Chapter X
Positional factors in Lenition and Fortition

1. Introduction

This chapter sets out to identify the bearing that the linear position of a segment may have on its lenition or fortition.¹ We take for granted the definition of lenition that has been provided in chapter XXX (Szigetvári): Putting aside stress-related lenition (see chapter XXX de Lacy-Bye), the reference to the position of a segment in the linear string is another way of identifying syllabic causality. Something is a lenition iff the effect observed is triggered by the specific syllabic status of the segment at hand. The melodic environment thus is irrelevant, and no melodic prime is transmitted between segments. Lenition thereby contrasts with the other family of processes that is found in phonology, i.e. adjacency effects. Adjacency may be defined physically (e.g. palatalisation of a consonant by a following vowel) or in more abstract terms (e.g. vowel harmony): in any event, assimilations will transmit a melodic prime from one segment to another, and only a melodically defined subset of items will qualify as a trigger. Positional factors, on the other hand, are unheard of in assimilatory processes: there is no palatalisation that demands, say, "palatalise velars before front vowels, but only in word-initial position".

Based on an empirical record that we have tried to make as cross-linguistically relevant as possible, the purpose of this chapter is to establish appropriate empirical generalisations. These are then designed to serve as the input to theories of lenition: here are the challenges, this is what any theory needs to be able to explain.

The chapter divides into two main parts: we first describe the basic regularity, i.e. what appears to be cross-linguistically stable. The relevant patterns here fall into three categories: the Strong Position \{#,C\} ("word-initially and after a heterosyllabic consonant"), the Coda \(#,C\) ("word-

¹ For expository reasons, we only talk of "lenition" when we actually mean "lenition and fortition" in the remainder of this chapter.
finally and before a heterosyllabic consonant") and the intervocalic position V__V. The two latter are weak and hence favour lenition, while the former, as indicated by its name, shields against lenition and favours fortition.

The second part is concerned with parametric choices that individual languages can make within this general frame. They appear to be of two kinds: the margins of morphemes (or words) may or may not participate in the phenomenology. That is, an effect may be encountered only in "half of the Coda", or only in "half of the Strong Position". In this case, however, the choice is not arbitrary: no variation is encountered morpheme-internally (all post-Coda consonants are strong, all internal Codas are weak), while the left and the right margin may or may not follow the internal pattern. That is, word-initial consonants may (e.g. French) or may not (e.g. Greek) be strong, and word-final consonants may (e.g. l-vocalisation in Brazilian Portuguese) or may not (e.g. l-vocalisation in French) be weak. Cases where consonants are strong word-initially but not after Codas, or where final Codas are weak but not their internal peers, do not appear to exist.2

The second parametric variation that we describe is something which should not exist according to the definition of lenition that was introduced above. That is, the melodic properties of adjacent segments may influence the strength of consonants – or rather, one specific property: sonority; and in one specific context: the post-Coda position. That is, post-Coda consonants in some languages are always strong no matter what (e.g. French), while they are only strong after obstruents in others. In the latter type of language (e.g. Greek), they indeed go along with weak intervocalic consonants if the preceding Coda is a sonorant.

Finally, the reader should be aware of the fact that we only present selected data sets which we believe are typical representatives of the pattern at stake. Each situation presented is substantiated by more evidence (which we merely refer to as much as we can) and actually represents the result of what we hold to be cross-linguistically relevant. At the risk of being cor-

2 Please note that we use the familiar syllabic vocabulary in a purely descriptive fashion that does not imply any theoretical or representational engagement: the lingua franca term "Coda" in our text for example refers to word-final consonants (final Coda) and to those that occur before a heterosyllabic consonant (internal Coda). A "branching Onset", along the same lines, is a cluster of rising sonority, typically obstruent-liquid, to which phonologists traditionally assign a homosyllabic status. Also, a "Coda cluster" is a sequence of consonants with a falling or a constant sonority slope (Coda-Onset). Finally, "T" in this chapter is shorthand for "any obstruent", and "R", for any sonorant.
rected by evidence that is out there and which we ignore, we ambition to
provide an overview of what is going on in natural language – actually
what can, and what could not be found. In sum, thus, we aim at identifying
the challenges that the empirical situation raises for any theory of lenition
and fortition: this is what you need to be able to account for, while that is
what you must not be able to do.

2. The basic pattern: strong vs. weak positions
2.1. The five basic positions and their clustering into three major groups

Consonants may occur in five different positions of the linear string: 1)
word-initially ___, 2) after a Coda C.__, 3) intervocally V__V, 4) be-
fore a heterosyllabic consonant __.C and 5) word-finally __#.

These exhaust the logically possible positions as long as branching On-
sets, i.e. typically muta cum liquida, are lain aside. Of course lenition may
also affect members of branching Onsets – but it is a good deal less com-
mon here. The evidence that we are aware of is scarce for a reason that
seems obvious: typologically speaking, branching Onsets are the most "ex-
reme" (or most marked) syllabic configuration that is available in natural
language. Indeed, many (most) languages do not tolerate any cluster. If
adjacent consonants are admitted, they will be either restricted to Coda-
Onset sequences, or they may have both a raising and a falling sonority
slope. Systems with branching Onsets but without Coda clusters do not
appear to exist.3 Hence branching Onsets imply the existence of Coda clus-
ters, while the reverse is wrong.

The bare material regarding branching Onsets that natural language pro-
vides is thus limited by definition. Our position in this chapter is thus one
of caution: due to the typological situation and our own ignorance of a suf-
ciently bold record, we refrain from making any firm assertion. We will,
however, share a case that we know with the audience, that is the evolution
of Latin TR clusters in French (section 2.7).

Given these provisions, consider under (1) how the five basic positions
coagulate in a great many languages.

3 Common Slavic is the one alleged counter-example that is known in the litera-
ture.
the five basic positions and their grouping

<table>
<thead>
<tr>
<th>position</th>
<th>usual name</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a. #_V</td>
<td>word-initial</td>
<td></td>
</tr>
<tr>
<td>b. VC._V</td>
<td>post-Coda</td>
<td>Strong Position</td>
</tr>
<tr>
<td>c. V__CV</td>
<td>internal Coda</td>
<td>Coda</td>
</tr>
<tr>
<td>d. V__#</td>
<td>final Coda</td>
<td>Weak Positions</td>
</tr>
<tr>
<td>e. V__V</td>
<td>intervocalic</td>
<td></td>
</tr>
</tbody>
</table>

Positions have been arranged according to their effect. It does not really take long to convince phonologists that the generalisation regarding the Coda disjunction __{#,C} is real. This is due to the prominent role that this disjunctive context has played in the late 70s: it was one of the major arguments that grounded the autosegmental idea, (re-)introducing syllable structure into the hitherto linear SPE model. Coda effects are very frequent, and everybody knows that they typically provoke the lenition of the Coda consonant at hand: all textbooks present relevant evidence (e.g. Harris 1994:66ss, Blevins 1995:227ss).

On the other hand, (1) identifies the exact mirror context, i.e. "after a heterosyllabic consonant and word-initially" {C,#} as the "Strong Position". This is how the disjunction at hand is called in the Romanicist literature since the 19th century (among many others Bourciez & Bourciez 1967:122) on account of its effect, which is also opposite in regard of the Coda: consonants in this position are shielded against lenition, and in some cases undergo fortition.

The constitution of (1)a and (1)b as a disjunctive context whose members share a common fate is much less well established in the literature. We have collected relevant synchronic and diachronic evidence from genetically unrelated languages elsewhere (Ségéral & Scheer 2001a) in order to support the reality of this disjunction. One chosen data set will be presented below.

Finally, consonants in intervocalic position are certainly prone to damage and therefore must be said to occur in a weak position. However, the effects they show are different in kind from those that are observed in the other weak position, the Coda. Some illustration of this fact will be provided in the following section.

The overall picture thus divides the five basic positions into three blocs, two of which are disjunctions: The disjunctive Strong Position is opposed
to weak positions, which fall into the (disjunctive) Coda and the intervocalic context.

2.2. The Strong Position: evolution of Latin obstruents in French

The evolution of Latin obstruents in French is particularly suited to accompany the foregoing discussion since it illustrates all divisions mentioned. Relevant evidence appears under (2) below.4

(2)  
a. #   b. post-Coda

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>p</td>
<td>porte</td>
<td>talpa</td>
<td>taupe</td>
</tr>
<tr>
<td>b</td>
<td>bien</td>
<td>herba</td>
<td>herbe</td>
</tr>
<tr>
<td>t</td>
<td>toile</td>
<td>cantare</td>
<td>chanter</td>
</tr>
<tr>
<td>d</td>
<td>dent</td>
<td>ardere</td>
<td>ardeur</td>
</tr>
<tr>
<td>k</td>
<td>cœur</td>
<td>rancore</td>
<td>ranceur</td>
</tr>
<tr>
<td>g</td>
<td>gueule</td>
<td>angustia</td>
<td>angoisse</td>
</tr>
<tr>
<td>f</td>
<td>faim</td>
<td>infernum</td>
<td>enfer</td>
</tr>
<tr>
<td>s</td>
<td>serpent</td>
<td>versare</td>
<td>verser</td>
</tr>
</tbody>
</table>

4 Please note that for the sake of space restrictions the data presented, as well as the discussion below, are a digest version of a more intricate philological situation that is introduced with greater care in Ségéral & Scheer (2001a) and Scheer (2004a:§117). Namely the conservation of certain bilabial plosives in Coda position under the form of [f] (*cap(u) > chef, tra(be) OFr. tref / tre), the regular continuation of velar stops as yod in certain environments as well as the existence of palatalisations in Strong Position would require further explanation. Vowels that are lost at some (early) stage of the evolution appear in brackets, those that bear stress are underscored, and vowel length is not indicated. In each column, the Latin forms precede their French cognates.

