The phonological word in Tilburg Dutch: Government phonology and a city dialect of Dutch
Swets, F.H.C.

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3 Word-final consonants

3.1. Introduction

Diphthongs are usually considered to consist of two vowels. Tilburg Dutch has sequences such as /blei/ ‘glad’, /vrau/ ‘woman’ and /røy/ ‘mouling’.¹ Those familiar with Dutch observe a strong phonetic similarity with sequences in, among others, the standard variety of this language. Standard Dutch also has /blei/, /vrau/ and /røy/: these sequences are called diphthongs.²

Nevertheless I do not discuss these sequences in the chapter concerned with Tilburg vowels, Chapter 4. In the present chapter I will demonstrate that, even though this dialect has vocoid sequences phonetically similar to the Standard Dutch diphthongs, there is a fundamental reason for not treating these as part of the vowel system. The reason for this is the difference in structure between the Standard Dutch and the Tilburg Dutch vocoid sequences. The main observation is that the final high vocoids of Tilburg Dutch sequences such as /ei/, /øy/ and /au/ are not in the nucleus but in the onset. In other words, they are consonants, not vowels. Consequently, diphthongs (in the true sense) do not exist in this dialect.

For older speakers it has indeed sometimes been claimed that Tilburg Dutch has no diphthongs (Van Oostendorp 2000, referring to Van Rijen 1993). That is, where speakers of Standard Dutch would have a diphthong, (older) speakers of Tilburg supposedly often use a long lax vowel. Thus, there is a clear correspondence between long vowels in Tilburg Dutch and diphthongs in Standard Dutch, e.g. Tilburg Dutch /reik/ (‘rich’) and /mœys/ (‘mouse’) for Standard Dutch /rek/ and /mœys/. Younger speakers of Tilburg Dutch are said to have developed /ai/ and /au/, possibly under the influence of the Standard Dutch equivalents /ei/ and /au/ (Van Oostendorp 2000). Boutkan & Kossman (1996:18-20) provide a list of diphthongs in their description of the phonology of Tilburg Dutch, but argue that the choice whether one considers the second part of the vocoid sequence to be a vowel or a consonant, is rather arbitrary. They choose for the latter option.

My suggestion is similar to that of Boutkan & Kossman: I consider these high vocoids to be consonants. This is not an arbitrary choice: there is a fundamental structural difference between Standard Dutch /ei/ and Tilburg Dutch /ei/. In Standard Dutch this sequence constitutes a true diphthong, with both vocoids in the nucleus of the syllable, while in Tilburg Dutch the second vocoid is not part of the nucleus but is a consonant in an onset position of the word. The proposal in this chapter is that this difference between Tilburg Dutch and Standard Dutch not only represents the

¹ Boutkan & Kossmann (1996) give a lax instead of a tense second vocoid. For the present analysis this distinction between, for instance, /u/ and /û/ or /u/ and /au/ is not important. What matters, is that we are dealing with a high vocoid, whether tense or lax.

² Below, in section 3.5.2.3, it will be argued that /au/ consists of a vowel and consonant.
fact that diphthongs are marked and ‘ungrammatical’ in Tilburg Dutch. It is also
due to the fact that Tilburg Dutch belongs to those language systems in which the
word-final segmental material has to occupy an onset position. Onset-positions are
preferably occupied by consonantal segments – that is, by segments with little
sonority. Consequently, words in this dialect preferably end in a consonant.

Contrary to Standard Dutch, Tilburg Dutch vocoid sequences always occur
in word-final position and never word-internally. This is because the need to end in a
consonant can be satisfied at relatively low cost, if the high vocoid (/i/, /y/, or /u/)
surfaces as a glide. There is no need to add a consonant or to delete one or more
vowels. It suffices to link the high vocoid in question to the consonantal onset
position. The demand that word-final segments be in an onset manifests itself in the
fact that this dialect has relatively few words ending in a vowel as well. In Standard
Dutch the situation is different: although some influence of the requirement to end in
a consonantal position can be detected, this constraint is ‘less active’.

The main goal of this chapter is to demonstrate the importance of this
requirement for Tilburg Dutch. It is in some sense a counter-intuitive requirement:
while syllables are reputed for their ‘wish’ to be open, that is end in a vowel,
phonological words thus have an opposite requirement. I will argue that, in spite of
the apparent inconsistency of such a constraint, it perfectly suits the Tilburg Dutch
data. Furthermore, I will demonstrate that it not only accounts for the Tilburg Dutch
data but also for a range of other data in other languages.

The second goal is to demonstrate that GP theory should consider these
facts and find some way to include them in the theory. The necessity for word-final
segments to occur in an onset has for the first time been expressed in Optimality
Theory by a constraint, FINAL-C (McCarthy 1993). This constraint has clear
connections with views on representations and is consequently relevant for GP as
well.

