001a). The central empirical object that it sets out to explain is the so-called Strong Position, i.e. the disjunction that unites word-initial consonants and those that occur after Codas: {#,C}__. Classical syllabic tools fail to even describe the Strong Position, let alone to explain it: consonants in both locations belong to Onsets, but so do intervocalic consonants which are weak. We call the disjunction at hand the Coda Mirror because it is exactly symmetric with respect to the Coda, both descriptively (compare {#,C}__ with __{#,C}) and regarding the effect produced (strength vs. weakness). We have argued that a specific view on syllable structure which roots in Government Phonology and is known as CVCV allows to approach the challenge raised by the Strong Position with greater success.

While the initial version of our theory was centred on the Strong Position disjunction, over the years we have acquired a sharper view on the variation of lenition patterns that are found in natural language and seem to be resident. In chapter XXX (Ségéral & Scheer) we have tried to nail down the two essential sources of cross-linguistic variation that emerge: word-initial consonant may or may not be strong (for example, they are strong in Romance and Germanic, but weak in Greek), and consonants after a sonorant Coda show the same variation (they are sometimes strong as in French, but weak at other times as in Greek and in Grimm's Law). Most of the facts are well known, discussed here and there, but to our knowledge they have not been bundled in order to serve for the study of lenition so far. We are


2 Here an henceforth "lenition" is shorthand for "lenition and fortition".
thus keen to implement these insights into Coda Mirror theory, which of course must be able to express the variation at hand. This is our first goal in the present chapter.

The proposal that we come up with for the parameter on the strength of word-initial consonants is already present in Lowenstamm's (1999) initial article on the phonological identity of the beginning of the word: the hatch-mark identifies as an empty CV unit which may or may not be active in a given language. While the motivation for Lowenstamm's idea came from the restrictions on word-initial clusters (some languages only allow #TR, others tolerate both #TR and #RT), it makes the correct predictions regarding the lenition of word-initial consonants. In the meantime, however, the treatment of the beginning of the word has been generalised: Direct Interface (to be introduced below) holds that any kind of phonologically relevant extra-phonological information materialises as truly phonological objects.

This take on how interface relations work also bears on the second phenomenon that needs to be implemented into Coda Mirror theory: stress. Although of course we knew that stress may be a factor in lenition processes, the initial version of the Coda Mirror does not address this issue. We now set out to fill in this gap, again guided by a disjunction that appears to be resident cross-linguistically: consonants are often strong when they occur either word-initially or in tonic environments. Since we know that the beginning of the word is an empty CV unit, we conclude that stress materialises in the same way: identical effects are good reason to suppose identical causes. Note that this takes us back to Direct Interface since unlike in classical treatments, stress now has a truly phonological incarnation.

In short, thus, the present chapter presents an improved version of the Coda Mirror, which is inserted into a broader picture both regarding empirical variation and conceptual tools. We begin in section 2 by recalling the Coda Mirror as it stands. Sections 3 (word-initial consonants) and 4 (consonants that occur after sonorants) discuss the two parameters on lenition that have been mentioned, while section 5 is concerned with stress. Some concluding remarks in section 6 close the chapter.

2. The Coda Mirror as it stands

Let us thus start by recalling the major features of the Coda Mirror. The empirical situation has been extensively exposed in the references quoted,
as well as on various occasions in this volume (chapters XXX Ségéral & Scheer, XXX De Lacy & Bye, XXX Honeybone). We may thus take the relevant record for granted. As far as positional influence is concerned, the following table summarises the empirical generalizations for the five positions in which a consonant may occur.3

\[
\begin{array}{ll}
\text{position} & \text{usual name} \\
\hline
\text{a.} & \underline{\#V} \quad \text{word-initial} \\
\text{b.} & \text{VC.} \underline{\_V} \quad \text{post-Coda} \\
\text{c.} & \text{V.} \underline{\_C} \text{V} \quad \text{internal Coda} \\
\text{d.} & \text{V.} \underline{\_} \# \quad \text{final Coda} \\
\text{e.} & \text{V.} \underline{\_V} \quad \text{intervocalic}
\end{array}
\]

The five contexts cluster in such a way that two disjunctions emerge: the Coda "word-finally and before a heterosyllabic consonant" \(\underline{\#,C}\) and the Strong Position "word-initially and after a heterosyllabic consonant" \(\underline{\#,C}\). The striking fact is that these disjunctions not only are the exact mirror image of one another as far as their structural description is concerned. They also produce opposite results: weakness in the former, strength in the latter case. As was mentioned in the introduction, this is why we call the Strong Position the Coda Mirror, and the symmetric situation the mirror effect.

Lenition has received quite some attention in the OT literature, following essentially two conflicting tracks: an "abstract" and a "grounded" one. The former is represented by Jill Beckman's notion of Positional Faithfulness, while the latter, cue- and effort-based and denying the relevance of syllable structure in the first place, is advocated most vigorously by Donca Steriade, Bruce Hayes and Robert Kirchner (Hayes 2004).4

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3 The only logically possible position that is left unconsidered concerns what is traditionally referred to as branching Onsets, i.e. TR clusters (in this article, T refers to any obstruent, R to any sonorant). Lenition phenomena here are hard to come by, and the phenomenon deserves an independent article. Data that seem to converge towards a certain behaviour of TR clusters are discussed in chapter XXX (Jaskula), in section 2.7 of chapter XXX (Ségéral & Scheer) and in Ségéral & Scheer (1999); an analysis appears in Scheer (forth).

Surprisingly enough, a common feature of this literature is the fact that the very basic Strong Position disjunction, known since the 19th century, is simply absent. The authors at hand seem to have overlooked the fundamental empirical fact that post-Coda consonants are strong. Even specialised work on fortition (Smith 2002, 2004) does not mention the Strong Position disjunction as a relevant linguistic object. Instead, the empirical basis for segmental strength regularly reduces to "the beginning of X" where X can be the word, the syllable, the morpheme, the root, the stem, the foot, the prosodic word or any other relevant phonological unit. Steriade (1997) for example contains a host of phenomena where the word-initial and the post-consonantal location form a descriptively critical disjunction, a fact that is not exploited by the author. On the contrary, Steriade (1997:99) concludes that "we have presented arguments establishing that syllable position does not condition laryngeal neutralization. It would in fact be surprising if it did: there is no a priori reason why being in the onset is better for any feature than being in the coda or indeed somewhere outside of the syllable". The same diagnostic can be made for Kirchner’s (1998:8ff) work: the post-Coda position is simply absent from his cross-linguistic survey of positional influence on lenition.

Coming back to the more accurate empirical picture that acknowledges the existence of the Strong Position disjunction, the challenge raised is fourfold (see chapter XXX Ségéral & Scheer).

(2) challenges for phonological theory

a. the Coda Mirror disjunction needs to be reduced: the identity of the two contexts is a single phonological object. This task is exactly parallel to the one that was central in the advent of autosegmental and syllabic theory, i.e. the reduction of the Coda disjunction to the single phonological object "Coda".

b. the mirror effect the phonological objects that represent the Coda and its Mirror must somehow reflect their antagonicity: a solution where they are in no way symmetric will not do.

