The phonological word in Tilburg Dutch: Government phonology and a city dialect of Dutch

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Citation for published version (APA):

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6 Word-final ambisyllabicity

6.1 Introduction

In the preceding chapters, we have come across two contradictory demands on syllable structure. The first is the claim that coda consonants have to be licensed and governed by a following onset (which in turn always needs to be licensed by a nucleus). The second demand is that lax vowels need to be followed by a tautosyllabic consonant. In the case of a lax vowel in a word-final syllable, the word-final consonant following such a vowel must occupy the onset position of an empty syllable \((CV_{lax}.C0)\) and it must follow the lax vowel in the same syllable \((CV_{lax}.C)\). The first demand is theory internally motivated (cf. Ch. 2), while the second follows from the special character of laxness (cf. Ch. 4).

Piggott (1999) argues that languages may differ in whether they do or don’t have word-final codas.\(^1\) Dutch is a language in which word-final consonants would supposedly be syllabified in onsets and not in codas, even in this view. An argument for this is that word-internal codas are more restricted than word-final consonants: coda consonants must have similar place specifications as the following onsets etc. As an alternative, we could take Polgárdi’s (1998) suggestion, that onset licensing is a violable constraint \(\text{(NUCLEUS)}\). This is not the position taken in this dissertation, as it would weaken the theory of representations in an undesirable way. Instead, it will be proposed that Standard Dutch has word-final ambisyllabic consonants, the first part of which occurs in the coda and the second part in the onset. This is not a weakening of the restrictive theory of representations, adhered to in this dissertation. Word-internally codas appear independently in languages; this implies that the theory has to deal with them and that nothing new has to be added.

In 6.2 I will state the problem. In 6.3 ambisyllabicity is considered: in 6.3.1 I will briefly review the arguments for the assumption that in Dutch lax vowels have to be followed by a tautosyllabic consonant and will go over the resulting effect of ambisyllabicity. In 6.3.2, arguments against the notion of ambisyllabicity will be discussed. An evaluation will follow in 6.3.3. Having defended the notion of ambisyllabicity in general, section 6.4 will be discuss word-final ambisyllabicity in Dutch, relating it to the topics of Final Devoicing and Stress. The chapter ends with an appendix, in which the subject of geminate inalterability as it has been treated in the literature, is discussed.

\(^1\) In Chapter 2 Piggott (1999) is briefly discussed.
6.2. The problem

As we will see below, Dutch phonotactics has motivated linguists to assume ambisyllabic, phonetically non-geminate consonants for Dutch. In (1) some examples from Tilburg Dutch are given. Words with a short, lax vowel in the nucleus are ungrammatical when there is no consonant following it in the same syllable. In (1) CV<sub>tono</sub>C and CV<sub> lax</sub>C are acceptable in syllable final position contrary to the last items in each row, which consist of *CV<sub> lax</sub> only.\(^2\)

(1) a. dɔk  ‘dock’
    dok  ‘idiot, softy,’
    *dɔ

b. spɛt  ‘regret’ (3 s.)
    spɛt  ‘regret’ (noun)
    *spɛ

c. lɔx  ‘cumbersome’
    lɔɣ ‘layer’ (pronounced as lɔx)
    *lɔ

    bɔd  ‘offer’ (pronounced as bɔt)
    bɔt  ‘benefit’

If we follow Van der Hulst (1985) in his proposal that lax vowels have to be followed by a tautosyllabic consonant word-finally, an impossible GP structure would be the result. That is, Dutch phonotactics argues for a structure with a consonant following the lax vowel in the same syllable, as in (2).

(2) O R
    |   |
    | N |
    x x x
    |   |
    d o k

The structure in (2) is fine as far as Dutch phonotactics is concerned. However, it is an unacceptable word-final structure in GP. Because of licensing requirements in

\(^2\) It is difficult to find examples with a word-final vowel – whether tense or lax – because of the already mentioned Final-C constraint. For Standard Dutch we could contrast /la/ ‘drawer’ and /la/ ‘cowardly’ with */la/. In the case of Tilburg Dutch we can only compare the grammatical syllable-final CV<sub> lax</sub>C with the impossible *CV<sub> lax</sub>. \(^2\)
GP theory the word-final consonant must be in an onset, licensed by a following empty nucleus, as can be seen in (3).

(3) O R O R
    | N N |
    x x x x
    d o k

(2) and (3) show structures which are required by Dutch phonotactics and GP theory respectively and which appear incompatible. As a solution to this dilemma I propose that the word-final consonants follow a lax vowel in the same syllable and are in the onset of a following empty rhyme. I thus suggest that in such a word-final syllable, a short, lax vowel is always followed by an ambisyllabic consonant, i.e. by a single elemental complex linked to two skeletal positions in two different syllables. The phonological structure of such an ambisyllabic final consonant is that of a geminate consonant. It belongs to the same syllable as the preceding short lax vowel and to the following syllable. Phonetically, consonant-length does not occur in Dutch as a result of which a geminate consonant is phonetically interpreted as a single consonant (cf. Borowski et al 1984, van der Hulst 1985). The proposed phonological representation of the words in question can be found in (4).

(4) O R O R
    | N N |
    x x x x x
    d o k
    sp e t
    l o x
    b n d

In (4) the word-final consonant occupies the coda position in the first syllable as well as the onset position in the second one. It belongs to both syllables at the same time. For words with tense or long, lax vowels in the final syllable this difficulty does not arise. Tense or long, lax vowels do not need to be followed by a tautosyllabic consonant. Consequently, the GP view that word-final consonants are always in the onset does not entail difficulties in this respect. Compare (4), in which the phonological structure of a word-final syllable with a lax vowel is represented, with (5a) and (5b) in which the structure of a word with a tense vowel and the structure of a word with a long, lax vowel in a word-final syllable are represented.
In (5) the final consonant occupies the onset of the final (empty) syllable, just as in (4). However, in (5) this constitutes no problem because there is no short, lax vowel demanding to be followed by a tautosyllabic consonant.

6.3.3 Ambisyllabicity

6.3.1 Arguments in favour of ambisyllabicity in Dutch

As we have observed in Chapter 4, the question of whether tenseness or vowel length is the phonological characteristic which distinguishes the group of phonetically long/tense vowels from short/lax vowels in Dutch, has been discussed since the 1930s. One of the differences between these two groups concerns phonotactics: short, lax vowels can be followed by one or two non-coronal consonants word-finally, and by one consonant word-internally, while long, tense vowels can be followed by no consonant at all word internally and by maximally one non-coronal consonant word-finally. Another difference is the fact that phonetically long, tense vowels have to occur in an open syllable word-internally, while short, lax vowels do not occur in an open syllable. This last point becomes clear when we look at the examples in (6).