The chapter is structured as follows. In 3.2 I discuss the different kinds of
diphthong-like sequences in Dutch. In 3.3 I will present the Tilburg Dutch vocoid
sequences, which constitute the main topic of discussion in this chapter. The data
will be followed by a proposal for an analysis, based on FINAL-C, as well as on other
constraints, in 3.4. In 3.5 I discuss possible exceptions to FINAL-C in Tilburg Dutch,
concluding that French loanwords are the only exceptions. In 3.6 I will demonstrate
that the FINAL-C analysis of Tilburg Dutch vocoid sequences analysis is
corroborated by other facts in the same language as well as by data in other
languages.

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3 I have already mentioned that in general the role of Optimality Theory is not as significant in
this thesis as that of Government Phonology. In this chapter OT will however function as an
important tool, mainly because the demand for word-final segments to occur in an onset, has
first been put forward and extensively discussed in an OT framework. Furthermore, OT is a
useful framework to express variation between languages.
3.2. True and pseudo-diphthongs

Before arguing that Tilburg Dutch has no diphthongs, I need to elucidate what I mean by diphthong. The term is used in various ways in the linguistic literature. It is used in a broad sense, to characterise all sequences of more than one vocoid. In its narrow sense - and that is the way I will use the term here - it is used to indicate a sequence of two vocoids, which are both inside the nucleus.

The structure of Standard Dutch vocoid sequences is presented in (1) and (2) below, with the relevant vocoid sequences underlined. First of all, in (1) a word-internal sequence is given. Note that in Standard Dutch word-internal vowel-glide combinations only occur before coronal consonants. Without proposing an account of this, Booij (a.o. 1995:19) mentions that in Dutch ‘glides cannot be followed by other consonants (except alveolar obstruents).’ Below, when I discuss Tilburg Dutch vocoid sequences as well as in the section concerning the Standard Dutch sequence /au/, I will propose an explanation of this fact. In (2a) a similar sequence in word-final position can be found. In both (1) and (2a), the second vocoid - for example /i/ or /u/ - is in the nucleus and therefore constitutes the second part of a diphthong. In (2b), on the other hand, the second vocoid is in the onset; it is therefore not vowel but a consonant, a glide.4 Recall, for that matter, what has been said in Chapter 2 regarding constituent structure and word-final consonants in GP. Both theory-internal as well as theory-external arguments have led to the GP view of word-final consonants as onsets followed by empty nuclei, instead of codas.

(1) Structure of vocoid sequences word-internally

<table>
<thead>
<tr>
<th>Diphthong</th>
<th>*Vowel-Glide combination</th>
</tr>
</thead>
<tbody>
<tr>
<td>R O R</td>
<td></td>
</tr>
<tr>
<td>N N</td>
<td></td>
</tr>
<tr>
<td>/ \</td>
<td></td>
</tr>
<tr>
<td>x x x x</td>
<td></td>
</tr>
<tr>
<td>V i/u C V</td>
<td></td>
</tr>
</tbody>
</table>

*rijke ‘rich’ (St.Dutch) *ajp

---

4 It is generally accepted that the difference between glides and the corresponding high vowels is based upon the position in which they find themselves. This is also the position I take here. Onsets and coda/rhymal adjunct positions typically are occupied by consonants, whereas vowels are always found in nuclei.
Generally, diphthongs are assumed to be falling or rising and short or long. The differences between these are as follows. First of all, whereas a long diphthong consists of two skeletal positions, a short diphthong only consists of one. Short diphthongs are among others found in Modern Icelandic, such as in the word */'hjáhta/* 'stop' (Gussmann 2002:27). The difference between a falling and a rising diphthong is that in a falling diphthong the high vocoid is the second part of the diphthong (/ei/) whereas in a rising one the higher vocoid is the first element (/ie/). Examples of rising diphthongs can be found in, for instance, Slovak. In Kenstowicz (1994) the genitive plural of feminine nouns is discussed. These nouns are formed by the lengthening of the final syllable of the stem. That is, high and low vowels are lengthened and mid vowels turn into rising diphthongs, as in (3).

Since only falling, long diphthongs occur in Dutch I will not consider short or rising diphthongs in this thesis.

3.3. Word-final restrictions

Tilburg Dutch has relatively few words ending on a vowel. Words, which do end on a vowel often are function words (4a), interjections (4b) or French loans (4c).

(4) a. Tilburg Dutch function words

me  ‘with’
ye  ‘you’
we  ‘what’
(4) b. Tilburg Dutch exclamations and interjections:
- ‘yugh’
- ‘yes’
- ‘gee!’