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5 Which isolates the categories lenition in word-final position (14 languages), in Coda position (5 languages), fortition/blocking of lenition in word-initial position (17 languages), in Onset of stressed syllable (6 languages), phrase- or utterance-initial blocking of lenition (4 languages).
challenges for phonological theory

c. who is who
   the Coda is weak, its Mirror strong: obviously this pairing is not accidental. Hence theory must be able to explain why this causal relation governs language, rather than the reverse.

d. two different weak positions
   theory must be able to assign two different phonological identities to the Coda and the intervocalic position: both are weak, but crucially distinct.

Adopting the syllabic theory known as CVCV and Lowenstamn's (1999) idea that the beginning of the word is an empty CV unit, a uniform response to the four challenges can be provided. It is not our purpose here to introduce the theoretical tools mentioned in any greater detail. The general (anti-diacritic) philosophy of which the "initial CV" is a manifestation is discussed at greater length in sections 3.2 and 3.3. CVCV was introduced by Lowenstamm (1996); it is an offspring of Government Phonology (GP), actually its most radical expression: the genuine idea of Standard GP (Kaye 1990, Harris 1994) holds that syllable structure is expressed by lateral relations among segments, rather than by arboreal hierarchy. The lateral relations at hand are Government and Licensing. While Standard GP was a hybrid model where syllabic generalisations were conjointly expressed by "old" arboreal structure and "new" lateral relations, the functional load is entirely shifted onto the latter device in CVCV. As a result, syllable structure is flat, and an empty Nucleus separates any two consonants that are adjacent on the surface: constituency boils down to a strict sequence of non-branching Onsets and non-branching Nuclei.

Consider below how the five relevant consonantal positions are represented in this kind of environment, starting with the Coda Mirror (target consonants are boldfaced).

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(3) consonants in the Coda Mirror: ungoverned but licensed
   a. initial consonant __G vt
      C V - C V ... # C V
   b. post-Coda consonant G vt
      C V C V ... V C V

As may be seen, both word-initial and post-Coda consonants occur after
an empty Nucleus. Table (4) below depicts the situation of the three re-
maininng positions. Its examination shows that no consonant outside the
Coda Mirror occurs after an empty Nucleus.

(4) consonants in Codas: ungoverned and unlicensed
   intervocalic consonants: both governed and licensed
   a. internal Coda __G vt C V C V C V ... V C V
   b. final Coda __G vt C V C V ... V C V
   c. intervoc. V__G vt V C V C V ...

Looking now at the Coda disjunction, it appears that Coda consonants
occur before an empty Nucleus, and that this property is not shared by any
other position. Intervocalic consonants, finally, are not adjacent to any
empty Nucleus and therefore distinct from all other positions as well.

In sum, thus, the object whose distribution properly divides the five
relevant positions into three groups are empty Nuclei: the identity of the
Coda Mirror is ø__, the Coda is defined by __ø, while the intervocalic posi-
tion has only contentful neighbours. By the same token, satisfactory re-
sponses to three of the four challenges raised under (2) are provided: 1) the
Coda Mirror disjunction is reduced to a single phonological object (2)a; 2)
the mirror effect (2)b is faithfully reflected at the level of the non-
disjunctive phonological objects since the Coda __ø has the exact symmetric identity of its Mirror ø__; 3) there are indeed two ways of being weak (2)d: as demanded, the theory distinguishes between the two weak positions, i.e. the Coda and the intervocalic location.

We are thus left with (2)c: why does ø__ provoke strength, rather then weakness, and __ø as well as two contentful neighbours weakness, rather than strength? In order to see this, we need to look at how the two lateral forces Government and Licensing work.

The ground rule in Government Phonology is that Nuclei can only be empty if they are governed.7 Government is head-final, and only phonetically expressed Nuclei are good governors. Therefore two or more empty Nuclei in a row cannot exist. While only Nuclei can be the source of Government, both Nuclei and Onsets can be its target. The crucial difference here is that unlike empty Nuclei, empty Onsets "are for free", i.e. do not require any special care. Therefore under (3) the Nucleus following consonants in Strong Position is called to govern its preceding peer, which is empty. As a consequence, it cannot govern its own Onset. A second lateral force that is also familiar from the (Government Phonology) literature, Licensing, remains untouched by this configuration: the Nucleus in question has no specific Licensing duties and hence licenses its own Onset. All in all, a consonant in Strong Position is thus licensed but ungoverned.

The effect of the two lateral forces at hand is known independently from lenition. Government is responsible for vowel-zero alternations: the alternating Nucleus is phonetically unexpressed if it is struck by Government. Hence this lateral force inhibits the phonetic expression of the lexically available vocalic melody. Licensing on the other hand has the reverse effect: it lends support to its target.8 In sum, thus, Government and Licensing are antagonistic forces: while the former inhibits the melodic expression of its target, the latter promotes it.

On this count, then, the segmental health of consonants in the Coda Mirror is maximal since they escape diminishing but are promoted by Licensing. The same calculus can be made for the weak positions: Coda consonants (4)a,b are both ungoverned and unlicensed because their Nucleus is

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7 Other circumstances allowing for empty Nuclei are discussed by Kaye (1990, 1992), Gussmann & Kaye (1993) and Scheer (2004a:§14). The situation of word-final empty Nuclei, which seem to escape Government, is considered in section 3.4.

8 The properties of the two lateral forces, as well as the way they were used in the past, are introduced more carefully in Scheer (2004a:§136).
empty and hence unable to head any lateral relation. Consonants in intervocalic position (4)c, on the other hand, are both governed and licensed: their Nucleus is contentful but has no governing duties to observe.

The question raised in (2)c is now answered: given Government and Licensing, the Coda Mirror is necessarily strong, while the two weak position are necessarily weak(er). It is true that there is no obvious ranking of the two weak positions. But in any event they are 1) weaker than the Strong Position and 2) distinct, thereby responding to (2)d. Finally, note that the theory does not make any absolute predictions regarding the strength of consonants: as was pointed out in chapter XXX (Ségéral & Scheer), consonants in strong position may well be subject to lenition, as much as their peers in weak positions may strengthen. In line with this situation, the only prediction made by the Coda Mirror is relative: if there is lenition in a strong position, consonants in weak position will lenite at least as much; in case of strengthening in a weak position, strong consonants must strengthen at least as much. In other words, the Coda Mirror is at least as strong as the weak positions.

Finally, before turning to the influence of non-phonological factors on lenition, it is useful to recall that the existence of the Strong Position in itself is strong evidence against the familiar syllabic inventory. That is, approaches operating with Rhymes and Codas are unable to even reduce the disjunction {#,C}__: the two consonants in question certainly belong to Onsets, but so do intervocalic consonants. Hence the Strong Position may be assigned a single, but not by a unique syllabic identity. The two further challenges (2)b and (2)c, building on the result of the reduction of {#,C}__, thus cannot even be addressed. We believe that the reason of this failure is the existence of precisely those empty Nuclei that define the respective identities of the Coda and its Mirror in the theory that we have exposed.

3. The variable behaviour of word-initial consonants

The first cross-linguistic variation discussed in chapter XXX (Ségéral & Scheer) concerns the behaviour of word-initial consonants. Recall that they are strong in some languages, typically in Romance and Germanic for example, but weak in others (e.g. in Greek). Before being able to address this

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9 In fact there is good reason to believe that the Coda is weaker than the intervocalic position (cf. Seigneur-Froli 2003).
issue, a fairly space-consuming introduction to Direct Interface is in order. Direct Interface is the theory of how phonology interacts with other modules that we follow.