(6)  hi.at  *hit.at  ‘hiatus’
    xa.cos  *xu.cos  ‘chaos’
    kre.ol  *kre.ol  ‘creole’

Van der Hulst (1985:60)
The fact that /hi.at/ in (6) is a perfectly acceptable Dutch word, whereas */hi.at/ is not, demonstrates that syllables may not end in a short, lax vowel. This suggests that words such as /kusa/ ‘cash register’, /moto/ ‘motto’ or /hebo/ ‘to have’ are syllabified in such a way that the first syllable does not end in a short, lax vowel, otherwise the ungrammaticality of */hi.at/ is unexpected. However, the Maximal Onset Principle does not allow a syllabification in which the medial consonant occupies the coda of the first syllable and not the onset of the second one (e.g. */kəs.a/). An ambisyllabic representation in which the medial consonant occurs in the coda of the initial syllable and in the onset of the final one, is therefore preferable.

Van der Hulst (1985) argues that the facts of Final Devoicing point in the same direction: ambisyllabic consonants word-medially are not subject to the powerful Final Devoicing constraint. He argues that in a word such as /hebo/ [b] is voiced which is unexpected if it occurs in the coda of the first syllable only. In such a case, we expect to find [p] instead of a [b] because of Final Devoicing. Van der Hulst’s third argument to syllabify words such as /kusa/ as CVC.CV is stress assignment. He refers to trisyllabic words the final two syllables of which have the same phonological structure as /kusa/, e.g. /dilema/ ‘dilemma’ or /programma/ ‘program’. Like /kusa/, these trisyllabic words have a short, lax vowel in penultimate position. The interesting thing is that these trisyllabic words have the same penultimate stress pattern as words like /wa’randa/ ‘veranda(h)’ and /a’genda/ ‘diary’. In both cases the penultimate stress is caused by the fact that a pre-final VC syllable is always stressed in Dutch (dialects). This in turn implies that in words such as */kasa/ and in words such as /di’lema/, the pre-final syllable consist of a CVC syllable (/kʊs/ and /lɛm/, respectively), because of which the syllable in question receives stress.

As far as the structure of the ambisyllabic consonants is concerned, Van der Hulst (1985) as well as Borowski et al (1984) give three possible representations for words such as Dutch /kusa/ ‘cash register’. These are given in (7).

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3 See below where I will claim that for word-final ambisyllabic consonants the situation is different.
4 Final Devoicing – the constraint that syllable-finally all obstruents are voiceless – is almost without exception in Dutch dialects. Later in this chapter I will discuss this subject and its connection to ambisyllabicity thoroughly. For now it suffices to say that obstruents in coda position cannot be voiced.
5 I refer to section 6.4.2. in this chapter for a discussion of some problems related to this aspect of stress.
In (7a), the segmental material /s/ and the skeletal slot x belong to two syllables. This representation is similar to the one found in Kahn (1980) for a word such as English *hammer* /hæmər/. According to Kahn, such a word is initially syllabified with the /m/ in the onset of the second syllable, while a later rule introduces a connection between the first syllable and the medial consonant (cf. Kahn 1980). I consider (7a) to be an unacceptable structure because it implies that a single segment – that is, segmental material and skeletal point – belongs to two constituents at the same time, which is a case of improper bracketing (Harris 1994). The structure of (7b) shows the same segments (segmental material and skeletal position) in adjacent positions. Such a structure is undesirable since it implies a violation of the OCP, at least when these parts of the long geminate are intra-morphemic (Harris 1994). Following Borowski (1984) one can imagine that such a structure is appropriate if
the two parts of the long geminate belong to separate morphemes. In the case of Dutch phonetically long, geminate consonants do not even occur in compounds (kas-sla ‘lettuce from the greenhouse’ is [kuɡla] and not *[koʊsla]). Consequently, I follow Van der Hulst (1985), who argues for the structure in (7c), in which ambisyllabic consonants have the same structure as geminates, that is, a structure in which the segmental material is attached to two skeletal positions each of which is linked to a different syllable. Whether the geminate is phonetically long depends on the language in question: in Dutch phonetic consonant length does not exist and as a consequence the geminate is phonetically short.

6.3.2. Arguments against ambisyllabicity

Arguments against ambisyllabicity can be found in Harris (1999). His arguments include theoretical objections and empirical observations. We will first consider the more fundamental, theoretical arguments.

In Harris’ view, the assumption of ambisyllabic, phonetically short consonants is both unnecessary and undesirable. According to the author, there is no sound representation for (short, geminate) ambisyllabicity. He argues that it is undesirable to assume that one consonantal segment belongs to two syllables. On the other hand, an analysis in which ambisyllabic consonants are represented as phonologically geminate consonants (phonetically interpreted as short and single) cannot be correct either. He argues that a language such as English demonstrates this. Medial consonants which are generally presumed to be ambisyllabic are subject to all kinds of weakening processes (e.g. flapping). This is in contradiction to the observation that geminates generally are inalterable and are not expected to be subject to weakening.

Another problem for the concept of ambisyllabicity is the following. Suppose, for a moment, that it is possible to find in a natural language ambisyllabic consonants which are phonetically long and ambisyllabic consonants which are phonetically short. Such a language would not be predicted by a theory of ambisyllabicity. As such, the existence of such a language would constitute a problem for the theory. According to Harris, such a language exists: Ibibio. This is why Harris proposes to abandon the concept of ambisyllabicity for phonetically short consonants and uses the foot as an explanatory device for the relevant data instead.

Harris demonstrates that the concept of the foot can account for all the facts which purportedly support the notion of ambisyllabicity. Having done so, he discusses neutralization in Ibibio in order to show that there are cases where the notion of ambisyllabicity is impossible to apply. Because in Harris’ view the case of

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6 However, see Vogel (1977), who claims that no language has a contrast between truly long, geminate consonants and ambisyllabic consonants.
Ibibio is proof of the superiority of a foot-based analysis over an analysis based on ambisyllabicity, the data from this language are discussed in some detail below.\(^7\)

In (8) the distribution of oral stops and related segments in Ibibio is given. In (9) we find some examples.