Glosses for table (2): a) door, well, canvas, tooth, heart, face, hunger, snake; b) mole, grass, to sing, ardour, rancour, fear, hell, to pour; c) _C road, elbow, plane (tree, dialectal), future, done, rigid, Stephen, flee; c) _# wolf, where, husband, naked, true, we; d) shore, broad bean, life, tail, lettuce, August, outside, thing.
Let us first consider the behaviour of obstruents in intervocalic position as under (2)d. All of them undergo lenition. That is, labial stops spirantise, dental and velar stops as well as [f] disappear altogether, and [s] voices.

In contexts under (2)c, i.e. before a (heterosyllabic) consonant and word-finally, Latin obstruents are lost. The identical behaviour of consonants in this disjunctive context \{C,#\} reflects their common syllabic status: they occur in Codas.

Hence the fate of Latin obstruents in intervocalic position and in Codas is different. Even though [t,d] for example are lost in both environments, voicing (Latin s) and spirantisation (Latin labials) are observed in intervocalic position, while no such process occurs in Codas. This notwithstanding, both intervocalic and Coda contexts produce damage on consonants.

Let us now turn to obstruents that occur word-initially (2)a and after Codas (2)b. The first thing to observe is that all consonants behave in exactly the same way in both environments: a given input produces exactly the same result both word-initially and in post-consonantal position. The disjunctive context \{C,#\} that emerges is the Strong Position.

The second relevant observation is that consonants in Strong Position remain stable in the evolution from Latin to French. Thus the Strong Position maximally contrasts with the Coda and the intervocalic position.

In sum, thus, damage or preservation of Latin obstruents depends on the position in which they occur, and the five basic situations cluster as shown under (1).

2.3. Two ways of being weak

Regarding weak positions, the evolution of Latin obstruents also demonstrates that the effect of Codas and the intervocalic position may occasion-
ally coincide, but does not need to. Therefore two weak positions must be distinguished.

This is also evident when we consider the kind of damage that is observed in both environments: the type of lenition that occurs in Codas is usually not found intervocally, and vice-versa (see chapter XXX (Szigetvári), Szigetvári 1999, Ségeral & Scheer 1999a, Scheer 2004a:§131). Devoicing for example typically occurs in Codas, but is never observed intervocally. Other Coda-specific lenitions are deaspiration, velarisation (l,n → l,ŋ), s-debuccalisation (s → h), liquid gliding (r,l → j), depalatalisation (ŋ → n), l-vocalisation (l → w), r-vocalisation or loss (of the English or German kind: r/ʁ → ɐ) and the homorganisation of nasals.

On the other hand, rhotacism is a lenition that appears to occur only in intervocalic position. Spirantisation also seems to be a typical intervocalic event, but it may also occur in Codas (the well known Tiberian Hebrew spirantisation goes into effect in both contexts). However, spirantisation in Codas supposes that intervocalic stops are also affected: cases where stops spirantise in Codas but not intervocally do not appear to be on record. The reverse of course is not true: spirantisation occurs only intervocally in many systems.

The same point can be made when looking at lenition trajectories: Szigetvári shows in chapter XXX (see also Szigetvári 1999, in press, Honeybone 2001:227f, Ségeral & Scheer 1999b) that there are two major paths on which strong segments can engage when experiencing damage: one is bound to the intervocalic position, while the other is observed in Codas. There are two ways of being weak.

2.4. Cross-linguistic relevance of the Strong Position

As was mentioned earlier, the fact that the Coda is a position which causes lenition does not require any empirical grounding anymore. Abundant evidence has been produced in traditional philological, neogrammarian, structuralist and generative work. Lenition was actually put into the spotlight in the latter as a by-product of the goal to produce evidence in favour of the Coda disjunction in the late 70s and early 80s: lenition is the typical kind of segmental effect that the Coda produces.

The same holds true for the intervocalic situation: its lenition-generating character across languages is undisputed; no specific evidence needs to be produced here either.
The Strong Position, however, has received far less attention from all theoretical quarters. Even though it represents as much a disjunction as the Coda context and hence raises the same challenge for phonological theory (i.e. to be able to address the disjunction as a unique phonological object), only occasional discussion appears in the literature (Kenstowicz & Kisseberth 1977:16, Kenstowicz 1994:35), and the theoretical challenge is never made explicit.5

We have therefore tried to collect as much data as we could where segments share a common fate in the Strong Position. The evidence that has been gathered in Ségéral & Scheer (2001a,b, in press), Scheer (2004a:§§110,556), Szigetvári (1999,in press), Dienes (2000) aims at establishing the cross-linguistic validity of the Strong Position, which is relevant for synchronic alternation as much as in diachronic evolution, and active in languages of various genetic origin such as Romance, Germanic, Greek, Armenian, Semitic, Cushitic and Korean. Particular phenomena that have been shown to make reference to the Strong Position are the evolution of Ibero-Romance sonorants, the distribution of stop-allophones in Somali, Tiberian Hebrew spirantisation, the High German (or 2nd) Consonant Shift (on which more below, also Honeybone 2001,2002:60ff,272ff,2003), Sievers' Law, the evolution of Indo-European yod in Classical Greek, spirantisation in Castilian, so-called betacismo (v > b) and s > ts in Italian dialects (all in Ségéral & Scheer 2001a, see also Scheer 2004a:§§110,556), the evolution of Latin yod in French (Ségéral & Scheer 2001b, on which more in section 3.3), the lenition of plosives in Liverpool English (Honeybone 2001,2002:192ff,2003), the distribution of so-called lax stops in Korean and consonant gradation in Finnish (more on the three latter in section 4.3).

5 In the (more or less) recent (cue- or effort-oriented) OT literature on positional phenomena (see chapter XXX (Beckman), Beckman 1997,1998, Kirchner 1998,2004, Steriade 1997, Zoll ms, Vijayakrishnan 2003), which sometimes even especially focuses on fortition (Smith 2002, 2004), the Strong Position disjunction as a relevant linguistic object remains unmentioned as far as we can see, and the empirical grounds for segmental strength (hence abstracting away from prosodic diagnostics) reduce 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. Also, the Strong Position is entirely absent from Kirchner's (1998:8ff) cross-linguistic survey of positional in- fluence on lenition. The literature at hand thus seems to be simply unaware of the fact that the position after Codas is a strong position.
Our window on the cross-linguistic reality is of course ridiculously narrow. The literature offers only relatively scarce evidence, something that is obviously due to the fact that, contrary to Coda phenomena, phonologists have had no particular reason to watch out for Strong Position effects. On an overall statistic count, these may turn out to be rarer than Coda effects – but we are confident that the above record, which has been established in a relatively short period of time and on the grounds of a limited set of languages, is cross-linguistically relevant. It has the same heuristic status as the Coda disjunction.

2.5. Positional strength is relative, not absolute

Another aspect of positional strength is the fact that it is relative, not absolute. The foregoing discussion may lead to believe that the Strong Position protects consonants against any kind of damage – hence that we do not expect lenition to occur word-initially or after a heterosyllabic consonant. This impression is wrong. The Strong Position does not generate any phonological process – no more than the weak positions. Rather, processes occur independently of any positional criterion; but once they are active, they will be able to affect segments more or less according to the position in which they occur: the output will always be relatively stronger (or equally strong) in the Strong Position than it is in weak positions. In other words, there may well be lenition in strong environments, and fortition in weak contexts. It cannot be predicted whether a given position – strong or weak – will experience lenition (or not), fortition (or not), what kind of lenition or fortition, and how much of it. The only generalisation that we see is relative: for a given input in a given language and regarding a given phenomenon, Strong positions are relatively stronger than weak positions, i.e. they will produce outputs that are at least as strong as those that appear in weak positions.

For example, we do not expect to find a language where the same input experiences lenition in the Strong Position, but remains undamaged (or even strengthens) in one or both of the weak positions. Or where strength-
ening occurs in a weak position, but does not affect the same segments in
the Strong Position (or, worse, where the same segments lenite in Strong
Position).

On the other hand, it is perfectly trivial and unimpressive to observe
lenition across the board, i.e. in all positions, including strong environ-
ments. Many "spontaneous", that is context-free sound shifts illustrate this
pattern.

A case where all targets are damaged, but less so in strong than in weak
positions, is the High German (or 2nd) Consonant Shift. Here voiceless

(where L is a liquid). In both cases, a strong post-Coda consonant seems to fall
prey to its neighbour that sits in a weak Coda.
The former pattern concerns almost exclusively NC clusters where C is voiced.
A typical example is found in the evolution from Middle High German (Mhg.)
to New High German (Nhg.) (e.g. Paul et al. 1989:146): compare Mhg. zimber,
lember, imbe with Nhg. Zimmer, Lämmer, Imme "room, lamb pl, bee" (note
that the geminate value of the double nasals is safe for Mhg, while the modern
standard, unlike many dialects, has evacuated all geminates). The same phe-
nomenon also occurs in Southern Italian dialects (e.g. Calabrese chiummu <
plumbu, quannu < quando, Rohlfs 1966-69: §§253-255), in Gascon (paloumo
"wild pigeon" < palumba), Spanish (paloma < palumba) and Catalan (coloma <
columba, segona < secunda) (all of which are documented by Rohlfs
1935:103).
The latter pattern is illustrated in Latin (Niedermann 1985:§§72f,82f, Palmer
1954:231): -ls- *vel-se > velle "to want", -ln- *tol-no > tollo "to remove, to
take away", -rs- *fer-se > ferre "to carry" (apparent counter-examples such as
pulsus "chased", farsi "to stuff pf 1sg", alnu "alder", ulna "forearm" represent
secondary groups that are born through the loss of an intermediate consonant,
e.g. farsi < *fark-s-i). Somali (Cushitic) may also be quoted (Orwin 1995:19): -
ln- waannu hellay (< hel-n-ay) "we found (it)", -lr- waannu dirray (< dir-n-ay)
"we sent (it)". More of the same is found in Korean (Kang 2000:85): -ln- pur
"fire" plus na- "to happen" comes out as pulla- "detection of (fire)".