3.1. Direct Interface: how phonology communicates with higher modules

3.1.1. Phonology alone rules inside morphemes, other modules interfere at morpheme edges

Let us now look at the variation that, unlike inside morphemes, is found at morpheme margins. The empirical situation has been introduced in section 3 of chapter XXX (Ségéral-Scheer): while the three morpheme-internal positions show invariable behaviour across languages (intervocalic consonants and internal Codas are always weak, post-Coda consonants are always strong), those positions that are adjacent to a morpheme margin sometimes go along with the internal partner of their respective disjunction (word-initial consonants are strong, final Codas are weak), but at other times part company (word-initial consonants are non-strong, final Codas are non-weak).

This distribution suggests that there is a domestic phonological law which rules inside morphemes, an area invisible to higher modules and therefore guaranteed against their intervention. This domestic law is also active at morpheme margins, but here cohabitates with morphological and syntactic bearing on sound, which may interfere and alter the course of "native" phonology. Every phonologist knows in fact that this distinction extends beyond the particular phenomenon of lenition: it is more generally true that the "regular", "usual", "unsurprising" phonology is found morpheme-internally, while "strange", "irregular" and "unexpected" things happen at morpheme edges. Relevant examples include the high tolerance of consonant clusters word-finally (but not word-initially) (e.g. in English: *sixths*), or the fact that the first vowel of the word (but not the last) in many languages is unable to alternate with zero. Also, it is clear from these two examples that the two margins are not only special and different from domestic morpheme-internal law; they are also distinct from one another since they do not produce the same effects at all.

We therefore need an interface theory that is grounded on the difference between a purely phonological conditioning that remains entirely uninformed of morphological and syntactic factors, and a phonology of edges
where the same domestic law rules, but which in addition is subject to interventions from higher modules.\(^{10}\)

3.1.2. No pink panthers in phonology (or anywhere else in linguistics)

Another necessary property of such a theory, we submit, is the absence of diacritics. It is obvious that objects such as "\(^{\#}\)" and the like, crucial for the formulation of many phonological processes, are arbitrary and have just the same linguistic value as pink panthers. All scientific theories allow for diacritics as placeholders of objects or realities whose identity is yet unknown. But only phonology, it seems (within linguistics, neither syntacticians nor semanticists would take diacritics for real), is ready to work with pink panthers. Departing from this tradition, we rather need to discover what diacritics stand for, i.e. which linguistic reality they hide.\(^{11}\)

Following this track, extra-phonological information that is phonologically relevant must be represented in some other way. That is, whatever the interface looks like and however it works, its output must be truly phonological objects. A truly phonological object is one that exists in domestic phonology anyway, i.e. independently of any issue related to extra-phonological information, which has known properties and therefore makes predictions as to its action and reaction in phonology.

In the generative tradition, essentially two approaches to interface information exist. Lexical Phonology (Kiparsky 1982) replaces some, but not all diacritics by a procedural mechanism: rather than being representational objects, morpheme boundaries are embodied as successive derivational levels, and interface-sensitive rules make reference to levels rather than to linguistic objects. The other approach is known as Prosodic Phonology (Selkirk 1981, Nespor & Vogel 1986). Here, the "old" linear diacritics "\(^{\#}\)"

\(^{10}\) The locus of variation under study here is the beginning of the word. Of course, the other end of the word also requires an analysis along these lines (i.e. Direct Interface, to be introduced shortly). Space restrictions preclude further discussion of how lenition-relevant phenomena at the end of the word such as those that are usually treated by extrasyllabiety are accounted for in Direct Interface. Full detail appears in Scheer 2004a:§524, 2005a,b, forth).

\(^{11}\) More detailed discussion regarding the need of eliminating diacritics from (phonological) theory appears in Scheer (1999, 2000a, 2004a:§83, 2005a,b, forth).
etc. are replaced by the Prosodic Hierarchy, a new diacritic whose major (and meritful) property is to be autosegmental.12

The diacritic character of the Prosodic Hierarchy is obvious from the fact that the existence of its categories (the Phonological Word etc.) makes no phonological prediction at all: there may well be a rule that deletes the first vowel of a word at a Phonological Word boundary, and another which inserts a vowel in this context. That is, anything and its reverse can happen. Were the output of the interface truly phonological objects, hard predictions would be made since phonology would be able to interpret them, actually would be forced to do so. Take the two processes mentioned, one systematically deleting the first vowel of words (V → ø / #C__CV), the other on the contrary inserting a vowel in a word-initial consonant cluster (ø → V / #C__CV). It does not take a lot of experience to see that the latter represents natural phonological activity, while the former is not on record. The problem is that the critical object, "#", makes no prediction whatsoever: a vowel could be deleted just as much as it could be inserted; no part of the (interface) theory objects against writing the martian rule. The same is true for the units of the Prosodic Hierarchy: any process and its reverse may be triggered or inhibited by their presence.

3.2. Direct Interface and the beginning of the word

In contrast to that, firm predictions are made when the output of the interface are truly phonological objects. The corresponding interface theory, Direct Interface, is exposed at greater length in Scheer (2005a,b, forth). The relevant object for the present purpose is the initial CV that has been introduced earlier: Lowenstamm's (1999) idea is that the beginning of the word materialises in phonology as an empty CV unit, hence "# = CV". Unlike "#" or the Phonological Word, a CV unit is not a diacritic since it exists independently of any interface issue and may (must) be interpreted by the phonology. It therefore makes predictions, in our case the impossibility for the first Nucleus of the word to be empty: if the first V of a [#CVCV] root were emptied, the presence of the initial CV would create an ill-formed sequence of two empty Nuclei (øCøCV).

12 A more complete and detailed overview of the different interface theories that have been developed in structuralist and generative thinking appears in Scheer (forth).
Now suppose that the extra-phonological information "beginning of the word" is not always sent down to phonology. In other words, the interface "decides" whether or not some higher level information is visible in the phonology. We know for example from lexical strata that this is the case anyway: a morphological boundary may (pärent-hood where the boundary coming with -hood alters the regular course of phonology) or may not (parënt-al which bears penultimate stress just as if there were no boundary, cf. pärent) be visible in the phonology, and the same is true for syntactic divisions. In the case of the initial CV, every language decides whether it is sent down to phonology or not.\textsuperscript{13} Consider under (5) the ensuing contrast and the associated predictions made by the Coda Mirror.