(8)

<table>
<thead>
<tr>
<th>Foot-initial</th>
<th>Non-foot-initial</th>
</tr>
</thead>
<tbody>
<tr>
<td>[C]</td>
<td>VCCV</td>
</tr>
<tr>
<td>kp</td>
<td>b</td>
</tr>
<tr>
<td>t</td>
<td>d</td>
</tr>
<tr>
<td>k</td>
<td>kk</td>
</tr>
</tbody>
</table>

(9) a. Foot-initial

kpá ‘die’

ba ‘exist’

Non-foot-initial:

b. díppé ‘not hide’

díṭe ‘hide oneself’

díp ‘hide’

The generalisations illustrated in (8), are as follows. Foot-initially there is a two-way laryngeal contrast among the labial and coronal plosives: plain versus prevoiced (9a). With the exception of the foot-initial site, the Ibibio system demonstrates neutralising pressure: there is no contrast between plain and prevoiced, as shown in (9b). Geminate stops are plain ([díppé]); non-geminate stops are subject to vocalisation when they occur before a vowel ([díṭe]) and are unreleased when word-final before a stop or pause ([díp’]). A confirmation of the necessity of the foot-based condition can be found in examples such as [i-(Foot)bá-(Foot)tá] ‘she is not coming’, where the /b/ is intervocalic but not lenited because it is foot-initial.

According to Harris there are striking parallels between lenition in Ibibio and lenition in Danish and English. The contextual and segmental details of tapping are more or less identical across these languages. Even though the context is intervocalic in both cases, tapping fails foot-initially but can be observed foot-finally, as can be seen in (10).

(10) a. No tapping of coronal obstruents foot-initially:

- English: bout(Foot)étique (‘boutique’)
- Danish: a(Foot)tom (‘atom’)
- Ibibio: u(Foot)tañ (‘plaiting’)

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\(^7\) Even though Ibibio, being a tone language, lacks stress, foot structure plays an important role in the domain of weight and as an organizer of segmental distributions.
b. Tapping of coronal obstruents foot-internally:

English: (\textsubscript{Foot}GER) Anne \quad (‘get Anne’)
Danish: (\textsubscript{Foot}SAER) \textit{op} \quad (‘set’)
Ibibio: (\textsubscript{Foot}BER) \textit{owo} \quad (‘push someone’)

(Harris 1999:1889, with some adaptations)

In the examples in (10a) the coronal obstruent /t/ is in foot-initial position. Consequently, it does not change into the lenited variant *[r]. However, in (10b) the coronal obstruent occurs foot-internally. Consequently, it lenites and can be transcribed as [r]. If one claims that in a language such as English (and Danish) tapping is the result of ambisyllabicity, one would have to say that in Ibibio these consonants are ambisyllabic as well. However, this is in conflict with the claim that no language will contrast single ambisyllabic consonants with true long geminates. While the single consonants in Ibibio are subject to lenition, the geminates remain unalterable. In (11) below, the velar and labial obstruents lenite when single ([γ] and [β], respectively) but remain unaltered when they are geminates ([kk] and [pp], respectively).

(11) Ibibio geminate consonants

\begin{itemize}
  \item f\textsubscript{uk} ‘wedge’
  \item fa\textsubscript{y}a ‘not wedged’
  \item f\textsubscript{k}ka ‘remove wedge’
  \item d\textsubscript{ip} ‘hide’
  \item d\textsubscript{ibe} ‘hide oneself’
  \item d\textsubscript{ep}pe ‘not-hide’
\end{itemize}

The case of Ibibio is a clear demonstration of the fact that the head of a foot can support more elements than dependent positions. It is an example of a language in which we only need to refer to different locations within the foot in order to be able to characterise the prosodic conditions on each of the regularities (that is, the different occurrences as plain, prevocalic or lenited consonants) in question. In foot-initial position the consonant is unaltered: it is the strongest position and consequently is occupied by a strong segment. The non-foot-initial position is a weak position and can support fewer elements – weaker segments – than a strong, foot-initial position. This is why in non-foot-initial positions we find lenited or weakened consonants.

The case of Ibibio is a strong argument against ambisyllabicity in Harris (1999). A language with true geminate consonants and ambisyllabic, phonologically geminate but phonetically single, short consonants, would constitute a serious problem for ambisyllabicity. As a matter of fact, if the analysis of Ibibio by Harris were the only possible one, this language would constitute a serious problem for the notion of ambisyllabicity. For this reason, it is of considerable importance to examine this language and Harris’s analysis in more detail. We will see that Ibibio does not constitute a counterexample, if the analysis is changed slightly. This will be demonstrated in the next section.
6.3.3. Discussion of ambisyllabicity

The head position of a foot can support more elements than a dependent position. However, I will argue that for the analysis of Dutch the concept of the foot is not sufficient. We do need ambisyllabicity, in the sense of Van der Hulst (1985) among others and contrary to what is suggested by Harris. I will demonstrate that in Dutch, in an identical prosodic (foot-internal) context, we find phonetically identical consonants with phonologically distinct behaviour. The only relevant difference is that the vowel preceding the foot-internal consonant is phonologically tense in one case and lax in the other.

First of all we briefly discuss Harris’ fundamental criticism that the assumption of ambisyllabic consonants would weaken the theory. I argue that ambisyllabicity does not weaken the theory because nothing extra is needed to represent it. As a matter of fact, it appears that the representational apparatus we need for ambisyllabic consonants is already present. Partial geminates in coda-onset clusters are frequent cross-linguistically and their representation is not in any fundamental way different from the representation of an ambisyllabic consonant. It has been argued in Chapter 3 that one of the reasons coda positions are present at all, is that a lax nuclear head on its own is not strong enough to license a following dependent rhyme. Consequently, a coda consonant is present in order to provide the lax nuclear head with enough licensing strength. This is true, irrespective of whether the coda is occupied by a partial or a complete geminate. In both cases we assume that the coda position gets its autosegmental licensing potential from the onset. Since its potential has diminished when going from one position to another, the coda may only autosegmentally license material which is completely or partly shared with the following onset.

Let us consider the following representation of the Dutch word *ander* /ʌndɔr/ ‘other’ in (12).