Two things need to be pointed out. First, we are obviously facing an assimila-
tion – one that is not exactly what is expected, but an assimilation nonetheless:
the weak Coda rules over the strong post-Coda. In other words, the phenome-
non at hand is not a positional process: its motor is of assimilatory nature. Sec-
ond, the result is always a geminate, i.e. a strong object. For a similar case in
the Gallo-Romance evolution we have proposed a compensatory lengthening
scenario (Ségéral & Scheer 2001b): the Coda consonant drops, the post-Coda
consonant expands on its position, but then – crucially – the melodic primes of
the Coda, which have been dissociated but not lost, dock onto the geminate and
hence produce the impression of a progressive assimilation.
Common Germanic stops \([p,t,k]\) (which appear unchanged in English) have lenited in strong and weak positions alike in the Southern half of present-day Germany ("Standard German" has been recruited among variants of this area). However, more damage is produced intervocalically and in Codas (where fricatives are observed) than in the Strong Position (where affricates occur). Some illustration appears under (4) below, where in each column unshifted English forms are followed by their High German cognates.\(^7\)

(3) High German (2\(^{nd}\)) Consonant Shift

<table>
<thead>
<tr>
<th>a. #</th>
<th>b. post-Coda</th>
<th>c. Coda</th>
<th>d. V...V</th>
</tr>
</thead>
<tbody>
<tr>
<td>p</td>
<td>path</td>
<td>Pfad</td>
<td>carp</td>
</tr>
<tr>
<td>t</td>
<td>ten</td>
<td>zehn</td>
<td>salt</td>
</tr>
<tr>
<td>k</td>
<td>corn</td>
<td>(\text{k\text{\textae}})</td>
<td>thank</td>
</tr>
</tbody>
</table>

The interpretation that we have given above is subject to caution in two respects. First, it has been disputed that affrication is a lenition at all (Foley 1977, Escure 1977). Second, the issue arises whether we face a one- or a two-step process: either there has been spontaneous affrication everywhere, followed by an independent contextual change that took affricates to fricatives in weak positions, or a single event has turned voiceless stops into affricates in strong, but into fricatives in weak positions.

Honeybone (2001:228f) convincingly refutes the doubts that affrication is a lenition: these are based on a phonetic definition of lenition, i.e. "lenition is the loss of perceptual salience", according to which the addition of a fricative component to a stop augments its perceptual salience. On this count, however, regular spirantisation (e.g. p\(\rightarrow\)f) is no lenition either, a position that surely nobody will want to entertain seriously.

The second objection is more serious, since the point that we want to make here – lenition in strong position, but less than in weak positions – is

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\(^7\) See chapter XXX (Holsinger) for further discussion. Note that the velar affricate \(\text{k\textae}\) has survived only in High Alemannic (elsewhere \(\text{k}\) was restored), and that there are no examples for internal Codas since all inputs in this context have been previously eliminated by Grimm’s Law. Again, we cannot present full philological and diachronic detail of the process at hand in the frame of this chapter. The phenomenon is well known, and the literature abundant since Braune (1874). Davis & Iverson (1995), Davis et al. (1999) and Honeybone (2002:60ff, 272ff, 2003, 2004) have recently looked at the 2\(^{nd}\) Shift from the point of view of lenition, the latter especially inquiring on the environments and causes for total blocking (stops remain unshifted in homorganic contexts).
fictitious if affrication has applied across the board: on the two-step analysis there is no differential in lenition promotion according to strong vs. weak contexts. Our argument thus supposes the one-step perspective. The literature generally favours the two-step analysis, although the one-step scenario has also been advocated.\(^8\) Scheer (2004b, also 2004a:§572) reviews the evidence in detail, concluding that no compelling argument has been produced in favour of the two-step perspective, nor in disfavour of the one-step analysis.

On the other hand, he observes that both scenarios make a different prediction for weak positions: there must have been affricates if affrication has first applied across the board, while the one-step analysis holds that affricates have never existed in weak positions. Now the dialectal record is without any ambiguity: despite meticulous scrutiny, the existence of a great amount of dialectal variation and a relatively vast territory, dialectologists could not find the slightest trace of affricates in weak positions (Scheer 2004b).

We thus accept the validity of the point made above: the High German Consonant Shift has damaged stops in strong position, but less so than in weak positions. In any event, this pattern could surely be illustrated by some other, less disputed data set.

Regarding the relative strength of the two weak positions, the empirical record does not seem to allow for any generalisation. This ties in with what has been said in section 2.3: the intervocalic position and Codas have different clients, which are in almost complementary distribution. They act on two different fields and therefore do not "see each other". Telling whether the Coda is stronger or weaker than the intervocalic environment would require the comparison of the output that they produce in regard of a given phenomenon. The implicational relationship concerning spirantisation that has been reported in section 2.3 could be relevant evidence (spirantisation in Codas only if also intervocically). Given the poor intersection of both weak contexts, however, we rather refrain from making any firm statement:

\(^8\) Two-step defenders (e.g. Penzl 1969:65f, Szulc 1974:134, Davis & Iverson 1995) have not come up with any new argument since Braune (1874), and, if producing any evidence at all, repeat his two points: the gemination of resulting fricatives and the graphically witnessed secondary affricate > fricative simplification in post-Coda position due to non-homorganicity (e.g. helpfen > helfen). Scherer (1870:265), Fourquet (1948:80f, 91f), Schatz (1927:95), Schmitt (1949.20f) argue for the one-step scenario, and Braune (1874:47ff) himself actually explicitly admits this as a possible option.
the two weak positions illustrate two different ways of being weak, but it does not really make sense to rank them on a scale of positional strength.

2.6. Languages where phonology operates across word boundaries

Some languages do not bother for word boundaries: phonology works as if they were not there, a phenomenon that is sometimes called connected speech (e.g. Kaisse 1985).9 Hence word-initial consonants behave like their peers in post-Coda position if the preceding word ends in a consonant, while they follow intervocalic consonants when the preceding word ends in a vowel.

For example, connected speech is a typical feature of Central Italo-Romance, i.e. the middle part of the Italian peninsula including the islands of Corsica and Sardinia (see Giannelli & Savoia 1978-79, Dalbera-Stefanaggi 2001b). In Corsican for instance, consonants appear as either strong or weak according to positional parameters. Both varieties are contrastive in intervocalic position, but only strong representatives (i.e. geminates) occur 1) utterance-initially, 2) morpheme-internally after consonants and 3) word-initially if the preceding word ends with either a consonant or a stressed vowel (which in fact hides a former consonant that is now floating). On the other hand, weak consonants (i.e. voiced or spirantised variants) are observed 1) in intervocalic morpheme-internal position and 2) word-initially if the preceding word ends in an unstressed vowel (Dalbera-Stefanaggi 2001a:61ff, Dalbera & Dalbera-Stefanaggi 2004). Compare for example [in tæra] "on the ground" with [a dæra] "the earth", [un dënte] "a tooth" with [dui dënti] "two teeth", or (building on a tonic determiner) [tre ppân] "three breads" with [u bâne] "the bread".

This kind of sandhi phenomenon of course does not constitute counter-evidence for the basic pattern discussed in section 2.2, neither are we facing a case of initial weakness (in the sense of section 3.2). The languages at hand have simply "decided" to ignore certain word boundaries before applying phonological computation. Hence in these cases word-initial conso-

9 Of course, this is a phonologist's statement: it needs to be moderated by syntactic parameters: word boundaries are only invisible if the two words in question entertain a certain (intimate) syntactic relationship. Exactly which syntactic relationship allows phonology to seep through is a special field of investigation that has been covered by Prosodic Phonology in the past. Of course this question is orthogonal to the purpose of the present chapter.
nants are not word-initial at all when phonology applies: they are either post-consonantal or intervocalic and therefore show the regular behaviour of these positions. Rather than with a parameter on the strength of the initial site, we are dealing with one that operates on the overall visibility of boundaries, in the present case of word boundaries.\(^\text{10}\)

An example better known than Central Italo-Romance is Vedic: in the verse found in the Rigveda, phonology operates through word boundaries – but the verse-initial position patterns with the post-consonantal location. Sievers’ Law for example, a vowel-zero alternation typically involving [ij] and [j] (but also other sonorants, see Edgerton 1934, 1943, Ségéral & Scheer 2001a:124ff), is active in the Rigveda, where sjaam "to be 1st sg optative" for example appears after vowel-final words, whereas sijaam is found after consonant-final words and when initial in a line (also after words ending in a long vowel, but these in fact represent a VH sequence according to Saussure’s Laryngeal theory).

In sum, thus, what may appear to be a specific pattern of lenition in fact represents a much more general parametric choice concerning the visibility of boundaries, which may have a secondary effect when it comes to lenition. It is not anything that a theory of lenition needs to account for: phonological computation is one; it applies in exactly the same way in all languages quoted. The difference discussed stems from the input to the phonology: some morpho-syntactic divisions are shipped off to phonology, others are not, and languages are sovereign in opting for this or that interface decision.