(5) word-initial situation in languages with and without the initial CV

\begin{center}
\begin{tabular}{lc}
\hline
a. languages possessing the & b. languages lacking the initial \\
initial CV & CV \\
\hline
\end{tabular}
\end{center}

\begin{center}
\begin{tabular}{c}
\hline
\begin{array}{c}
\text{Gvt} \\
C \ V \ - \ C \ V \ \ldots \\
\uparrow \ \\
\# \ \\
L \ \text{Lic} \\
\end{array} \\
\hline
\end{tabular}
\end{center}

\begin{center}
\begin{tabular}{c}
\hline
\begin{array}{c}
\text{Gvt} \\
\# \ \\
C \ V \ \ldots \\
\uparrow \ \\
\text{Lic} \\
\end{array} \\
\hline
\end{tabular}
\end{center}

As may be seen, word-initial consonants are not supposed to be strong in languages where the initial CV is not distributed: being both governed and licensed, they ought to have exactly the same status as intervocalic consonants. We submit that the variation regarding the strength of word-initial consonants that was described in chapter XXX (Ségéral & Scheer) is controlled by this binary choice. The parameter at hand is actually \textit{predicted} to exist in a theory where 1) the output of the interface are truly phonological objects which 2) may or may not be shipped off to phonology on a language-specific basis. That is, as soon as the beginning of the word

\textsuperscript{13} Lowenstamm (1999) takes the CV to be always present, activated in some languages, unactivated in others. In the latter case, it has no effect in the phonology, i.e. is invisible. Both scenarios are empirically equivalent; we go along with privativity for reasons of economy. Further discussion appears in Scheer (2000:273ff), Seigneur-Froli (2003, in press).
identifies as an empty CV unit, privativity ensures that there must be languages with and without it.

The theory presented thus predicts 1) that there must be some variation regarding the strength of word-initial consonants and 2) that in languages without the initial CV initial consonants are weak. The former is obviously correct; in order to assess the latter we need some independent means of detecting the presence of the initial CV – we show below that this prediction is correct as well.

Finally, the evidence from languages where initial consonants are weak that we are aware of, Greek and North-Eastern dialects of Polish (see sections 3.2 and 3.3 of chapter XXX Ségéral & Scheer) does not allow to decide whether our prediction correctly discriminates between the two weak positions: both languages produce the same result word-initially, intervocally and in Codas. Recall that in absence of the initial CV, we predict word-initial consonants to behave like their intervocalic peers (since they are both governed and licensed), not like Codas.

Let us now discuss the fact that the predictions made by the parameterisation of the initial CV reach much farther than the variation of the strength of word-initial consonants. For reasons that due to space restrictions cannot be exposed here (see Scheer 1999, 2000a,b, 2004a:§§102, 402, forth), typical Indo-European restrictions on initial consonant clusters (#TR-only languages, i.e. allowing for #TR, but not for #RT, #RR or #TT) stem from the presence of the initial CV, while the lack of the initial CV produces anything-goes languages (e.g. Moroccan Arabic where any two consonants make a good beginning of the word). Finally, yet another empirical effect is controlled by the parametric variation of the initial CV according to the theory: the first vowel of a word (i.e. V₁ in #CV₁CV₂…) cannot alternate with zero when the beginning of the word has a phonological exponent. As was mentioned earlier, the ensuing øCoCV sequence is ill-formed because the first phonetically expressed Nucleus cannot simultaneously govern two empty Nuclei. In case the initial CV is absent, however, nothing prohibits the first vowel of a word to alternate with zero (as is typically the case in Slavic, e.g. in Polish pies - ps-a "dog.NOMsg, GENsg").¹⁴

¹⁴ Note that the situation where the first vowel of certain words alternates with zero is very different from the one that has been described earlier, i.e. where a rule deletes all first vowels of words not because they are lexically specified as alternating items, but because they are the first vowel of a word. Such a rule
In sum, thus, the parameterisation of the initial CV has (at least) three empirical consequences, which necessarily coincide:

(6) empirical consequences of the parameterisation of the initial CV

<table>
<thead>
<tr>
<th>in a language where the initial CV is present</th>
<th>in a language where the initial CV is absent</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. word-initial consonants are strong</td>
<td>word-initial consonants are non-strong</td>
</tr>
<tr>
<td>b. if there are initial clusters,</td>
<td>#TR as well as #RT clusters may exist</td>
</tr>
<tr>
<td>only #TR sequences exist</td>
<td></td>
</tr>
<tr>
<td>c. first vowels of words may not alternate with zero</td>
<td>first vowels of words may alternate with zero</td>
</tr>
</tbody>
</table>

Note that these predictions are non-trivial: they chain together three empirical situations that otherwise are not supposed to contract any necessary relationship. Also, they are empirically explicit and may be easily falsified: any language that displays one of the three properties of the righthand or the lefthand column under (6) must also instantiate the two other properties of the same column. We have checked languages that we are familiar with, and results are encouraging (even though most of the time there are only valid diagnostics for two of the three criteria). For example, initial consonants are always strong in typical #TR-only languages such as Romance and Germanic (see chapter XXX Ségéral & Scheer). On the other hand, many (but not all) Slavic languages such as Polish, Czech or Russian allow for initial #RT clusters. In the same languages, typically the first vowel of words may alternate with zero (e.g. Polish pies - ps-a "dog NOMsg, GENsg"), and in North-Eastern dialects of Polish (see chapter XXX Ségéral & Scheer), the one case where we have a reliable diagnostic, initial consonants are weak. By contrast, in a language like Belorussian that happens to be #TR-only, the typical Slavic vowel-zero alternations are accompanied by a vocalic prothesis when they concern the first vowel of a word: lav - i-lv-a "lion NOMsg, GENsg".

Finally, a non-trivial prediction is made to the effect that in a language where some #RT clusters exist but others are absent, the latter represent accidental, not systematic gaps. That is, the presence of one single #RT item implies the absence of the initial CV, which means that grammar does remain indescribable by the theory presented since it would require reference to the beginning of the word, which precisely leaves no trace in a language where first vowels may alternate with zero.
not object against any #RT cluster. Hence if some #RT sequences are missing, they are simply uninstantiated lexical possibilities that could well come into being tomorrow. Based on North-Eastern Demotic dialects, Seigneur (forth) shows that there is good reason to believe that this is indeed the case in Greek, where only a small subset of #RT clusters exist on the surface (#pt, #kt, #mn etc. in Ancient Greek).

4. The variable behaviour of consonants after sonorants

The second cross-linguistic variation discussed in chapter XXX (Ségéral & Scheer) concerns the behaviour consonants that occur after sonorant Codas. Recall that post-Coda consonants are strong after obstruent Codas in all languages, but that on a language-specific basis they may either be strong or weak when preceded by a sonorant.

4.1. There should be no melodic influence on lenition in the first place

In section 4.4 of chapter XXX (Ségéral & Scheer) we draw attention to the fact that the influence on lenition by a melodic property of sound is incompatible with the basic definition of lenition as a positional phenomenon: positional conditioning is crucially independent of any melodic influence originating in an adjacent item; also, no melodic primes are exchanged among segments.

A blurred positional vs. adjacency distinction, which is otherwise clear-cut, is a problem in itself: no phonologist can be happy with this state of affairs. Fortunately, however, only sonority has bearing on lenition: no other melodic property (such as, say, labiality, frontness or palatality) seems to ever influence the strength of an adjacent consonant. The conclusion that we have drawn in chapter XXX (Ségéral & Scheer) is that sonority is not a melodic property at all: it is different in kind from labiality, palatality, nasality and the like. This solution saves the generalisation "lenition is independent of any melodic influence". Quite strikingly, it is also supported by a serious cross-linguistic generalisation from another area: stress placement is conditioned by syllabic factors, but may also depend on the sonority of both vowels and consonants – but it appears to be entirely independent of any other melodic factor. This empirical generalisation is known for consonants: there is a sub-case of Weight-by-Position where
sonorant, but not obstruent Codas make their syllable heavy (e.g. Wilson 1986, Zec 1995:103ff). The same pattern has also been evidenced for vowels (de Lacy 2002:93): sonority, but no other property of vowels may influence stress placement. It is hard to believe that sonority, on these two counts and entirely independently from one another, is singled out as the "bad guy" by accident.