(12)  R          R  R  
 |           |  |  |  |
O N O N O  x x x x x x
| | | | |  |
A ? ? @ R

The representation of the Dutch word *adder* /ʌdɔr/ ‘viper’, with an ambisyllabic consonant, is structurally exactly the same, except for the fact that not only the coronal place element R, but all elements are shared between coda and onset. This is demonstrated in (13).
The representations in (12) and (13) do not differ structurally. In both cases, the segmental structure – the elements of the first coda and onset positions – belongs to two positions. In both cases the lax nuclear head forces a coda position to be present. That is, codas are undesirable positions but whether they are filled with same of different material as the onset does not matter.

In the second place, Harris argues that ambisyllabicity is not a necessary concept. Instead, he favours a foot-central approach. For him, lenition, vocalisation and other weakening processes are consequences of the foot-internal status of the targets: foot-internal positions are weak and do not allow the same amount of elements/features as strong positions do. It will be demonstrated here that we cannot do away with ambisyllabicity in Dutch. In Dutch, ambisyllabicity has to be represented as gemination phonologically, even if the ambisyllabic consonant is phonetically single and short. Let us consider the data in (14).

(14) a. ˈrodəɾ  / ˈrojəɾ  ‘more red’
      ˈladəɾ  / ˈlajəɾ  ‘to load’

versus:

b. ˈmədəɾ / *ˈməjəɾ  ‘mud’
    ˈlədəɾ / *ˈləjəɾ  ‘ladder’

The question is why lenition occurs in the examples in (14a) and not in (14b). I suggest that the answer is that a single, word-internal consonant is in the foot-internal onset position in (14a) whereas the word-internal consonant is ambisyllabic in (14b). In (14b), the ambisyllabic consonant occurs in the coda consonant of the first syllable and in the foot-internal onset of the second syllable.
We will first consider the representation of the lenited variant of /redə/ [reja] ‘drew (plural)’ in (15).\(^8\)

\[
\begin{array}{c c c}
\sigma & \sigma \\
\hline
/ & O & R \\
/ & O & R \\
\hline
N & N \\
x & x & x \\
\hline
r & e & j & o
\end{array}
\]

In (15), [j] - I in elemental terms - is in a weak, foot-internal onset position. Consequently, only a simplex segment, consisting of I, is licensed. In the representation of [redə] redden ‘to save’ in (16), the [d] is ambisyllabic. It occurs in the coda and in the onset position. The [d] in the foot-internal onset position is subject to conflicting requirements. On the one hand, it may not contain a great deal of elemental material because of its weak position, and on the other hand it must contain enough elemental material to license the material in the coda position. This is why a glide such as [j] is impossible here: [j] does not contain enough material to license [d] in the coda of the first syllable. Since the element I prefers not to occupy a coda position and since there is nothing wrong with the ambisyllabic [d] in the coda, everything stays as it is.\(^9\)

\[
\begin{array}{c c c}
R & O & R \\
\hline
N & N \\
x & x & x \\
\hline
r & e & d & o
\end{array}
\]

Comparing this with Harris’ analysis of the English data, we could argue that the fact that the /t/ in /pəti/ is subject to lenition makes an ambisyllabicity analysis improbable for English. This is not the case with ‘modør/ or ‘lədør/ in Dutch. Part of the problem may lie in the fact that English words such as [pəti] are assumed to contain an ambisyllabic consonant. If such English forms contained geminate

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\(^8\) The fact that /d/ weakens to [j] argues for a different representation of /d/. If /d/ is represented as (h, R, ?, L) we do not expect it to weaken to /j/, which consists of only I. See for instance Scheer (2002) for literature against the element R. Scheer also mentions arguments in favour of the presence of the element I in for instance the consonants /h/ and /l/.

\(^9\) In Chapter 3 I have demonstrated that the element I prefers not to occupy a coda position.
consonants, this could result in the strange situation where these consonants are subject to change, contrary to the universal observation that geminates are inalterable. However, if words such as /pti/ are analysed as /pt.ti/ and not as /pt.ti/, forms such as [prí] or [prí] are expected to occur. Thus, I propose that Dutch /'mədər/ has an ambisyllabic /d/ intervocically, whereas words such as English /'pti/ do not have an ambisyllabic /t/ word-medially (and can therefore be represented as /pt.ti/). Consequently, Dutch /'mədər/ is structurally represented as /məd.dər/ - with two consonantal positions linked to one segment. Dutch /'rojər/ on the other hand has the same structure as English /'pti/.

Therefore, [rojər] may occur next to [rojər], just like [pti] appears alongside [prí] (or [prí]), depending on the variety.

In the appendix, a discussion of inalterability can be found. This concept has been discussed on several occasions in the literature since the 1980s. Van der Hulst (1985) mentions inalterability as an argument for the lack of Final Devoicing in ambisyllabic consonants. Harris (1999) uses it in his argumentation against ambisyllabicitity. This discussion is not part of the main text because inalterability of ambisyllabic consonant is not a problematic issue in the framework of head-dependency or licensor/licensee and the concomitant distinction in licensing potential. The view adhered to in this dissertation on Geminate Inalterability, is stated by, among others, Goldsmith (1990) and Harris (1990, 1994). Goldsmith states that rules discussed in the literature under the rubric of inalterability and integrity apply to non-geminates in order to achieve compliance to word-level phonotactics. Geminates do not violate phonotactics because of licensing considerations. As geminates are associated with a coda position and an onset position, they get their licensing from the onset position. Therefore these geminates allow for the presence of segmental material in the coda that otherwise would not have a chance of appearing there.

Summarising, we have observed that, in the examples in (14), foot-structure appears to be the same in all cases. There is no way we can account for the fact that lenition is possible in the tense-vowel cases while this is impossible in the lax vowel cases on the basis of foot-structure alone. In this sense there is an important difference between English and Dutch: in Dutch we find VCV contexts where the C

10 In Ibibo the phonological situation is similar to that of Dutch: intervocally and foot-internally we find lenited consonants (such as in [foˈːjə] ‘not wedged’ (from /fʊkə/ ‘wedge’)) as well as non-lenited, ambisyllabic ones, such as in [fʊkkə] ‘remove wedge’. [foˈːjə] can be assumed to have a similar structure as Dutch [rojə], whereas [fʊkkə] and [mədər] ‘mud’ resemble each other. The only difference in this respect between the two languages is that in Ibibo consonants can be long phonetically, whereas in Dutch plosives do not support phonetic length (intervocalic voiceless fricatives are however longer than their voiced counterparts (cf. I. Slis & M. van Heugten 1989).