2.7. Branching Onsets

Let us now have a brief look at branching Onsets. It was mentioned earlier that relevant evidence is rather scarce for branching Onsets are rare typologically speaking, and do not always react. Moreover, it is not easy to come up with a surface-true definition of branching Onsets. We therefore restrict the following discussion to the most typical case, *muta cum liquida.*

\(^\text{10}\) Note that morpheme boundaries show identical behaviour: they may or may not be visible to the phonology. The classical example here is the well-known contrast between level one vs. level two affixes in English (e.g. Siegel 1974, Mohanan 1986): the boundary of the former is invisible (e.g. consistent penultimate stress in both *párent* and *parént-al*), while the boundary of the latter affects phonology (compare with the “irregular” stress of *párent-hood*).
Let us thus consider the fate of Latin *muta cum liquida* in French – recall that we already know the result for simplex obstruents from section 2.2: they are restored without any damage in word-initial and post-Coda position, but systematically experience lenition intervocalically.\(^\text{11}\)

(4) evolution of Latin *muta cum liquida* in French (muta = labial and dental)

<table>
<thead>
<tr>
<th></th>
<th>post-Coda</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>pr</td>
<td>&gt; vr</td>
<td>prune</td>
</tr>
<tr>
<td>br</td>
<td>&gt; vr</td>
<td>bras</td>
</tr>
<tr>
<td>tr</td>
<td>&gt; ør</td>
<td>tr(\text{e}g)s</td>
</tr>
<tr>
<td>dr</td>
<td>&gt; ør</td>
<td>dr(\text{u}p)pu</td>
</tr>
</tbody>
</table>

The overall result is quite striking: for any given position, obstruents engaged in *muta cum liquida* behave exactly as their simplex peers. This may be seen when comparing (4) with (2): labials for example are preserved in strong position (pr\(\text{u}r\)na = \(p\)orta, tal\(\text{a}p\)ra = pr\(\text{u}r\)p(u)ra), but spirantise intervocalically (ri\(p\)a = capra > \([v]\)). The reader may verify that the behaviour of dentals in isolation and before a sonorant is also identical.

The case discussed thus gives clear indication to the end that obstruents experience the same conditions when occurring in isolation and in branching Onsets. However, we do not have any solid cross-linguistic basis for granting a more general value to this pattern. Further study must show whether it also governs other languages.

3. Parametric variation I: edges may or may not follow the internal half of the two disjunctions

The two disjunctions that are motivated by lenition are exactly symmetric both in their structural description and regarding the effect produced: the

\(^{11}\) As before, the data shown are selected and incomplete – something that does not affect their representativity. For example, clusters where the liquid is a lateral as well as those where the obstruent is a velar are not illustrated. In the latter case, this is because in addition to the proper action of lenition, the surrounding vowels bear on the result. Also, we do not distinguish primary (e.g. um\(b\)ra) from secondary (e.g. purp(u)ra) clusters: their behaviour is identical. Finally, note that the Coda column is missing since of course obstruent-sonorant clusters cannot occur in a Coda. Relevant literature regarding the evolution at hand includes Bourciez & Bourciez (1967;§§132,144,168).
Coda __{#,C} induces weakness, while the Strong Position {#,C}__ con-
fers strength. This can hardly be taken as an accident and thus raises an
important challenge for phonological theory: any account needs to be able
to characterise each disjunction as a non-disjunctive, single and unique
phonological object, and moreover the two objects at hand must somehow
be the opposite of one another (Ségéral & Scheer 2001a).

Significantly, the same perfect symmetry also governs the parametric
situation. To cut a long story short, edges may, but do not need to follow
the internal part of the disjunction they are involved in. If they do, the regu-
lar pattern described in section 2 is derived: ___# behaves like ___C, and #__
follows C___. In some languages, however, word-final consonants part
company with internal Codas, in which case the only Coda position is ___C.
This situation is classically accounted for by extrasyllabicity. The same is
true on the other end of the string: in some languages, word-initial conso-
nants do not pattern with their peers in post-Coda position. Instead, they
behave like intervocalic consonants. Hence the only strong position in these
languages is after Codas.

Quite strikingly, systems where the halves of the two disjunctions have
the reverse distribution do not appear to exist: if only one half of the Coda
disjunction is subject to some lenition while the other remains unimpressed,
damage will concern internal Codas. Cases where final Codas react while
their internal peers do not are not on record. In the same way, we do not
know of systems where the initial, but not the post-Coda position is strong.
Impairment of the two strong and the two coda positions is thus only one
way: edges, but not internal sites, may part company.

In other words, the behaviour of edges in regard of positional strength is
parameterised across languages. Unlike the behaviour of morpheme-
internal positions, which appear to provoke the same effect everywhere:

---

12 At first sight, of course, final devoicing appears to be a massive counter-
example to this generalisation. We wish to make two points here. First, this
phenomenon is a notorious troublemaker: given that (intervocalic) voicing is a
typical instantiation of lenition, devoicing must be regarded as strengthening –
but it occurs in Coda position, a lenition-inducing environment. Second, it is
not so sure that “final” devoicing is really only final: as far as we can see, in-
ternal obstruent clusters in final devoicing languages always agree in voicing,
something that may be interpreted as a consequence of the weakness of the
leftmost consonant, which sits in a Coda and therefore is unable to sustain in-
dependent voicing (note that obstruents in internal Codas are always followed
by obstruents, otherwise the cluster will be a branching Onset).
post-Coda consonants are always strong, consonants in internal Codas are always weak, and so are intervocalic consonants (with the additional proviso discussed according to which the latter display two different kinds of weakness). Hence the five basic positions may not only be organised into two disjunctive clusters and one singleton as under (1): another meaningful classification is according whether or not they are adjacent to a morpheme boundary: the behaviour of __# and ___# is subject to parametric variation, while the three internal positions show invariable behaviour across languages.

3.1. Variation is caused by morphology: the parametric space

A reasonable interpretation of this situation is to say that the variation at hand has got nothing to do with phonology; rather, it is caused by morphology. That is, phonology itself does not vary throughout all patterns mentioned: invariable domestic phonological rule produces the stable morpheme-internal situation shown, which may be altered as soon as morphology has a word to say, i.e. at morpheme edges.\(^\text{13}\)

The following table shows the parametric space that is opened by the variability of edges.

(5) parametric variation of the positional strength of edges

<table>
<thead>
<tr>
<th>Strong Position</th>
<th>Coda</th>
</tr>
</thead>
<tbody>
<tr>
<td>#</td>
<td>C_</td>
</tr>
<tr>
<td>a. French</td>
<td>strong</td>
</tr>
<tr>
<td>b. Greek</td>
<td>≠ strong</td>
</tr>
<tr>
<td>c. Polish</td>
<td>_</td>
</tr>
<tr>
<td>d. Braz. Portugese, French</td>
<td>weak A</td>
</tr>
</tbody>
</table>

The situations under (5)a and (5)d have already been illustrated by the evolution of Latin obstruents in French (section 2) where both the Strong Position and the Coda is disjunctive. Among many others, Brazilian Portu-

\(^\text{13}\) Note that this does not tell us whether the word-initial location is strong or weak "by nature", i.e. when phonology rules alone; symmetrically, the same holds true for final Codas: data will not tell us whether they are weak or non-weak on the domestic phonological count.
guense is another case in point concerning (5)d: in this language l-vocalisation affects laterals in both internal and final Codas (compare for example Europ. Port. sa[l]eiro, sa[l], sa[l]-gar, ca[l]sa with Braz. Port. sa[w]eiro, sa[w], sa[w]-gar, ca[w]sa "salt cellar, salt, to salt, trousers").

The pattern that is commonly referred to as extrasyllabic, i.e. (5)c, does not really need further illustration: the literature on extrasyllabicity has firmly established the cross-linguistic reality of cases where word-final consonants refuse to undergo Coda effects, while internal Codas are damaged (e.g. Hulst & Ritter 1999 and Rubach 1999:292ff). Polish may be quoted as a case in point. In this language, the palatal nasal "implodes" in internal, but not in final Codas: the result is a nasalised glide [j] (e.g. Ostaszewska & Tambor 2000:51s,61s, Scheer 2004a:§582). The words for "horse" and "rogue" for example are koń [kɔɲ] and drań [draɲ] in NOMsg, and konia [kɔɲa], drania [draɲa] in GENsg. Here the palatal nasal is undamaged. When the adjectival marker -ski is suffixed, however, the result is koń-ski [kɔjski] "of the horse" and drań-ski [drajski] "of the rogue" with a glidified nasal. The damage of the palatal nasal may also be observed morpheme-internally: taniec [taneɛ] means "dance NOMsg"; its last vowel alternates with zero and is absent when a vowel-initial suffix is added. Since this puts the preceding palatal nasal into contact with the following consonant, the nasal lenites: tańc-a [taɲtsa] "dance GENsg", tańc-yeć [taɲtsɛ] "to dance" (a verb whose imperative is tańcz! [taɲtʃ] "dance!").

We now set out to introduce the missing parametric situation (5)b where word-initial consonants are not strong. Since little attention was paid to the Strong Position disjunction in the past, its parametric variation also needs to be empirically grounded. We therefore review two cases in point, Greek and the Mazovian dialect of Polish.

3.2. When word-initial consonants are weak I: Greek

The Greek evidence to be introduced is again of diachronic character: it concerns the evolution from Classical to Modern Greek. The philological and socio-linguistic situation (diglossia: Demotic vs. Katharevusa) is quite intricate and cannot be exposed here. Seigneur-Froli (2001,2003,forth) provides relevant discussion; data and analysis below follow her presentation.

Classical Greek possesses three series of stops: plain voiced β,δ,γ [b,d,g], plain voiceless π,τ,κ [p,t,k] and aspirated voiceless φ,θ,χ [pʰ,tʰ,kʰ].
In the evolution towards Modern Greek, some of these stops were lenited and now appear as fricatives. This spirantisation is conditioned by three factors: 1) the position in the string, 2) the voice value of the stops and 3) aspiration. That is, voiced stops have spirantised across the board no matter which position they occurred in (except in homorganic NC clusters). Plain voiceless stops have spirantised in Coda position (e.g. κλέπτης > κλεφτης "thief"), but appear without damage everywhere else: word-initially (πατήρ > πατερας "father"), after Codas (ἐκπλέω ek-pleō > ἐκπλέω [ek-pleo] "to set out (ship)") and in intervocalic position (ἐπειδῆ ἐπειδῆ > ἐπειδῆ [epiDi] "since").