Hence we believe that there is good reason to ground our analysis on this assumption: sonority is not a melodic prime. This statement is actually a basic assumption in Government Phonology where, unlike in feature-geometric models, sonority has always been a derived category, dependent on a notion called Charm in the earliest versions of the theory, later on the notion of complexity (i.e. the number of primes that a segment is made of) (see Harris 1990, Scheer 1999, 2004a:§46). Hence there could not be any contamination of the target consonant by a sonority prime of its neighbour. Therefore the only way to describe the influence is to recur to truly positional means.

4.2. Syllable-relevant effects of sonority

In order to see how this insight could be fleshed out, it is useful to broaden the picture: what kind of syllable-relevant effects of the opposition sonorant vs. obstruent are there? Other than our target phenomenon, sonority-sensitive lenition, we have already mentioned stress placement.

Of course, this list must be completed by the most obvious consequence of sonority for syllable structure: sonority sequencing. That is, syllable structure is a direct function of the sonority slope of consonant clusters. Also, another cross-linguistically recurrent feature is the restriction of certain syllabic positions to a particular subset of segments. Typically, the subsets in question are defined along the lines of sonority. 15

But the syllabic effect that we believe provides the most useful indication comes from the behaviour of syllabic consonants. In most languages where consonants may have a vocalic function, only sonorants can be syllabic. A stronger claim, i.e. that obstruents may never be syllabic in any

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15 For example, in some languages only sonorants can occupy Codas. Evidence regarding Coda restrictions is discussed for example in Itô (1986: 26ff) and Piggott (1999); Blevins (1995: 227ff) offers a survey of the relevant literature.
language, is disputed. In any event, the following implicational relationship holds true: if syllabic obstruents occur in a language, then syllabic sonorants will also be found; the reverse is not true.

The usual way of representing syllabic consonants relies on their functional status: since they behave like vowels, they are found in Nuclei. This, however, violates a fundamental autosegmental principle according to which vowelhood and consonanthood are not determined by any melodic specification in the featural make-up of a segment. Rather, a high front articulation will be interpreted as [j] if it belongs to a consonantal constituent, but as [i] if it is associated to a Nucleus. Therefore, something that belongs only to a Nucleus could not, physiologically speaking, come out as a consonant. This, however, is precisely the challenge raised by syllabic consonants: they endorse vocalic function while still being a consonant physiologically.

An alternative that does justice to both the function and the body of syllabic consonants is explored in a growing body of literature, including Wiese (1996), Hall (1992:35f), Harris (1994:224f), Rowicka (2003), Szigetvári (1999:117ff) Blaho (2001) and Scheer (2004a:§240, in press). In this approach, syllabic consonants, like all other consonants, sit in Onsets; their syllabic behaviour stems from the fact that they branch onto a neighbouring Nucleus. It is through this vocalic perfusion that they acquire vocalic properties.

4.3. Three effects, one solution: sonorants may branch on Nuclei

We believe that the branching solution in fact offers a uniform explanation for all syllable-related effects of sonority. Consider under (7) below the difference between a sonorant and an obstruent Coda in CVCV.

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16 Candidate languages with syllabic obstruents include Berber (Dell & Elmedlaoui 2002), the Salish family (native American Northwest languages; e.g. Bagemihl 1991) and the Mon-Khmer family (Austro-Asiatic; Sloan 1988). Bagemihl (1991:593ff) offers a discussion of the cross-linguistic occurrence of and motivation for syllabic obstruents, concluding that there are none. Further discussion appears in Scheer (2004a:§376).
(7)  sonorant vs. obstruent Coda
   a. closed syllable with a sonorant Coda
   b. closed syllable with an obstruent Coda

That is, sonorants may branch on a neighbouring Nucleus, while obstruents are unable to spread on a nuclear position. The language depicted under (7) instantiates this peculiar ability of sonorants. Hence we face a system where sonorants are the only possible syllabic consonants, where only closed syllables with a sonorant Coda count as heavy for the purpose of stress assignment and, precisely, where post-sonorant consonants are weak, while post-obstruent consonants are strong.

Indeed when sonorants branch on the following Nucleus, the Coda Mirror predicts exactly the pattern that we try to understand, and it does so without any extra provision. This was first recognised by Pöchtrager (2001:64) in a study of Finnish consonant gradation: since the vowel following the post-Coda consonant has no governing duties to observe in case the preceding Nucleus is occupied by the branching sonorant, it will direct its Government to its own Onset, which therefore is both governed and licensed. In this configuration, thus, the post-sonorant consonant ought to show intervocalic behaviour (recall that intervocalic consonants are both governed and licensed), which indeed it does: the Korean facts discussed in chapter XXX (Ségéral & Scheer) show that when post-sonorant consonants are weak they follow their intervocalic peers, rather than Codas. On the other hand, obstruents cannot branch, which means that in all languages V₂ in V₁TₒCV₂ must govern the preceding empty Nucleus and therefore makes the post-Coda consonant un governed but licensed, hence strong.

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This follows from the fact that the stress algorithm counts segmentally expressed Nuclei: long vowels and closed syllable with a sonorant Coda occupy two Nuclei, while open syllables and closed syllables with an obstruent Coda only instantiate one Nucleus. Szigetvári & Scheer (2005:65ff) offer a more detailed demonstration.
Finally, in languages where sonorants cannot branch, no syllabic consonants are encountered, sonant Codas do not behave any different from obstruent Codas for the purpose of stress assignment and all post-Coda consonants, whether following a sonant or an obstruent, are strong. Hence like under (6), it follows that there are three empirical consequences of just one parametric choice, a reunion that makes precise predictions which are easily falsifiable. Space restrictions prevent us from running them against some empirical record.

Note that the variable status of sonorants regarding their branching ability, as opposed to uniformly disabled obstruents, encodes a generalisation that appears to be stable for all phenomena examined: sonorants may be syllabic or not (while obstruents never are), sonorants may or may not count for stress assignment (whereas obstruents never do without sonorants), and post-sonorant consonants may or may not be weak (while post-obstruent consonants never are).