11 The view that well-formedness constraints/phonotactics have a lot to do with the so-called geminate inalterability can also be found in Scobbie (1992).
appears to be lenited and VCV contexts where the C is not lenited. Consequently, we cannot do away with ambisyllabicity for the analysis of Dutch.

If Dutch words with a lax vowel in the final syllable end in an ambisyllabic consonant and if this consonant is a geminate, the word-final consonant is expected to behave accordingly. In the next section it will be demonstrated that word-final ambisyllabic consonants in Dutch behave in the same fashion as word-internal ambisyllabic consonants.

6.4. Word-final ambisyllabicity

There are two major problems attached to the proposal that word-final syllables with lax nuclear heads end in ambisyllabic consonants. One of these problems has to do with Final Devoicing. This will be discussed in 6.4.1. The second problem is related to the subject of stress. If word-final ambisyllabic consonants occur, we have to account for the fact that these word-final syllables are not always stressed in contrast with the situation word-internally. This topic will be discussed in 6.4.2. Before going into a discussion of possible problems attached to the analysis, we will go back to the analysis itself.

The structure of words such as [bot] ‘offer’ and [bet] ‘bed’ is proposed to be as in (17).

(17) O R O R  
    N   N   
   x x x x x  
    \ \ /  
     b  d  

In (17) the lax vowels are followed by an ambisyllabic consonant, that is, by a single elemental complex linked to two skeletal positions and belonging to different syllables. The phonological structure of such an ambisyllabic, final consonant is that of a geminate consonant: it belongs to the same syllable as the preceding short, lax vowel and to the following empty syllable. Phonetically, consonant-length is not relevant in Dutch as a result of which such a geminate consonant is phonetically interpreted as a single consonant. We will now consider why Final Devoicing applies to word-final ambisyllabic consonants while it does not when the ambisyllabic consonants are word-internal.

6.4.1. Final Devoicing

Final Devoicing is a characteristic property of Dutch and Dutch dialects including Tilburg Dutch. It can be clearly observed in singular/plural pairs, with most obstruents in Standard Dutch as well as in Tilburg Dutch. Some examples are presented in (18).

(18) a. Standard Dutch:

| (ik) les - (wij) lezo | ‘(I) read - (we) read’ |
| rof - rovø | ‘burglary - to steal’ |
| meit - meidø | ‘girl - girls’ |
| (ik) tøp - (wij) tøbø | ‘(I) worry - (we) worry’ |

b. Tilburg Dutch:

| bet - bêdø | ‘bed - beds’ |
| met - meðø | ‘maid - maids’ |
| tk hep - wej hebø | ‘I have - we have’ |
| tk bløf - wej blø:vø | ‘I stay - we stay’ |

In all these cases, a correspondence can be observed between a voiced obstruent in intervocalic position and a voiceless one in a word-final position. This phenomenon is without exceptions.

Féry (2003b) mentions two approaches to Final Devoicing in the literature. First of all, she discusses an approach in which it is argued that the fact that obstruents are in the coda, is responsible for their neutralization. In the second place she mentions the onset-based approach of Lombardi, who claims that obstruents can only be voiced before tautosyllabic sonorants (Lombardi 1991, 1995).

(19) σ

/ \  
[root] +son
 |
Laryngeal node

(Lombardi 1995)

(19) states that obstruents may only be voiced before a tautosyllabic sonorant. Consequently, an obstruent in any other context will be voiceless, also if the obstruent is voiced underlyingly. In the remainder of this chapter, I will adopt Lombardi’s approach to Final Devoicing.

In (20), we will consider the relevant examples from (18) - words ending in an underlying voiced obstruent (obvious from the fact that in the plural form, the relevant consonant is voiced).
Structurally, the words in (20) do not end in a syllable-final consonant, but in an onset-consonant, followed by an empty nucleus. Furthermore, as proposed in this chapter, the forms with a short, lax vowel in their final syllable end in an ambisyllabic consonant. Consequently, the word [bEt] ‘bed’ has the structure in (21).

(21)  
[bEd.d0] ‘bed’ (cf. [mEù.d0] ‘maid’, if the lax vowel is long)

The fact that in a word such as [mEùt], structurally /mEù.d0/, Final Devoicing takes place, is not surprising because the final consonant is not followed by a tautosyllabic sonorant. On the other hand, with word-internal ambisyllabic consonants no devoicing takes place. I have accounted for this fact by claiming that such a devoicing of the coda consonant is not necessary because the structure is optimal, the coda position being licensed by the following onset; this onset is in turn followed by a vowel and consequently it is expected to be voiced. More complicated is the answer to the question as to why in [bEt], a word with a structure such as /bEd.d0/, the final consonant is devoiced?

The analysis is somewhat complicated, because different, sometimes contradictory, forces are at work. In (22), I give examples with tense and lax vowels before word-final ambisyllabic consonants. In each case a similar form with a word-internal ambisyllabic consonant is given as well.

(22) a. consonants following tense vowels:

<table>
<thead>
<tr>
<th>word-finally</th>
<th>word-internally</th>
</tr>
</thead>
<tbody>
<tr>
<td>/ro. d0/ [rot] ‘red’</td>
<td>/ro.dør/ [roðør] ‘more red’</td>
</tr>
</tbody>
</table>

b. consonants following lax vowels:

<table>
<thead>
<tr>
<th>word-finally</th>
<th>word-internally</th>
</tr>
</thead>
<tbody>
<tr>
<td>/bod.d0/ [bot] ‘offer’</td>
<td>/mod.dør/ [mɔðør] ‘mud’</td>
</tr>
</tbody>
</table>

The situation of the final consonant in /rod/ [rot] in (22a) is straightforward. The /d/ is followed by an empty nucleus which is not a sonorant by definition. Therefore the coronal obstruent is voiceless in syllable-final position. If we compare this with /ro.dør/ [roðør], there are no difficulties. Following Lombardi’s constraint (cf. 19), obstruents are voiced before a tautosyllabic sonorant. As schwa is a sonorant, the obstruent is thus voiced: [d].

We will now turn to the more interesting case of lax vowels in a word-final syllable, as in (22b). Consider first the polysyllabic word /mOd.dør/ [mɔðør]. In this case the obstruent in the onset is voiced, [d], because it is followed by a tautosyllabic sonorant. The fact that the coda segment is not devoiced, is because there is no need
to. Its licensing power depends on the following onset and it can remain as it is, in spite of the fact that it is in a prosodically weak position. There is no need for it to change.