The remaining series, aspirated voiceless stops, is the one that demonstrates the weakness of word-initial consonants. Consider their evolution under (6) below (in each column, Classical Greek forms are followed by their Demotic reflexes). 14

(6) evolution of Classical Greek voiceless aspirated stops in Demotic

<table>
<thead>
<tr>
<th></th>
<th>a. #</th>
<th>b. post-Coda</th>
<th>c. Coda</th>
<th>d. V__V</th>
</tr>
</thead>
<tbody>
<tr>
<td>p&lt;sup&gt;h&lt;/sup&gt;</td>
<td>p'ero</td>
<td>dysp'oria</td>
<td>δισφορία</td>
<td>op'thalmos</td>
</tr>
<tr>
<td>t&lt;sup&gt;h&lt;/sup&gt;</td>
<td>thalasa</td>
<td>ophth'almos</td>
<td>ofthalmos</td>
<td>οφθαλμός</td>
</tr>
<tr>
<td>k&lt;sup&gt;h&lt;/sup&gt;</td>
<td>kh'aris</td>
<td>dush'keraino</td>
<td>ὄξικερενο</td>
<td>ὄξικερενο</td>
</tr>
<tr>
<td>χάρις</td>
<td>χαρη</td>
<td>δισχερείνο</td>
<td>ὄξι</td>
<td>ὄξι</td>
</tr>
</tbody>
</table>

As may be seen, classical φ, θ, χ spirantise intervocalically, in Codas and in word-initial position. Stopness on the other hand is retained only in post-Coda position. Hence the Strong Position in Greek is not disjunctive: only consonants in post-Coda position are shielded against damage (to a certain extent: they lose aspiration) – consonants in all other positions spirantise, namely word-initially. The beginning of the word is thus a weak environment in Greek, which therefore instantiates pattern (5)b.

14 Classical Greek allows for unorthodox initial clusters: #pt, #kt (as well as their voiced and aspirated counterparts) and #mn. There is ample evidence to the end that these groups are heterosyllabic (Steriade 1982), and they indeed show regular behaviour according to this pattern (i.e. C₁ shows the reaction of Codas, C₂ of post-Codas). We will come back to the existence of these clusters in section 3.4 below. Evidence for grey-shaded cells is missing. Glosses for table (6) (line by line): to carry, anxiousness, eye, arrival, sea, eye, veil, grace, support with uneasiness, height, rock.
3.3. When word-initial consonants are weak II: Mazovian Polish

A classical topic in Polish phonology are so-called soft labials, i.e. labials "with a palatal appendix" that are traditionally transcribed p', b', v', f' and m'. The opposition between soft and plain labials appears most clearly in root-final position: the regular masculine singular suffix for adjectives is -y (e.g. młod-y [młɔd-i] "young masc."). Before soft labials, however, [-i] surfaces: głupi [gwupi] "idiotic masc." (compare with the regular behaviour of a non-soft labial: grub-y [grubi] "fat masc."). The identity of the [p] as a soft labial may be established independently when looking at the feminine form of the adjective where the regular marker is -a (e.g. młod-a "young fem."): in the result głupia [gwupja] "idiotic fem.", the presence of a following -a makes appear the palatal appendix of the soft labial on the surface (unlike when preceded by a non-soft labial: gruba [gruba] "fat fem.").

Now consider what soft labials have become in North-Eastern dialects of Polish, especially in Northern Mazovia and a particular subdivision thereof, the Kurp region. For the sake of exposition, we illustrate only b'; the behaviour of p', f', v' and m' is analogous.16

(7) soft labials in two Polish dialects: Northern Mazovian and Kurp

<table>
<thead>
<tr>
<th>Polish spelling</th>
<th>Polish</th>
<th>North. Mazovian</th>
<th>Kurp</th>
<th>gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>initial biały</td>
<td>bjawi</td>
<td>bjawi</td>
<td>bʒawi</td>
<td>white</td>
</tr>
<tr>
<td>medial kobietę</td>
<td>kobjeta</td>
<td>kobjeta</td>
<td>kobjeta</td>
<td>woman</td>
</tr>
<tr>
<td>final drób</td>
<td>drup</td>
<td>drupć</td>
<td>drupć</td>
<td>poultry</td>
</tr>
</tbody>
</table>

As may be seen, the two dialects present a fricative in place of the Polish palatal element. In both dialects, this fricative agrees in voicing with the preceding obstruent (also note that word-final b', eventually followed by the palatal element, undergoes regular final devoicing). The nature of the fricative, however, is different in the two dialects at hand: a straight palatal

15 The literature opposes two interpretations around the question (originally raised by Baudouin de Courtenay) whether soft and plain labials represent one or two series of phonemes: e.g. Press (1986:25ff), Jassem (1966), Rubach (1984:165ff), Gussmann (1992, 2004).
16 The phenomenon at hand is fairly well studied in the Polish dialectological literature, e.g. Friedrich (1955), Furdal (1955), Dejna (1994: map 18). Our presentation heavily draws on Czaplicki (1998) and Kijak (forth).
[ç,ʝ] in Northern Mazovian, against what the IPA calls "alveolo-palatal" (also commonly called "prepalatal") fricatives [ɕ,ʑ] in Kurp.

Given the segmental change from a glide to a fricative, we are certainly entitled to talk about fortition, especially in the case of the result produced in Kurp. We therefore do not need to enter into a debate that is led in the Polish (dialectological) literature which concerns the question whether soft labials should be regarded as one single segment (i.e. with a secondary articulation in the spirit of kʷ) or two independent phonological items (also called synchronous vs. asynchronous, e.g. Klemensiewicz et al. 1964:131).

In the light of everything that we know about lenition and fortition, the only consistent analysis supposes a two-segment status for soft labials in the dialects at hand. That is, the secondary articulation of a single (contour) segment could not possibly undergo strengthening. It is only when secondary articulations emancipate from their host that they can be addressed as an independent phonological object – they are then indeed found to regularly undergo strengthening. Relevant cases are reported from many Occitan dialects where Latin kʷ as in *aqua [akʷa] "water" comes out as [jg]: Occitan aigue [ajgə] "water" (Dalbera 1994:434ff). Here, the secondary articulation has been linearised. The result is a heterosyllabic cluster /ak.wa/ with [k] in Coda- and [w] in post-Coda position. The former then lenites to [j] in weak position, while the latter strengthens to [g] in Strong Position. A parallel case is so-called Meillet’s Law (Meillet 1925:6f, Lamberterie 1998): in Armenian, Indo-European *dwoo "two" comes out as erku "two" where [d] in Coda position has lenited to [r], while post-Coda [w] has strengthened to [k].

Hence whether Polish soft labials are one or two segments may be subject to debate – prior to the strengthening of the palatal element, their Mazovian peers have been two independent segments for sure.

If this is true, however, then we also expect strengthening of yod word-initially: the Strong position is disjunctive. But word-initial yod does not strengthen in either of the dialects considered, which respond to Polish jabíkő, jagóda, jeleni, jutro (all [j-]) "apple, berry, deer, tomorrow" with unaltered initial yod. Also, [j] comes out unchanged in all weak positions: V__V dojąć, jajeczko, zając "arrive, small egg, rabbit", __C bajka, czajnik "fairy tale, kettle", __# bój, kraj "battle, country".

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17 To the extent that yod in Coda position is an autonomous consonant, rather than the second part of a diphthong, something that probably is analysis-dependent but does not impact the ongoing discussion: if there is no Coda-yod,
The overall situation is thus the same as in Greek: the only strong position in the two Polish dialects at hand is after a heterosyllabic consonant. Word-initial consonants are not strong: they pattern with weak positions.

It is instructive at this point to contrast the Polish situation with a development in Gallo-Romance that is exactly parallel, except that, as expected when looking at (2), word-initial consonants go along with their peers in post-Coda position.

In Gallo-Romance, yod has come to stand after consonants because Latin short high and mid vowels have become glides in late Latin when occurring before another vowel (e.g. *filia, vidua* "widow, daughter" > *filja, vgdwa*). As in the Polish dialects, the classical literature makes a difference between cases where yod follows a labial and those where it comes to stand after other consonants (e.g. Bourciez & Bourciez 1967:§§28,30-3°). Consider relevant evidence under (8) below.

(8) evolution of Gallo-Romance yod in Strong Position

<table>
<thead>
<tr>
<th>a. #</th>
<th>b. post-Coda</th>
</tr>
</thead>
<tbody>
<tr>
<td>#j &gt; 3</td>
<td>ʒō</td>
</tr>
<tr>
<td>#j &gt; 3</td>
<td>ʒwe</td>
</tr>
<tr>
<td>#j &gt; 3</td>
<td>ʒu</td>
</tr>
<tr>
<td>#j &gt; 3</td>
<td>ʒezir</td>
</tr>
</tbody>
</table>

As in the Polish dialects, the resulting fricative has a palatal colour and agrees in voicing with the preceding obstruent (also note that the original result of the strengthening were affricates [dʒ, tʃ], which have lost their stop element in further evolution). Subsequently to the strengthening process, this obstruent has been regularly lost in Coda position in the same way as all other labials (cf. (2), except the nasal which leaves a trace on the preceding vowel).

---

we can still build on the behaviour of its intervocalic instantiation. Also note that Kijak (forth) reports on some variation in pre-consonantal position, where yod is sometimes dropped.

We actually believe that this distinction is wrong: Gallo-Romance C+j always leads to the strengthening of yod, no matter what the preceding consonant. This is what Ségéral & Scheer (2001b) aim at showing. A more careful introduction to the subject may also be found there. In any event, whether yod strengthens only after labials or also elsewhere leaves the ongoing discussion untouched.

---

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Only that this time word-initial yod also undergoes fortition, with exactly the same result ([dʒ] > [ʒ]). This fortion in the two Strong Positions contrasts with the weakening of yod that is observed in Codas and intervocalically: maj(u) > mai [me] "May", raja > rai[e] "ray". Hence the same process, fortion of yod to a palatal fricative, occurs in both word-initial and post-Coda position in Gallo-Romance, while it is observed only in the latter context in the two Polish dialects.

The typological picture thus is consistent: Gallo-Romance illustrates the parametric situation (5)a, while the two Polish dialects at hand follow (5)b.