We therefore believe that phonological theory must be able to derive this variation from just one parametric choice: all syllable-related effects of consonantal sonority that are subject to parametric variation have the same source. It appears that the three phenomena implying the variable behaviour of sonorants has not been considered as an interrelated whole in the past. We submit that the parameter on the branching ability of sonorants is the key not only to the allegedly melodic influence on lenition, but to the entire puzzle.18

5. Stress-related lenition

[we haven't had a chance to see Paul de Lacy & Patrick Bye's paper on stress yet, so this section is tentative and subject to revision]

Chapter XXX (Lacy & Bye) provides an overview of stress-related factors in lenition and fortition. The general pattern is that stress protects against damage (its host as well as its environment). Why is this so? In the present

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18 Sonorants may also branch to their left. Scheer (2004a: § 591, 2006, in press) argues that the contrast left- vs. right-branching differentiates between syllabic (left-branching) and so-called trapped consonants (right-branching): compare Czech trvat (syllabic r) "to last" with Polish trwać "id." (trapped r). The ability of sonorants to branch to either side, then, is controlled independently from their ability to branch at all. A more complete picture of the relevant empirical correlates is drawn in the literature quoted.
section we provide a tentative answer that follows the "materialistic" strategy of Direct Interface: stress is an immaterial suprasegmental property of sound that is usually referred to with a diacritic (such as an acute accent on a vowel). The affinity between low tone and voicing, between high tone and voicelessness is by now obvious (from tonogenesis) and undisputed.

Nothing of the kind is reported for stress: unlike other suprasegmentals such as tone, it does not appear to interact with melodic primes.\(^{19}\) We therefore explore the hypothesis that stress materializes in syllabic form, i.e. as a CV unit. Stress inserts syllabic space, something that introduces a kind of demarcation line in the middle of a segmentally contentful string. The notion of demarcative stress is familiar from the structuralist literature, and the idea that stress provides syllabic space is not any more original: it has been proposed by, among others, Nespor & Vogel (1979) and Piggott (2003:414ss) namely for Italian (Tonic Lengthening and Radoppiamento Sintattico). The implementation of this line of thought into CVCV in form of a CV unit is due to Larsen (1998).

Let us consider just one argument that lends support to the idea that stress identifies as an empty CV unit: the disjunction "word-initially and in tonic environments". The same segmental effect is indeed recurrently observed in these two contexts, which do not seem to share any property at first sight. The list of processes that take place in this disjunction includes the following items (Scheer 2000a:140ss introduces relevant data with greater care).

A first case in point is aspiration in English. Aspirated voiceless stops occur in the Onset of tonic syllables as well as word-initially regardless of the position of stress: \(\text{p}^\text{bólítics}\) vs. \(\text{p}^\text{bólítbícian}\) (e.g. Iverson & Salmons 1995).

Second, consider the distribution of \(h\) in Dutch. In this language \(h\) occurs only word-initially (\(\text{hoed} [\text{hut}] \text{"hat")}\) and before stressed vowels (\(\text{Jo} \text{hannes} [\text{jóhânəs}] \text{"first name")}\). Elsewhere a glide (copied from the preceding vowel) appears in its place (at least in Eastern varieties: \(\text{Johan} [\text{jówan}] \text{"first name")}\) (e.g. Gussenhoven & Jacobs 1998:230). The same distribution is actually known from English: other than the regular initial occurrence,

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\(^{19}\) Although it may be attracted by sonority-defined natural classes of vowels (de Lacy 2002). What we mean is that it has no melodic identity. Also, there is nothing like a tone-assigning algorithm that counts objects in order to find its locus of expression.
compare vé[ø]icle vs. ve[h]icular, pro[ø]ibition vs. pro[h]ibit (e.g. Harris 1997:320).

The disjunction at hand is also illustrated by the distribution of the glottal stop in German, which on one hand is obligatorily inserted at the beginning of vowel-initial words: Auto [ʔawtoo] "car", essen [ʔesən] "to eat" etc. On the other hand, it also breaks up vowels in hiatus in case stress falls on the second item: Chá[ø]s vs. cha[ʔ]ótisch "chaos, chaotic", The[ʔ]ter vs. the[ø]atrálisch "theatre, theatrical" etc. (e.g. Alber 2001).

Another illustration comes from Verner's Law, which controls the voicing of Common Germanic fricatives (i.e. the outputs f,P,h of Grimm's Law from IE *p,t,k plus unshifted original *IE s). Traditional descriptions most of the time only state that the original voiceless items become voiced in Common Germanic if IE stress (visible only in the Indian branch) did not fall on the preceding vowel. They usually do not mention the word-initial situation (something that Collinge 1985:205 correctly points out; he also provides exhaustive literature regarding the Law): word stress can hardly fall on the vowel preceding the first consonant of a word, so we would expect initial fricatives to undergo voicing. In fact they do not: all word-initial Germanic fricatives are voiceless. The correct statement for the complete distribution of Common Germanic fricatives is thus "voiceless fricatives word-initially and after originally stressed vowels, voiced fricatives elsewhere". This leaves us with a classical diachronic lenition process whereby a general lenition has affected all target items (fricatives), except when they were protected by their positional strength.20

Finally, a vocalic version illustrating the disjunction at hand is taught in all textbooks of French diachronics: in the evolution from Latin to French, "vowels occurring in the initial syllable […], together with tonic vowels, are the only ones that systematically appear in French" (Bourciez & Bourciez 1926:101). All other vowels are either completely lost or reduced

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20 Since post-Coda consonants are also strong, fricatives in this position are expected to escape voicing as well. This prediction may not be tested since we know from Grimm's Law that Common Germanic distinguishes between the post-sonorant and the post-obstruent position (see section 4.2 of chapter XXX Ségéral & Scheer): the former is weak (Grimm's Law applies: compare Lat. uereto with Goth wairPan "to become"), while the latter is strong (Grimm's Law is inhibited: compare Lat. captus, noctis with Old High German haft, naht "captiveness, night"). Therefore, fricatives originating in Grimm's Law did not occur after obstruents in Common Germanic; IE *s did not either.
to schwa: some illustration may be provided by the words dormitóriu > dortoir, *fenícule > fenouil vs. liberáre > livrer, lépore > lièvre.

Hence the disjunction under study does not seem to be anecdotal: it governs lenition-sensitive consonantal as well as vocalic phenomena in a variety of languages. We are therefore inclined to accept it as a good diagnostic when it comes to identify the phonological identity of stress. The advantage of a disjunction is the same here as elsewhere: if you have an idea of what one half looks like, you may conclude on the identity of the other half. The Coda Mirror therefore allows for only one conclusion: the word-initial location is strong (in those languages where it is) because the word is preceded by an initial CV; hence stress also materialises as an empty CV unit.

Under this hypothesis, the strength of consonants in tonic environments follows. In order to see that, let us first factor out what the cover term "tonic environment" actually means in CVCV: it recovers two situations since nothing a priori indicates whether the stress-CV is inserted before or after the tonic vowel.

\[
\begin{align*}
(8) \quad \text{linearization of stress} \\
\text{a. before the tonic vowel} & \quad \text{b. after the tonic vowel} \\
\begin{array}{c}
\text{Gvt} \\
\downarrow \\
\text{tonic} \\
\text{Gvt}
\end{array} & \quad \begin{array}{c}
\text{tonic} \\
\uparrow \\
\text{Gvt} \\
\downarrow
\end{array} \\
\begin{array}{c}
\text{V C V C V} \\
\uparrow \\
\text{V C V C V}
\end{array} & \quad \begin{array}{c}
\text{C V C V C V} \\
\uparrow \\
\text{C V C V C V}
\end{array}
\end{align*}
\]