The most complicated situation is found in /bɔd.d0/, which is [bɔt] phonetically. Why should the ambi syllabic consonants alter (/d/ versus [t]) if an ambi syllabic consonant in the coda position is already an optimal situation. The solution lies in the fact that the cluster is subject to conflicting demands. On the one hand, the obstruent in the onset should be voiceless, because there is no sonorant following it (only an empty nucleus). On the other hand, the coda, being a prosodically weak position, may hardly license any material of its own. In (23) a representation is given of what such a form would look like if the second part of the ambi syllabic geminate were voiceless - satisfying Lombardi’s constraint (cf. 19) - while the first part would remain as it is (just as it does in /mɔd.dɔt/ [mɔdɔt]).

(23) *bɔd-t0

In (23), the word-final consonant is voiceless because it is not followed by a sonorant. The resultant structure is undesirable. Because of their prosodically weak status, coda positions cannot license more material than the material occurring in the following onset. If the onset devoices - as it should, according to the definition of Final Devoicing - it has less elemental material than its preceding coda. Therefore the optimal outcome is [bɔt], a form in which the coda obstruent adapts to the fact that its licensing onset cannot bear voice. This way, not only is the demand that lax vowels must be followed by a tautosyllabic consonant satisfied (/bɔd.d0/), but also the demand that word- and syllable-final consonants structurally occur in the onset of an empty nucleus (/bɔd.d0/).

It is interesting to note that a similar proposal was made by Spa (1970). He suggests comparable lexical representations for the following singular-plural word-pairs in Standard Dutch in (24).

(24) [wɛp] [wɛbɔn] ‘web, webs’ /wɛbb/
[pat] [padɔn] ‘toad, toads’ /padd/

(Spa 1970:198-9)

His analysis was presented in another framework, with different mechanisms but the principle is the same. As corroborating fact he points at adjacent consonants, such as two /n/’s in adjacent words, which are reduced to one [n], just as two /d/s or two /b/s are reduced to one [d] or [b] in (24).13

13 Standard Dutch has interesting word pairs such as [pət], [padɔn] (‘path, paths’) and [pat], padɔn] (‘toad, toads’). As the lexical representation of ‘path’ Spa gives /pad/, while the lexical representation of ‘toad’ is /padd/. The first representation would be problematic for me, since /pad/ is an impossible structure, for the reasons given above (lax vowels need a tautosyllabic consonant, while word-final consonants structurally occupy a final onset
Before concluding the section on word-final ambisyllabicity, I need to discuss one other important issue: the apparent stress difference between words which structurally end in an ambisyllabic consonant and words which end in two distinct consonants.

### 6.4.2. Word-final ambisyllabicity and stress

Van der Hulst (1985) argues that stress facts indicate that in words such as *dilemma* the *m* must be ambisyllabic. It has the same stress pattern as words such as *agenda*, in which the *n* is clearly in the coda of its syllable. An analysis along these lines implies that syllables ending in an ambisyllabic consonant must always be stressed. However, this does not appear to be the case. On the contrary, it is often claimed that syllables with a lax vowel and two non-identical consonants are most often stressed, whereas syllables with a lax vowel and a single consonant – syllables ending in anambiysllabic consonant in my proposal – are not.

In the analysis I propose in this chapter, final syllables with lax vowels and a phonetically single final consonant structurally end in an ambisyllabic and therefore *geminate* consonant. Accordingly, the analysis proposed here predicts that, just as words such as /aˈgɛn.dəl/ and /diˈlɛm.ma/ (‘diary’ and ‘id.’) behave similarly as far as stress is concerned, words with a final syllable with a lax vowel followed by two distinct consonants, behave in the same way as words with a final syllable with a lax vowel followed by a phonetically single consonant. If this is not the case, it constitutes a problem for my analysis. Let us consider the stress facts more closely.

First of all, I consider some bisyllabic Standard Dutch forms. We find many words with a tense vowel in the first syllable and a word-final syllable with a lax vowel and a consonant. Of these bisyllabic monomorphemic words, 190 have word-initial stress, against 120 with word-final stress.\(^\text{14}\) This is illustrated in (25) and (26).

<table>
<thead>
<tr>
<th>Vowel Pattern</th>
<th>Initial Stress</th>
<th>Final Stress</th>
</tr>
</thead>
<tbody>
<tr>
<td>VC-VC</td>
<td>140</td>
<td>90</td>
</tr>
<tr>
<td>VV-VV</td>
<td>170</td>
<td>60</td>
</tr>
<tr>
<td>VC-VV</td>
<td>170</td>
<td>30</td>
</tr>
<tr>
<td>VV-VC</td>
<td>190</td>
<td>120</td>
</tr>
</tbody>
</table>

\(^\text{14}\) Van der Hulst (1984:218) gives the following table to indicate the four stress types, attested in Dutch bisyllabic, monomorphic words (tense vowels are labelled long – VV).
If these words really have the same structural representation as words such as *dilemma* - which is the claim made in this chapter - why don't they all have final stress? Why don't they all behave such as /ka’raf/ in (26)? It appears to be the case that trisyllabic words, with a penultimate VC syllable, almost always have stress on the penultimate syllable in words with distinct coda-onset consonants and in words with ambisyllabic consonants. However, for reasons, which I do not understand, the pattern is not so uniform in bisyllabic words. In (25), examples are given of words which, according to the ‘final ambisyllabic consonant’ analysis presented in this chapter, end in an ambisyllabic consonant but which, in spite of this, have initial instead of final stress. However, the same exceptions can be found with words ending in *distinct consonants*. In (27), some examples are given of words which end in a consonant cluster and which have, in spite of this, initial stress.
This indicates that it is not so much a question of whether the two consonants under discussion are the same or different (phonetically single or consisting of a consonant cluster) but whether they occur in a bisyllabic or trisyllabic word, or more specifically, whether they occur in a final or non-final syllable. This might be caused by the stress ‘rules’ themselves. On the other hand, it might have to do with the question of whether the nucleus following the consonants is filled or not.

Another interesting point is raised in Davis (1999). Davis discusses cases in which geminate coda-consonants behave differently from single coda-consonants in the same language. He refers to Hausa, a language in which syllables closed by homorganic nasals behave unlike syllables closed by a geminate consonant. No remark is made in this work about the relevance of the number of syllables, but this would be worth looking at in future research. The problem with regard to the difference in stress between ambisyllabic and distinct consonants in final and pre-final syllables, will be put aside for now.