3.4. Conclusion: relation with restrictions on initial consonant clusters?

Typologically speaking, Greek and Polish on one hand are thus opposed to (Gallo-) Romance and German(ic) (recall the High German Consonant Shift discussed in section 2.5) on the other. The former group has only one strong position, i.e. after Codas (5)b, while consonants are strong both in post-Coda and word-initial position (5)a in the latter.

Seigneur-Froli (2001,2003) and Kijak (forth) observe that these two groups are opposed with respect to yet another feature that regards the beginning of the word. Romance and Germanic are languages that strictly observe the usual restrictions on word-initial consonant clusters: anything different from obstruent-sonorant is banned. By contrast, both Polish and Greek allow for sequences that violate sonority sequencing. Classical Greek presents for example #pt, #kt and #mn, while clusters such as in rdza, rızć, rwać [rvacet], lgac, mgla, mżawka [mʒafka], msza [mʃa], mleko, mrugać, ptak, tkać, dbać "rust, mercury, to tear up, to lie, mist, drizzle, mass (rel), milk, to wink, bird, to weave, to care" are found in Polish (Rowicka 1999:309ff provides the exhaustive list).

Seigneur-Froli and Kijak contend that this typological agreement is not accidental, and that indeed the word-initial position in Polish and Greek is weak because these languages allow for initial clusters which exceed the obstruent-sonorant pattern.19 And, conversely, the initial position is strong

---

19 Actually, as argue Seigneur-Froli and Kijak, the behaviour of the second member of Polish and Greek initial clusters in regard of lenition is a strong argument against the ordinary extrasyllabic interpretation of their first member: fortition (or protection against lenition) is observed in post-Coda position; hence if C₂ of a #C₁C₂ cluster is strong, C₁ must be a Coda (rather than extrasyllabic).
in Romance and Germanic because these languages restrict initial sequences to #TR. Or rather, the two agreeing typological properties are manifestations of the same parameter setting that regulates the properties of the left edge of the word.

If this is correct, then we do not expect word-initial consonants to be strong in languages that tolerate initial non-TR sequences; and we would be surprised to see weak initial consonants in #TR-only languages. Whether this typological prediction holds true or not is an empirical question – we believe it is interesting enough to be reported, even though its empirical grounding needs to be broadened.

Finally, we wish to make another prediction regarding edges. It makes perfect sense to us that morphology may override domestic phonological rule: the intervention of higher modules in phonology produces the variation at morpheme boundaries (#__ and __#) that we observe, against a typologically invariable situation within morphemes (C.__, V__V and __.C). Hence if in some language only half of the Coda disjunction is weak (the other half being non-weak), or only half of the Strong Position disjunction is strong (the other half being non-strong), the halves that are singled out for weakness and strength will be morpheme-internal. That is, we do not believe that languages exist where word-initial consonants are strong, while their peers in post-Coda position are non-strong; or, for that matter, where word-final consonants are weak, while their peers in internal Codas show non-weak behaviour.

In sum, thus, we believe that the variation regarding both edges that has been described is not of phonological origin. Rather, it translates the fact that higher modules, i.e. syntax and morphology, may alter the regular domestic course of phonology at morpheme- and/or word junctures. Hence a theory of lenition that attributes the variation at hand to a phonological mechanism, we argue, is necessarily erroneous. The phonological computation that produces lenition is the same in all cases irrespectively of the status of edges: there is only one lenition mechanism. The input to this unique mechanism, in case some juncture is included in the string submitted, may be altered by decisions of the interface with higher modules, hence which are taken outside of the phonology. Therefore the theory of lenition, which of course is only phonological, must not take into account the variation at edges – but of course it needs to be coupled with an interface theory in such a way that 1) the unattested patterns (post-Coda weak, initial position strong; internal Coda strong, final Coda weak) are ruled out and 2) the attested variation follows from the properties of the interface.
4. Parametric variation II: post-Coda consonants may or may not be strong after sonorants

The behaviour of consonants in post-Coda position is also subject to parametric variation: they may either be strong no matter what, or they may be strong only after obstruents, while following a weak pattern after sonorants. Hence the variation at hand depends on the preceding Coda: either languages "look" at its content, or they do not. In case they do, the effect appears to be cross-linguistically stable: preceding sonorants provoke weakness of the post-Coda consonant, while preceding obstruents induce (regular positional) strength. The reverse distribution (i.e. strength after sonorants, weakness after obstruents) does not seem to exist – we would be surprised if it did.

The common sense analysis of this fact of course builds on the sonority hierarchy: sonorants are more "vowel-like" than obstruents and hence more likely to make the following consonant believe it is preceded by a vowel, thereby creating a "virtual" intervocalic position (R.__V = V__V vs. T.__V). This surface description of facts is probably on the right track, and we believe that any theory which sets out to encode this parameter will have to somehow make reference to sonority and the fact that sonorants have a greater affinity with vowels than with obstruents.

The parameter on the behaviour of consonants after sonorants is independent from the one that was discussed in section 3: consonants in post-sonorant position may or may not be strong both in systems where word-initial consonants are strong and in those where they are weak. The two parameters may be crossed, and we thus expect a four-way empirical record. This is indeed what we have found.

4.1. "Post-Coda strong no matter what"

We have already come across the pattern "post-Coda strong no matter what", associated to the option "word-initial consonants strong": Latin obstruents in the evolution towards French behave like that (section 2.2). Actually, table (2)b only illustrates the evolution of post-Coda consonants after sonorants – with a strong result: just like their word-initial peers, obstruents remain undamaged in this position. Hence we are fixed in regard of the parameter at hand. For the sake of exhaustivity, however, the following examples show that the same effect obtains after obstruents: [p] supp >
soupe "soup", crêper "to crimp", [t] rupta > route "road", gutta > goutte "drop", vectura > voiture "car", fête > fête "party" (velars are not illustrated for the same reasons as before).

French is thus a language "where nothing happens", e.g. where post-Coda consonants do not "look at" the content of the preceding Coda in order to determine their behaviour: they show a uniform reaction.

Also, another instance of the same pattern regarding post-Coda consonants, but this time associated to the option "initial position non-strong", has already been discussed: Mazovian Polish (section 3.3). Recall that here strengthening of yod occurs in both post-sonorant (mjastɔ > mjastɔ "city") and post-obstruent (pjasɛk > pjasɛk "sand") position, but not word-initially (jabłko > jabłko "apple").

4.2. "Strong after obstruents, weak after sonorants" plus "weak word-initially": Greek and Grimm's Law

A language that is governed by the other pattern has already been mentioned as well: Greek. Only that we hid away relevant evidence from the reader in section 3.2: table (6) only mentions words where voiceless aspirated stops occur after an obstruent. In this case indeed, stopness is retained (ophθαλμος or φθαλμος > φθαλμος "eye"). When the preceding Coda is a sonorant, however, even aspirated stops spirantise.20

<table>
<thead>
<tr>
<th>a. r</th>
<th>b. l</th>
<th>c. N</th>
</tr>
</thead>
<tbody>
<tr>
<td>ρb</td>
<td>ορφανος</td>
<td>ορφανος</td>
</tr>
<tr>
<td></td>
<td>ορφανος</td>
<td>ορφανος</td>
</tr>
<tr>
<td></td>
<td>ορφανος</td>
<td>ορφανος</td>
</tr>
<tr>
<td>r^b</td>
<td>orthios</td>
<td>orthios</td>
</tr>
<tr>
<td></td>
<td>orthios</td>
<td>orthios</td>
</tr>
<tr>
<td>k^b</td>
<td>arkhɔ</td>
<td>arxɔ</td>
</tr>
</tbody>
</table>

Greek thus combines the two parameter settings that take flesh off the Strong Position: consonants are neither strong in post-sonorant nor in

---

20 Glosses (line by line): orphan, brother, around, right/ straight, who causes worry, remorse, I begin.
word-initial position. In other words, the only strong environment in Greek is after obstruents.

In actual fact, this is also the pattern of Grimm's Law, one of the most studied lenition processes (although not necessarily under this label). Grimm's Law is usually described as a spontaneous sound shift whose relevant part for the present purpose has affected all Indo-European aspirated voiced and plain voiceless stops, which are spirantised without any contextual condition (see chapter XXX (Holsinger) for illustration and further discussion). Textbooks then mention some "exceptions" (Streitberg 1895:113 is one example in a long tradition): stops that occur after obstruents remain undamaged.21 Compare for example Lat. specio, captus, nocte with Old High German spehōn, haft, naht "to look out, captivity, night". On the other hand, stops do undergo spirantisation after sonorants: compare for example Lat. mentum, uerto with Gothic munþs, wairþan "mouth, to become". In other words, the correct description of Grimm-spirantisation is "everywhere (including the word-initial position) except after obstruents".

The striking parallel between Grimm's Law and the aforementioned Greek spirantisation has actually been pointed out by Fourquet (1948).

4.3. "Strong after obstruents, weak after sonorants" plus "strong word-initially": Korean, Finnish, Liverpool English (London & New York English)

Another group of languages also illustrates the pattern "strong after obstruents, weak after sonorants", but with the reverse parameter setting for the word-initial location: unlike in Greek and Common Germanic, word-initial consonants are strong here.

One case in point is Korean (e.g. Kang 1993, Silva 1993). This language has three series of plosive phonemes, all of which are usually assumed to be voiceless underlyingly: "lax" or "plain" /p,t,c,k/, "tense" or "glottalised" (but whose phonetic realisation is not ejective) /p',t',c',k'/ and aspirated /ph,th,ch,kh/ (Labrune 1999:133, Kang 2000:53f). Only the four-way allo-

21 Formulations found in the literature vary here (e.g. Schrodt 1976): most of the time this generalisation is actually not established because a special case is made for s+C clusters. This notwithstanding, the correct distributional statement when all instances of spirantisation-inhibition are put in a line is "after obstruents".
phony of the former is relevant for the present discussion: as is shown un-
der (10) below, regular voiceless stops [p,t,c,k] appear word-initially, either
voiced [b,d,j,ɡ] or tense [p',t',c',k'] plosives are found after Codas, voiced
stops [b,d,j,ɡ] are observed intervocally and unreleased voiceless stops
[p',t',k'] occur in both Codas (where in addition the contrast between /t/
and /c/ is neutralised in favour of the former).