In any event, the empty Nucleus of the stress-CV must be governed. Therefore, the consonant following the location of its insertion is strong: its Nucleus is called to do the job. Translated back into surface terms, this means that we predict two empirical situations: one where the consonant preceding the tonic vowel is strong, and another where the consonant following the tonic vowel stands in a strong position. As we have observed earlier, languages indeed seem to display both patterns: Dutch h, the German glottal stop and English aspiration occur before the tonic vowel, while Common Germanic fricatives are strong when they come to stand after the tonic vowel.
The next question concerns the modified overall picture that emerges: in fact there are not two, but three strong positions, at least in some languages: the Coda Mirror \(#,\#C\) plus the tonic environment. We thus expect cases where strong position effects are observed word-initially, after Codas and in tonic environments. Even though we have not come across any phenomenon of this kind, the prediction indeed holds and we foresee that this pattern is active somewhere out there. Also, recall that post-Coda consonants (sometimes only post-obstruent consonants) ought to be strong in all languages, while the strength of word-initial consonants is parameterised. Hence the disjunction "word-initially and in tonic environments" could only occur in \#TR-only languages, i.e. where the initial site is special. This is true for all cases mentioned. In the other type of language, however, where the word-initial phonology is not any different from domestic morpheme-internal phonology (hence in anything-goes languages), the disjunction at hand could not possibly exist. On the other hand, another type of stress-relevant disjunction should be found: "after a Coda (an obstruent) and in tonic environments". We also take this to be a relevant prediction that needs to be confronted to the empirical record of anything-goes languages.

Finally, the following question needs to be raised: anytime we encounter the disjunction "word-initially and in tonic environments", how come that the effect is not observed after Codas (after obstruents), i.e. in the only position that is strong in all languages? In all cases quoted but one, the answer is straightforward: accident. Or rather, the target item of the process at hand does simply not occur after Codas. This is the case for Verner's Law (there are no fricatives after obstruents, cf. note 20), Dutch (and English) h and the German glottal stop. In the latter case where the target item is not underlying but epenthetic, there is an overt reason why it is not epenthized after Codas: the following Onset is not empty. Or, in other words, glottal stop insertion targets all empty Onsets in strong position. Post-Coda Onsets are strong but never empty, hence there is no effect visible: one case where the target items do occur in post-Coda position but do not show any effect is English aspiration: why does the t in *party, guilty* or *captive* remain unaspirated? If we are on the right track, there must be something that makes the post-Coda position different from the word-initial and the pre-tonic position. This is indeed the case: consonants in all three positions are preceded by an empty Nucleus – but only in the latter two positions is this empty Nucleus also preceded by an empty Onset: the Onset of the empty Nucleus that separates a Coda-Onset cluster is filled by the
Coda consonant. Hence the overall distribution of aspiration is "in strong position iff the preceding Onset is empty": aspiration needs the presence of an additional consonantal slot. The obvious conclusion, then, is that English aspirated voiceless stops in fact are geminates – they cannot occur after Codas because there is no skeletal slot on which they could branch. Or, in other words, that geminates in English "have chosen" not to transmit their identity as such in form of the usual length, but as some other kind of phonetic exponent, aspiration. Note that there are no phonetic geminates in English, which means that the systemic slot is orphan. Given basic autosegmental principles and a non-one-to-one relationship between phonetics and phonology, there is no surprise to see that a given phonological object may signal its presence through variable cues. The effect that object X appears in an "unexpected" phonetic coat has been demonstrated especially for long vowels (Lowenstamm 1991, Bendjaballah 1999, Rizzolo 2002) and geminates (which are then called virtual geminates, see Ségréral & Scheer 2001c).

We are aware of the fact that our hypothesis regarding the syllabic identity of stress is based on a very limited empirical window and hence tentative. It needs to be run against a broader pool of data, both regarding lenition and other phenomena. We wish to point out, however, that the incarnation of stress as syllabic space that needs to be linearized in the segmental string is an element of a broader research programme that aims at doing away with arboreal structure in phonology. Beyond the empirical issue, the most important contrast between our approach and the classical representation of stress is the following. At least since Liberman & Prince (1977), Selkirk (1981) [1978], stress is represented either by arboreal structure in the form of s/w-labelled trees or feet, or by metrical grids (Prince 1983), another type of units above the skeleton that are not genuinely phonological. By contrast, stress in form of a CV unit makes no use of supra-skeletal hierarchical structure; instead it linearizes a truly phonological object, thereby satisfying the requirements of Direct Interface (only truly phonological objects may influence the course of phonology) and making another piece of arboreal structure superfluous.  

Conceiving of hierarchical relationships in terms of lateral forces (Government and Licensing) rather than arboreal structure produces benefits at

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21 Szigetvári & Scheer (2005) show the advantages of a CVCV-based stress assigning algorithm that works without any reference to arboreal structure.
the syllabic level (the Coda Mirror as shown, see also the CVCV literature quoted). More important issues regarding the general architecture of grammar, however, are the ensuing advantages of Direct Interface as described in section 3.2 and the fact that there could be no recursion without arboreal structure – a desirable result since it has long been recognized that unlike in syntax and morphology, the assembling devices, there is no recursion in phonology or semantics (e.g. Chomsky et al. 2002). In other words, phonological theory must not be able to generate recursion. While in a system with arboreal structure recursion is a valid option, it is excluded when trees are absent in the first place: recursion requires dominance (Neeleman & Koot in press, Scheer 2004a:§2).

6. Conclusion

Lenition and fortition seem to be conditioned by three factors: the position of the target segment in the linear string (chapter XXX Ségéral & Scheer), stress (chapter XXX de Lacy & Bye) and the fact of sharing (some of) its melodic primes with other skeletal slots (chapter XXX Honeybone sharing). It appears that there is a natural order in which these factors need to be taken care of: positional factors are fundamental since there does not seem to be any lenition that ignores them. Also, segments that share melodic primes with a foreign skeletal slot are always strong. By contrast, the impact of stress is optional: it may or may not play a role. We therefore believe that an adequate theory of lenition must be grounded on a theory of positional, i.e. of syllabic influence, as well as on the "sharing-makes-us-stronger" phenomenon, as Honeybone (2004) puts it.22

The latter factor does not seem to require any specific theory. It is but an effect of a much broader "natural" phenomenon in the particular field of lenition: segments or melodic primes that are anchored in more than one skeletal slot are more solid and less subject to alternation (the best known aspect of this is so-called geminate inalterability). An adequate theory of this phenomenon in itself will automatically get its effect on lenition right.

22 John Harris' (1994, 1997) Licensing Inheritance is an example of a stress-based theory. Discussion of the consequences thereof, i.e. the inability to express the Coda Mirror disjunction in stress-insensitive systems, is provided in Scheer (2004a:§195).
We therefore do not believe that any particular action needs to be taken by a theory of lenition in order to address the sharing issue.

Stress, the optional conditioning factor, was absent from Coda Mirror theory in its previous version – we have developed a specific view of its identity and action that fits the Coda Mirror and Direct Interface. We are aware of the fact that the empirical window on which this approach relies is very scarce, and that there are certainly many stress-related lenition phenomena out there that cannot be straightforwardly accounted for by our analysis. However, we believe that the idea of stress materializing as syllabic space is promising and may be a good guide into the jungle of stress-related lenition.