6.5. Conclusion

One of the aims of this chapter has been to demonstrate that the decision to stick to a restrictive theory and to analyse ‘problematic’ data within the framework, leads to interesting results. In Chapter 4, I have provided arguments for the view that lax vowels have to be followed by a tautosyllabic consonant. In Chapter 2 I have given arguments for the GP analysis of a phonetically word-final consonant as a consonant in the onset of an empty nucleus. I have shown that for (Tilburg and Standard) Dutch we may assume that phonetically word-final consonants following lax vowels structurally occur in the onset of an empty syllable. Such a proposal has already been made for such consonants when they follow tense vowels (cf. Oostendorp 2000 and Zonneveld 1993). We now have a similar analysis for phonetically word-final consonants following tense and lax vowels. Note that there is nothing special or extra needed for the analysis proposed here.

In this chapter, arguments have been presented for the concept of ambisyllabicity as a phonological structure of two geminate consonants and a phonetic structure of a single one. Ambisyllabicity is not a notion which is generally accepted. Arguments against it can, for instance, be found in Harris (1999). In favour of ambisyllabicity, I have argued that an ambisyllabic structure does not add anything to the theoretical apparatus already present. Furthermore, there are languages, such as Dutch, which cannot do without it. I have suggested that part of the problem with ambisyllabicity might be due to the fact that English word-medial consonants are considered to be ambisyllabic. In this chapter it is claimed that this is a misconception. The usefulness of a GP framework in which the difference between heads and dependents with respect to licensing is so important, is evident. Ambisyllabicity, as a general concept, is understandable from the idea that segments in coda positions cannot license as much elemental material as segments in onset positions. Coda positions are licensed by the following onset positions; codas are dependent and the following onsets are heads. The analysis follows logically from this difference.
In the appendix below, an overview on the subject of inalterability is given, although I do not pretend that it is complete. This discussion is not part of the main text because inalterability follows directly from the licensing differences between phonological heads and dependent positions. Since there is a large body of literature on the phenomenon of geminate inalterability (some of which may be considered to be important predecessors of more recent viewpoints), I have decided not to leave out an overview of this literature completely and to present some important views in the following appendix.

Appendix: inalterability

Inalterability has received a lot of attention in the literature – even more so than the related subjects of ambiguity and integrity, even though all three subjects are generally considered to be relevant for geminates. In this chapter, inalterability has not been treated as a special characteristic of geminates. Inalterability is a mere consequence of the already optimal structure of geminates.

Van der Hulst (1985) uses the characteristic of inalterability to account for the fact that Dutch Final Devoicing, which generally occurs with coda consonants in the language in question, does not occur with ambisyllabic consonants. According to Van der Hulst (referring to Hayes 1984), this is caused by a property typical of long segments: inalterability. Inalterability accounts for the fact that in a word such as Dutch hebben ([hebən]) the /b/ is not subject to Final Devoicing (Van der Hulst 1985:60).

Borowski, Itô and Mester (1984) show that, in Danish, word-medial consonants have coda- and onset properties. Just as in Dutch, Final Devoicing does not occur with these ambisyllabic consonants, in the same way, in Danish, a rule such as Consonant Gradation (making underlying voiceless consonants voiced, and voiced consonant spirants) does not occur in that context. Borowski, Itô and Mester argue that the reason behind this is that these ambisyllabic consonants are geminates, satisfying the Geminate Constraint (‘No rule can apply to the melody element of a geminate structure unless both skeleton positions fulfil the structural description of the rule’).

Inalterability is also discussed in Hayes (1986a, b) and Schein & Steriade (1986). These authors claim that, in principle, only geminates are subject to inalterability and that this is due to their special structure. They refer to the principle of Strong Satisfaction, which states that geminates do not alter through the working of a rule, if that rule does not mention the entire structure or all of the association lines of the geminate. To account for the inalterability in the ambisyllabic ‘case’, Hayes uses the so-called Linking Constraint (‘Association lines in structural descriptions are interpreted as exhaustive’ (Hayes 1986b:472)). That is, when a rule must contain association lines in its structural description, that rule only affects those

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15 Ambiguity means that long segments act in some contexts as if they were two segments, in others if they were one; Integrity means that, insofar as they constitute two segments, long segments cannot be split by epenthesis (Hayes 1986a:321).
forms in which the association lines match up exactly. The rules subject to inalterability are those which mention both the CV or skeletal tier and the melodic tier; those rules which escape inalterability are formulated on just one tier. This is not because two tiers are mentioned but because of the association lines mentioned in the structural descriptions of the rules. An example of this is Persian v-weakening. In Persian, /v/ weakens to [w] when it follows a short vowel in the same syllable, as may be seen in (28).

(28) Persian v-weakening bo-row (<bo-ʁæv)₁⁶ ‘go!’

\[\sigma
    / \V C
    v \to w / \]

This rule does not apply to geminates (/ʁvʁ/ ‘first’ */ʁwʁl*/[owrl]). According to Hayes (1986a), this is the case because the association lines of the /v/ melody exceed those permitted by the Linking Constraint (in the rule the v-melody is linked with one association line to a consonantal position, whereas in the actual form there are two association lines).

According to Schein & Steriade (1986), the association lines are not the clue, as Hayes suggests; what counts is that a rule cannot apply to a geminate when part of the linked structure of the rules target fails to meet a structural description. They call this the Uniform Applicability Condition (UAC):

Uniform Applicability Condition (UAC)
Given a node n, a set S consisting of all nodes linked to n on some tier T, and a rule R that alters the contents of n: a condition in the structural description of R on any member of S is a condition of every member of S
(Schein & Steriade 1986:727)

A short example will illustrate this. In Tigrinya an obstruent is spirantised if it follows and is adjacent to a syllable nucleus. Accordingly, all postvocalic velar or uvular stops turn into spirants (indicated by underlining of the segment), as is demonstrated in (29).

(29) mə-ʁtæk ‘to cut’

A formalisation of Tigrinya Spirantisation can be found in (30).

₁⁶ ae > o before w
X₂ is adjacent to X₁.

In (30) a [+back] obstruent (in X₂) is spirantised when it directly follows a nuclear position. Spirantisation is subject to geminate blockage, as is illustrated in (31).