(10) allophonic variation of plain voiceless stops in Korean

<table>
<thead>
<tr>
<th>a. #</th>
<th>b. post-Coda</th>
<th>c. Coda</th>
<th>d. V__V</th>
<th>gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>p</td>
<td>pap' pi</td>
<td>sil-bi</td>
<td>pap'k'irit' pap' pabi</td>
<td>boiled rice, rain, fine rain, bowl for rice, rice, rice +subj. rather than the bowl</td>
</tr>
<tr>
<td></td>
<td>poda</td>
<td>kuk'-p'oda</td>
<td></td>
<td>moon, id., half moon, to close and..., to receive, id.+ mark. too, the cloth too</td>
</tr>
<tr>
<td>t</td>
<td>tal</td>
<td>pan-dal</td>
<td>tat'k'o</td>
<td>pat' pada</td>
</tr>
<tr>
<td></td>
<td>to</td>
<td>ot'-t'o</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c</td>
<td>cip' cabi</td>
<td>son-jabi</td>
<td>c'it'k'o</td>
<td>nat' naji</td>
</tr>
<tr>
<td></td>
<td>cip'</td>
<td>pap'-e'ip'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>k</td>
<td>kuk' kogi</td>
<td>pul-gogi</td>
<td>mok'k'o</td>
<td>kuk' kugi</td>
</tr>
<tr>
<td></td>
<td>pap'</td>
<td>pap'-k'irit'</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

First consider that the behaviour of consonant clusters (columns (10)b
and the first half of (10)c), which may only be controlled when looking at
compounds. The word for "thread" sil [sil], when combined with pi [pi] "rain", produces sil-bi [silbi] "fine rain", where the underlying plain /p/ is
voiced after a sonorant. As may be seen one line down, however, plain
voiceless stops appear as strong tense stops when preceded by an obstruent
(kuk [kuk'] "soup" plus poda [poda] "rather than" comes out as kuk-poda
[kuk'p'oda] "rather than the soup"). Hence plain stops lenite after sono-
rants, but on the contrary strengthen after obstruents.

22 The picture is further complicated by the kind of morpho-syntactic relation that
both members of the compound contract. There are in fact two different kinds
of compounds, which are defined on morpho-syntactic grounds and produce
contrasting phonological results. Type A compounds are illustrated under (10).
Type B compounds are called sai-sios. Unlike under (10)b, their effect on plain
voiceless stops in post-Coda position is uniform no matter what the content of
the preceding Coda: tense stops are produced after obstruents (kuk [kuk']
Also, Korean provides interesting information regarding the identity of the post-sonorant position: as in Greek, we see that post-sonorant consonants are not strong, but in addition Korean shows that they behave like intervocalic consonants (i.e. they voice), rather than as Coda consonants (which would be unreleased). Greek is mute on this count because the result of lenition is identical in intervocalic and in Coda position. We are inclined to believe that the Korean testimony reveals the true identity of post-sonorant consonants in languages that make this environment weak. That is, languages like Greek and Korean consider sonorants as vowels, which means that the following consonant stands in intervocalic, not in Coda position.

Let us now briefly turn to another set of data that illustrates the weakness of post-sonorant consonants: Finnish Consonant Gradation. This phenomenon has received quite some attention in the literature (e.g. Campbell 1981, Keyser & Kiparsky 1984); it is described in detail in chapter XXX (Pöchtrager). The ground rule here is "onsets appear in strong grade in open, in weak grade in closed syllables", and a variety of strong and weak incarnations of segments are distributed according to this rather exotic triggering context.

Consider for example the alternation between kulta, ranta "gold, beach NOMsg" and kulla-n, ranna-n "id. GENsg": the concatenation of the genitive marker, which makes the last syllable close, triggers lenition of the last consonant of the stem, which in case of RT clusters results in the loss of the obstruent and the expansion of the preceding sonorant. That we face lenition may be seen when looking at the spirantising effect of the genitive on simplex intervocalic stops: leipä "bread NOMsg" comes out as leivä-n "id. GENsg". However, post-Coda obstruents are shielded against damage if the preceding Coda is an obstruent as well: the genitive of matka "journey NOMsg" is matka-n, not *matta-n. Finally, Finnish goes along with Korean, rather than with Greek and Common Germanic: word-initial consonants are shielded against damage as well. In order to see this, compare the action of the familiar pattern on riidellä "to argue, infinitive" (against non-lenited riitelen "id., 1st sg") with the fact that word-initial consonants remain undamaged even in closed syllables (tulla "to come, infinitive").

"soup" plus pap [pap] "rice" produces kukpap [kukˈpap] "rice soup") as well as after sonorants (pom [pom] "spring" plus pi [pi] "rain" comes out as pom-pi [pomp'i] "spring rain").
Honeybone (chapter XXX, 2001, 2002: 192ff, 2003) draws attention on another case in point: Liverpool English. The lenition pattern at hand has been described before in the literature, but he presents freshly collected and detailed data. The picture here looks very much like the High German Consonant Shift that was mentioned in section 2.5: while the word-initial position is strong, stops experience less lenition after obstruents than after sonorants (something that due to space restrictions we did not show for the High German Shift), except if the sonorant is homorganic (according to Honeybone's motto "sharing makes us strong"). The interlacing of positional, melodic (post-sonorant vs. post-obstruent) and sharing (homorganic vs. non-homorganic) factors is characteristic for the High German Shift and Liverpool lenition. The latter phenomenon, however, is the most complete (or most complex) lenition pattern that we know of for in addition to all the factors mentioned it is also sensitive to stress. Hence it cumulates the three basic forces that define lenition, each of which this book devotes a chapter to (chapters XXX (de Lacy-Bye, Honeybone)).

Another such multiple-factor conditioned phenomenon is post-tonic t-lenition in various varieties of English, which is also reported to be sensitive to whether the preceding consonant is a sonorant or an obstruent (Harris & Kaye 1990:265, Harris 1994:222ff). While flapping (New York) and glottaling (London) are observed in post-tonic position after sonorants23 (quarter, winter are pronounced with a flap or a glottal stop, respectively, instead of the t), neither damage occurs after obstruents (after, custard, chapter, doctor must be pronounced with a [t]).

Finally, the well-known Spanish (Castilian) spirantisation further illustrates the crossing of conditioning factors (e.g. Harris 1984, Harris-Northall 1990). Here voiced stops /b,d,g/ spirantise in Coda position and intervocally, while stops [b,d,g] appear word-initially and after Codas. Due to space restrictions, we limit illustration to the dental: [d]inero "money", an[d]ar "to go", a[l]mirar "to admire", na[l]a "nothing". However, stops appear in post-Coda position only if the preceding Coda is a (homorganic) nasal, or a lateral in the case of /d/ (e.g. al[d]ea "village"). In all other combinations, spirantisation prevails: e.g. ar[b]ol "tree", al[b]a "dawn", dez[b]okado "packed up", a[l]βikar "to abdicate". Even though the exact

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23 Except after the lateral in New York – but this is obviously due to the particularly intimate relationship between the two members of it, ld clusters that is also known from Spanish spirantisation, which is inhibited in the same context (see the following paragraph).
conditioning remains somewhat mysterious (lateral-dental stop sequences, but not rhotic-dental stop clusters seem to be "homorganic"), the basic regularity "weak version after sonorants" also governs the Castilian pattern.

4.4. Lenition and stress tell us that sonority is not a melodic prime

Although the rule of the game of this part of the book is to refrain from making theoretical points, we cannot elude a striking parallel between lenition and stress: both phenomena, as a parametric choice, may be sensitive to sonority – but remain absolutely unimpressed by any other melodic variation such as place of articulation, nasality, voicing and so forth.

At the outset of this chapter we have followed a definition of lenition according to which this process, unlike assimilation, is positional and only positional: no exchange of melodic primes, no sensitivity to the melodic properties of neighbouring segments. Hence the parameter discussed in section 4 should not exist in the first place since the melodic quality of an adjacent segment, the Coda consonant, bears on the strength of its righthand neighbour.

On the face of it, thus, the definition that builds on the strict separation between the assimilatory and the positional world simply appears to be wrong. But a second thought is worthwhile: there does not seem to be any language on record where some other melodic property, say, labiality, voicing or palatality, has any bearing on the strength of an adjacent consonant. Thus roles are not distributed randomly: of all features, sonority alone is a lenition-relevant player.

Quite strikingly, the same generalisation holds for stress: of all melodic properties, only sonority may influence stress placement, which is otherwise a pure matter of positional computation. The fundamental parameter here is commonly called Weight by Position (after Hayes 1989): languages may count closed syllables (CVC) as either heavy (hence patterning with CVV), or light (hence patterning with CV). A third parametric situation, although rare, has been identified, most clearly in native American Algonquian-Wakashan languages (Kwakwala and Nuuchahnulth, see Boas 1947, Wilson 1986, Zec 1988, 1995:103ff, Gordon 2002:923f). Here, closed syllables are heavy only if their Coda is a sonorant (i.e. CVR, CVV heavy, against CVT, CV light). By contrast, the rather advanced cross-linguistic record established foremost in the work of Hayes (1995) does not mention any case where other segmental features influence stress placement. This is
also confirmed by Gordon's (1999,2004) typological work on weight distinctions.