Finally, the core of the foregoing pages has been devoted to the implementation of the two binary parameters that seem to marshal the variation found in lenition patterns cross-linguistically, and which have been evidenced in chapter XXX (Ségéral & Scheer): the status of the beginning of the word which may or may not induce strength, and the status of sonorants which may or may not make the following consonant weak. These developments as well as the analysis of stress are guided by a global view on how phonology processes extra-phonological information, which was not present in earlier versions of the Coda Mirror: Direct Interface allows only truly phonological objects to play a role in phonology. The initial CV and its parameterisation are an illustration thereof, and so is our interpretation of stress.

The main result of this view on the parametric variation is the connection of lenition with other phenomena that, under alternative analyses, remain entirely unrelated. We wish to call attention on the fact that it is only 1) the representational character of the parameter-implementation and 2) their binary (not n-ary) variation that make precise, non-trivial and easily falsifiable predictions. For one thing (see (6)), languages where initial consonants are weak will also be able to have alternating first vowels and to display non-#TR clusters word-initially (while languages with strong initial consonants are supposed to have stable first vowels are to be #TR-only). On the other hand, in languages where post-sonorant consonants are weak, trapped consonants are possible23, and stress assignment may be sensitive to Coda sonority (while in languages where post-sonorant consonants are strong, trapped consonants ought not to occur, and stress cannot be sensitive Coda sonority).

23 See note 18 on the difference between syllabic and trapped consonants.
Also, what appeared as a major challenge for any theory of lenition has been turned into a regular instantiation of a binary parametric choice: the very definition of lenition as a positional phenomenon excludes any melodic influence; however, sonorant Codas obviously do impact lenition in many languages. It is only when the influence of sonority is understood as an effect of branching, rather than of an exchange of melodic primes among neighbours, that lenition recovers its full autonomy as a process which does not overlap with assimilation. The perspective of representing sonority as a non-melodic property (hence fundamentally different from labiality, stopness and the like) actually unifies its behaviour in stress systems and in lenition – an encouraging result. Finally, this approach to sonority predicts that in case post-sonorant consonants are non-strong they behave like their intervocalic peers, rather than like Coda consonants. This prediction is not trivial and seems to be borne out by the languages that we have been able to review.

All in all, this paper has further developed the Coda Mirror so that it now offers a complete theory of lenition and fortition where all relevant factors are represented. True, the implementation of stress will surely need to be refined, but it seems to us that positional factors, stable as well as cross-linguistically variable, are well covered. We know of course that our window on the empirical situation projects an incomplete picture. This notwithstanding, we hope that the major parametric choices have by now emerged and will remain stable.
References

References followed by ROA can be downloaded at http://roa.rutgers.edu/index.php3
SZIG can be downloaded at http://seas3.elte.hu/szigetva/papers.html
TOB can be downloaded at http://www.unice.fr/dsl/tobias.htm

Alber, Birgit

Bagemihl, Bruce

Beckman, Jill

Bendjaballah, Sabrina
1999 Trois figures de la structure interne des gabarits, Ph.D dissertation, Université Paris 7.

Blaho, Sylvia
2001 The representation of Slovak syllabic consonants in strict CV. The Odd Yearbook 6: 3-24.

Blevins, Juliette

Bourciez, Edouard, and J. Bourciez
1967 Phonétique française. 9e édition Paris: Klincksieck.

Chomsky, Noam, Marc Hauser, and Tecumseh Fitch
2002 The faculty of language: what is it, who has it, and how did it evolve? Science 298: 1569-1579.

Collinge, N. E.

Csides, Csaba
<table>
<thead>
<tr>
<th>Year</th>
<th>Author(s)</th>
<th>Title and Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003a</td>
<td>Cyran, Eugeniusz</td>
<td><em>Complexity Scales and Licensing Strength in Phonology</em>. Lublin: KUL.</td>
</tr>
<tr>
<td>1992</td>
<td>Hall, Tracy</td>
<td><em>Syllable Structure and Syllable-Related Processes in German</em>. Tübingen: Niemeyer.</td>
</tr>
<tr>
<td>1990</td>
<td>Harris, John</td>
<td>Segmental complexity and phonological government. <em>Phonology</em> 7: 255–300. TOB.</td>
</tr>
<tr>
<td>1997</td>
<td>Hayes, Bruce, Robert Kirchner, and Donca Steriade (Eds)</td>
<td>Licensing Inheritance: an integrated theory of neutralisation. <em>Phonology</em> 14: 315-370. TOB.</td>
</tr>
</tbody>
</table>
Iverson, Gregory, and Joseph Salmons

Kaye, Jonathan

Kaye, Jonathan, Jean Lowenstamm, and Jean-Roger Vergnaud

Kijak, Artur

Kiparsky, Paul

Kirchner, Robert

Larsen, Bergeton Uffe

Liberman, Mark, and Alan Prince

Lowenstamm, Jean


Neeleman, Ad, and Hans van de Koot
in press On syntactic and phonological representations.

Nespòr, Marina, and Irene Vogel

Pagliano, Claudine
2003 L'épenthèse consonantique en français. Ce que la syntaxe, la sémantique et la morphologie peuvent faire à la phonologie. Ph.D dissertation, Université de Nice. TOB.

Piggott, Glyne

Pöchtrager, Markus

Prince, Alan

Rizzolo, Olivier
2002 Du leurre phonétique des voyelles moyennes en français et du divorce entre Licensciement et Licensciement pour gouverner. Ph.D dissertation, Université de Nice. TOB.

Rowicka, Grażyna

Scheer, Tobias
2000a De la Localité, de la Morphologie et de la Phonologie. Habilitation thesis, University of Nice. TOB.
2000b Why Moroccan Arabic tolerates anything word-initially, but Slavic does not. Paper presented at *the 8th Manchester Phonology Meeting*, Manchester. TOB.
2004b How minimal is phonological change? *Folia Linguística Historica* 25: 69-114. TOB.
2005a We need a translator's office, but the buffer has to go: Direct Interface. Paper presented at the 36th Poznań Linguistic Meeting, Poznań. TOB.

2005b When higher modules talk to phonology, they talk to empty Nuclei. Paper presented at the conference Sounds of Silence, Tilburg. TOB.

2006 What happens when sonorants branch on Nuclei. Paper presented at the Third Old World Conference in Phonology, Budapest. TOB.


in press Syllabic and trapped consonants in (Western) Slavic: different but still the same. In Investigations into Formal Slavic Linguistics, Gerhild Zybatow and Luka Szucsich (eds.). Frankfurt am Main: Lang. TOB.

Ségéral, Philippe, and Tobias Scheer

1999 The Coda Mirror. Ms, slightly less evolved English version of Ségéral & Scheer 2001. TOB.


2001b Les séquences consonne + yod en gallo-roman. Recherches Linguistiques de Vincennes 30: 87-120. TOB.


Seigneur-Froli, Delphine


Selkirk, Elisabeth

Sloan, Kelly

Smith, Jennifer

Steriade, Donca
1997 Phonetics in Phonology: The case of Laryngeal Neutralization. Ms, University of California, Los Angeles.

Szigetvári, Péter

Szigetvári, Péter, and Tobias Scheer

Vijayakrishnan, K.G

Wiese, Richard

Wilson, Stephen

Zec, Draga

Zoll, Cheryl
ms Positional Asymmetries and Licensing. MIT. ROA #282.