(31) fäkkärä 'boasts'

Spirantisation is blocked in (31) because of the condition that a member mentioned in the rule, is adjacent to a nuclear position. By the UAC this condition must be met by every member of the set. However, of a geminate only one part can be adjacent to the nuclear position. Therefore, the rule is blocked and geminate /k/ does not change.

Even though the analyses of Hayes (1986a, b) and Schein and Steriade (1986) differ on some points, they agree in the sense that, in both analyses, the underlying representations and their relation to the rule in question are crucial. If these do not match, the rule cannot apply. One of the important questions, even if these analyses could work in all cases, would be why this is the case. Why must association lines strictly match? Why must structural descriptions of rules and representations match in such a strict fashion (cf. Scobbie 1992 for a critical discussion of Strong Satisfaction)? What are the essential factors, determining inalterability, besides the technical aspects of association lines and matching or non-matching structures?

Selkirk (1990a) holds a slightly different view: she suggests that a rule does not apply if its output is not well-formed. Her view is therefore in some sense principally different from those just discussed, in that the emphasis is placed on output wellformedness. Selkirk discusses the subject of inalterability of geminates using a framework in which the length of geminate consonants and vowels is represented within segment structure. That is, geminate entities involve two root nodes and some amount of shared feature specification, such as, for instance, the representation given in (32).

(32) Geminate Consonants

| Root | Root |
| +cons | +cons |
| -/+son | -/+son |

\ / \\
Place
In her opinion, inalterability is a consequence of a wellformedness constraint on phonological representations. That is, it is a constraint prohibiting multiple linking in feature structure. The Multiple Linking Constraint therefore prohibits structures such as the one in (33).

\[(33) \begin{array}{c}
\ast \text{Root} & \text{Root} \\
-\text{cons} & +\text{cons} \\
+\text{son} & +\text{son} \\
\backslash / \\
\end{array} \]

The structure in (33) is impossible because the feature place is doubly linked to roots which are not identical as far as consonantal and sonorant features are concerned. This means that rules which introduce a change in these features in just one half of a geminate are subject to blockage. In (34), it is demonstrated that the sonorantisation of syllable-final consonants in Hausa (Klingenheben’s Law) is blocked when the syllable-final consonant is part of a geminate consonant.

\[(34) \text{hawsii} \quad \text{‘barking’} \quad \text{(compare: dialectal hapsii)} \]

\[\text{but: babba} \quad \text{‘a big one’} \]

A structural representation is provided in (35).

\[(35) \begin{array}{c}
\text{Root} & \text{Root} & \ast\text{Root} & \text{Root} \\
+\text{cons} & +\text{cons} & -\rightarrow & +\text{cons} +\text{cons} \\
+\text{son} & +\text{son} & +\text{son} & -\text{son} \\
\backslash / & & \backslash / \\
\text{F} & & \text{F} \\
\end{array} \quad \text{(adaptation of Selkirk 1990a:195-196)} \]

Inkelas and Cho (1993) in turn, suggest that geminate inalterability is not caused by the special structure of geminates. According to them, not only geminates behave as ‘inalterable’ but singletons as well – only this is usually not called ‘inalterability’ but ‘exceptionality’. They suggest that they can account for these cases of inalterability without having to introduce special technical conditions (such as Strong Satisfaction, through the Linking Constraint of Hayes or the Uniform Applicability Condition of Schein & Steriade). They develop a theory attributing inalterability to pre-specification. When a single segment is pre-specified for a feature this can make it inalterable to later, default filling in rules. In (36) below, an example is presented of the way in which they analyse a case of geminate inalterability. In Korean /l/ is subject to an allophonic alternation: singletons have dental [l], while geminates are palatal [ʎʎ]).
Inkelas & Cho state that, even though this alternation could be described as geminate inalterability (on the basis of a rule of l-dentalization), they prefer an alternative analysis. They suggest that Korean possesses a geminate specific rule which palatalises laterals while the remaining laterals then undergo the Elsewhere rule (see (37a) and (37b) - taken from Inkelas & Cho (1993) - respectively).

(37) a. Geminate target: ll -> ʎʎ
   b. Elsewhere  l ->  l

The fact that geminates as a class are subject to inalterability, as opposed to the few singletons that behave exceptionally, is because geminates are more often pre-specified (by an earlier rule such as in the Korean example above or by underlying pre-specification) because they occupy coda and onset positions. Therefore geminates will be subject to rules targeting either or both position(s), whereas a given singleton will only be subject to rules targeting either coda or onset positions (clearly, they do not agree to the principles of Strong Satisfaction, such as the Linking Constraint of Hayes 1986a, b or the UAC from Schein & Steriade 1986). The fact that geminates belong to two positions makes them subject to certain rules (to which singletons are not subject), thereby possibly pre-specifying them, because of which an Elsewhere filling-in rule can no longer apply.

According to Inkelas & Cho the unmarked type of inalterability effects involves the resistance of underlyingly morified material to coda sonority constraints. For instance, only sonorants in Hausa may appear in a coda position (38a). However, when the coda is occupied by a geminate consonant, the form is perfectly acceptable (38b). According to the authors, the grammaticality of a non-sonorant in the coda is a result of the prespecification with a mora of the geminate consonant. Because of this prespecification, the Elsewhere Rule, sonorizing obstruents in coda positions, can no longer apply.

(38) a. sauro (*sabro) ‘mosquito’
   b. dabba ‘animal’

(Inkelas & Cho 1993:530, without tone marking)

Inkelas & Cho (1993) refer to the connection between this unmarked type of inalterability based on the resistance of already morified (geminate) material to sonority requirements with Churma’s 1988 observation (referred to in Selkirk 1990a, b) that inalterability effects involve weakening rules.

In the analyses presented in the Appendix, the phenomenon is stipulated rather than explained. As mentioned in section 6.3, the view on Geminate Inalterability adhered to in this dissertation, is stated by, among others, Goldsmith (1990) and Harris (1990, 1994). In this view geminates do not violate phonotactics because of licensing considerations. Geminates are associated with both a coda
position and an onset position and the coda position gets licensing potential from its head, the onset. This potential has diminished, because of which consonants in codas generally share all or part of the segmental material with the following onset. If this is the case, the situation is optimal. In other words, geminates do not change, that is, are inalterable, because the ambisyllabic structure is already optimal in a prosodic sense.