The same holds true for stress algorithms that look at the quality of vowels, rather than of consonants. Paul de Lacy has studied this question in detail. He writes:

"One issue this typology raises is not why stress is sensitive to sonority, but rather why it is not sensitive to so many other properties. There are no stress systems in which subsegmental features such as Place of Articulation or backness in vowels plays a role in assigning stress. The same goes for features such as [round], [nasal], and secondary articulation." de Lacy (2002:93)

This converging evidence regarding sonority is certainly not accidental. It raises a question that goes down to the very foundations of phonology: what kind of animal is sonority? This notion has always been central in phonology: the 19th century talked about strength directly (Fortis, Media, Lenis), while the take of classical generative work was to make it a regular feature (or regular features: [±son], [±syll] etc.) on a par with all other melodic primes such as palatality, roundness, voice etc. (eventually segregated on a particular branch of a feature-geometric tree). There have also been attempts at understanding sonority as a non-primitive property that derives from true melodic primes: the notion of complexity that is used in Government Phonology (Harris 1990, Scheer 2004a:§36) and Rice (1992) is a case in point (the more primes you are made of, the more/ the less sonorous you are).

The conclusion which we are incline to draw from the absence of melodic conditions on lenition and stress patterns is that melodic primes have no bearing on positional events at all. In other words, the original definition of lenition was correct. Hence sonority is not a melodic prime (a feature) – it is something else. Something that is visible for syllable structure and stress, i.e. for things that are located in the representational area above the skeleton. If this perspective is correct, it follows that phonological theory must not encode sonority as a lexical object of its own: sonority has no featural existence.
5. Conclusion

The goal of this chapter was to identify the positional patterns that influence lenition and fortition. Positions may be strong or weak according to the ground rule that has been introduced in section 2. On this basis, languages make parametric choices along two lines: edges may or may not be special, and consonants that occur after sonorants may or may not be strong.

Regarding the former parameter, we wish to point out the perfect symmetry of the emerging picture: edges may go along with the other half of the disjunction that they are engaged in. That is, word-initial consonants may either follow their internal strong mate (yielding a disjunctive Strong Position {#,C}_) or not (in which case the only strong position is internal: C._). Word-final consonants may follow their internal weak mate (creating the familiar Coda disjunction __{#,C}) or not (in which case the only Coda position is internal: __.C).

We are confident that this situation reflects a deeply rooted phonological reality for two reasons: nature is typically symmetric; in any event symmetry does not arise through chance. And also, the obvious role of morphology (or other higher modules) in this picture makes sense: positions that escape extra-phonological influence, i.e. those located inside of morphemes (__.C, V__V, __.C), are not subjected to cross-linguistic variation. By contrast, positions that are adjacent to a morphological boundary show variable behaviour (#__ , __#). This simply means that higher level rule may either govern into domestic phonological matters, or leaves phonology alone.

Therefore we believe that any theory needs to somehow express the variable effect of edges by the intervention of morpho-syntax: a domestic phonological solution will not do. Exactly how this higher level intervention is carried out needs to be determined according to the idiosyncratic vocabulary of each particular theory.

The empirical generalisations that we have made also prompt some predictions: there are patterns which we would be surprised to see in natural language. They appear in table (11) below and may be taken as a check-list for lenition phenomena.24

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24 Unless otherwise specified, "strong position" refers to {#,C}_, "weak position" to the complementary set V__V and __{#,C}.
(11) lenition patterns: those that do occur, and those that should not are attested we believe do not occur

a. a strong position is at least as strong as a weak position.
   a weak position is stronger than a strong position.
   b. a weak position is at least as weak as a strong position.
   a strong position is weaker than a weak position.
   c. C.__ strong, #__ weak C.__ weak, #__ strong
   d. __C weak, __# non-weak __C non-weak, __# weak
   e. C.__ weak after sonorants,
      strong after obstruents C.__ weak after obstruents, strong
   f. in case __C weak and __# non-weak, __C non-weak, __# = intervocalic
      in case __C weak and __# non-weak, #__ = Coda

The parametric space that is opened by the variation (and the non-variation) described is shown under (12). Only the intervocalic position does not show any variation (always weak A). Strong positions vary according to two parameters, i.e. whether word-initial consonants are strong or not, and whether post-sonorant consonants are strong or not. The resulting four-way typology is illustrated in the first four lines of the table. The remaining two lines show the variation that is observed in Codas, i.e. whether word-final consonants are weak or not. In all cases, cells irrelevant for the illustration of the variation at hand are grey-shaded.

(12) spell-out of the parametric space and illustration thereof

<table>
<thead>
<tr>
<th>example</th>
<th>Strong Positions</th>
<th>Weak Positions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>initial</td>
<td>post-Coda</td>
</tr>
<tr>
<td>a. Gallo-Romance</td>
<td>strong &amp; weak</td>
<td>strong</td>
</tr>
<tr>
<td>b. Mazovian Polish</td>
<td>weak &amp; strong</td>
<td>strong</td>
</tr>
<tr>
<td>c. Greek, Grimm's L.</td>
<td>weak &amp; strong</td>
<td>strong</td>
</tr>
<tr>
<td>d. Korean, Liverpool English (NY &amp; London English)</td>
<td>strong &amp; weak</td>
<td>strong</td>
</tr>
<tr>
<td>e. Gallo-Romance, Braz. Portuguese</td>
<td>weak A</td>
<td>weak B</td>
</tr>
<tr>
<td>f. Polish</td>
<td>weak A</td>
<td>weak B</td>
</tr>
</tbody>
</table>

Finally, there are two ways of being weak, and in some cases languages do not allow to tell whether the position that is deviating from the canonical
disjunctive pattern goes along with intervocalic or Coda weakness. In this case, the simple mention "weak" does not differentiate. Also, Polish word-final palatal nasals do not react like internal Codas – but the language does not tell us whether they have intervocalic or even strong value. For the time being, we are unable to make any generalisation as to what happens when consonants in a position whose strength is parameterised do not follow the canonical disjunction. We leave this question open for further study.

In sum, thus, the empirical situation raises the following four challenges for phonological theory that need to be added to the coverage of the patterns under (11) and (12).

(13) theories of lenition must be able to

a. reduce the two disjunctions:
   the Coda context __#{#,C} and the Strong Position #{#,C}__ represent
   one single and unique phonological object each. Theory must determine
   their non-disjunctive phonological identity.

b. explain the mirror effect:
   the Coda and the Strong Position are opposite in both their structural
   description and their effect. Hence whatever the non-disjunctive identity
   for either context that a theory proposes, it must somehow be the reverse
   of the other.

c. explain the distribution of strength and weakness:
   why does #{#,C}__ provoke strength rather than weakness, and __#{#,C},
   V__V weakness, rather than strength?

d. differentiate between two weak positions:
   there are two ways of being weak: intervocalic weakness and Coda
   weakness; both may, but do not need to produce the same effect.

At the end of this survey, we wish to stress once more that our window on the cross-linguistic reality is utterly narrow: no doubt many facts about lenition escape our appraisal. Hence the generalisations that have been formulated only represent our fragmentary visibility, which we have tried to solidify as much as we could through the literature. This not withstanding, our assessment remains rooted in certain language families more than in others: Romance, Germanic, Slavic, Semitic and Cushitic. We hope it will be confronted with evidence from more genetic variety in the future.
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

Beckman, Jill

Blevins, Juliette

Boas, Franz

Bourciez, Edouard, and J. Bourciez

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Davis, Garry, and Gregory Iverson

Davis, Garry, Gregory Iverson, and Joseph Salmons

De Lacy, Paul

Dejna, Karol

Dienes, Péter

Edgerton, Franklin

Escure, Geneviève
1977 Hierarchies and phonological weakening. Lingua 43: 55-64.

Foley, James

Friedrich, Henryk

Furdal, Antoni

Giannelli, Luciano, and Leonardo Savoia

Gordon, Matthew
2002 Weight-by-position adjunction and syllable structure. Lingua 112: 901-931.
Gussmann, Edmund

Harris, James

Harris-Northall, Ray

Harris, John

Harris, John, and Jonathan Kaye

Hayes, Bruce

Honeybone, Patrick

Hulst, Harry van der, and Nancy Ritter
Jassem, Wiktor  

Kaisse, Ellen  

Kang, Mi-Young  

Kang, Ongmi  

Kenstowicz, Michael  

Kenstowicz, Michael, and Charles Kisseberth  

Keyser, Samuel, and Paul Kiparsky  

Kijak, Artur  

Kirchner, Robert  


Klemensiewicz, Zenon, Tadeusz Lehr-Spławinski, and Stanislaw Urbanczyk  
1964 *Gramatyka historyczna języka polskiego*. Warszawa: PWN.

Labrune, Laurence  

Lamberterie, Charles de  

Meillet, Antoine  
Mohanan, Karuvannur
Niedermann, Max
Orwin, Martin
Ostaszewska, Danuta, and Jolanta Tambor
2000 Fonetyka i fonologia współczesnego języka polskiego. Warszawa: PWN.
Palmer, Leonard
Paul, Hermann, Peter Wiehl, and Siegfried Grosse
Penzl, Herbert
Press, Ian
Rice, Keren
Rohlfs, Gerhard
Rowicka, Grażyna
Rubach, Jerzy
Schatz, Josef
Scheer, Tobias
References 41

Scherer, Wilhelm

Schmitt, Alfred

Schrodt, Richard

Ségéral, Philippe, and Tobias Scheer
1999a The Coda Mirror. Ms, slightly less evolved English version of Ségéral & Scheer 2001a. TOB.
2001b Les séquences consonne + yod en gallo-roman. Recherches Linguistiques de Vincennes 30: 87-120. TOB.

Seigneur-Froli, Delphine
2001 De la lénition des "Codas" initiales en grec. DEA thesis, Université de Nice. TOB.

Siegel, Dorothy
1974 Topics in English Morphology. Ph.D. dissertation, MIT.
Silva, David

Smith, Jennifer

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

Streitberg, Wilhelm

Szigetvári, Péter

Szulc, Alexander
1974 *Diachronische Phonologie und Morphologie des Althochdeutschen*. Warszawa: PWN.

Vijayakrishnan, K.G

Wilson, Stephen

Zec, Draga

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