(4) c. Tilburg Dutch (not very recent) French loans
- ‘trust’
- ‘medal’
- ‘arrogance’
- ‘police’

These vowel-final words are relatively rare and belong to certain clearly defined word classes. Below, in 3.5.1 and 3.5.3, possible accounts of these cases are presented.

Besides the cases mentioned above, words hardly ever end in a vowel in this dialect. Word-finally, in addition to consonant-final stems only vocoid sequences occur. The vocoid sequences which can be found in this dialect, are presented in (6). The list is not exhaustive. Whereas they are excluded word-internally, even word-finally vocoid sequences are relatively rare.  

First of all in (5), the attested sequences are presented in a vowel chart; for convenience, not with the use of elements but with features.

<table>
<thead>
<tr>
<th>(5) a. +ATR</th>
<th>Front</th>
<th>Back</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unrounded</td>
<td>Rounded</td>
</tr>
<tr>
<td>High</td>
<td>iu</td>
<td>yu</td>
</tr>
<tr>
<td>Mid</td>
<td>ai/au</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>(5) b. -ATR (short)</th>
<th>Front</th>
<th>Back</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unrounded</td>
<td>Rounded</td>
</tr>
<tr>
<td>High</td>
<td>ei</td>
<td>æy</td>
</tr>
<tr>
<td>Mid</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

5 As will become clear later on, these vocoid sequences appear in two contexts: word-finally, as shown here, and before inflectional coronal obstruents.
-ATR (long)

<table>
<thead>
<tr>
<th></th>
<th>Front</th>
<th>Back</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unrounded</td>
<td>Rounded</td>
<td></td>
</tr>
<tr>
<td>High</td>
<td></td>
<td>ùi</td>
</tr>
<tr>
<td>Mid</td>
<td></td>
<td>ùi</td>
</tr>
<tr>
<td>Low</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Not all sequences are equally common (the sequence /æi/, for instance, is rare with only one example attested (/hɔi/ ‘hello’)). All Tilburg Dutch vocoid sequences show exactly the same distributional patterns. I will discuss here the sequences which are phonetically similar to, but distributionally distinct from, some sequences in Standard Dutch. To give an impression of all the vocoid sequences found in this dialect, one or more example is given of all of them in (6) below.

(6) Examples:

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>iu</td>
<td>kiu</td>
<td>‘gill’ (only one example found)</td>
</tr>
<tr>
<td></td>
<td>yu</td>
<td>nyu</td>
<td>‘new’ (also nyt, ny)</td>
</tr>
<tr>
<td></td>
<td>ui</td>
<td>kui</td>
<td>‘cow’</td>
</tr>
<tr>
<td></td>
<td>yui</td>
<td>‘good’</td>
<td></td>
</tr>
<tr>
<td></td>
<td>øu</td>
<td>løu</td>
<td>‘lion’</td>
</tr>
<tr>
<td></td>
<td>ai</td>
<td>ai</td>
<td>‘egg’</td>
</tr>
<tr>
<td></td>
<td>kai</td>
<td>‘stone’</td>
<td></td>
</tr>
<tr>
<td></td>
<td>karwai</td>
<td>‘job’</td>
<td></td>
</tr>
<tr>
<td></td>
<td>au</td>
<td>yau</td>
<td>‘soon’</td>
</tr>
<tr>
<td></td>
<td>kau</td>
<td>‘cold(ess)’</td>
<td></td>
</tr>
<tr>
<td></td>
<td>uæi</td>
<td>ræi</td>
<td>‘red’</td>
</tr>
<tr>
<td></td>
<td>eæi</td>
<td>hæi</td>
<td>‘he’</td>
</tr>
<tr>
<td></td>
<td>blei</td>
<td>‘glad’</td>
<td></td>
</tr>
<tr>
<td></td>
<td>reit</td>
<td>‘drive (2 and 3 s.) ’</td>
<td></td>
</tr>
<tr>
<td></td>
<td>æey</td>
<td>ræy</td>
<td>‘moult’</td>
</tr>
<tr>
<td></td>
<td>rœyt</td>
<td>‘moult (2 and 3 s.) ’</td>
<td></td>
</tr>
<tr>
<td></td>
<td>læy</td>
<td>‘slow(ly)’</td>
<td></td>
</tr>
<tr>
<td></td>
<td>æi</td>
<td>hæi</td>
<td>‘hello’ (only one example found)</td>
</tr>
<tr>
<td></td>
<td>æi</td>
<td>slæi</td>
<td>‘lettuce’</td>
</tr>
<tr>
<td></td>
<td>kæi</td>
<td>‘bad’</td>
<td></td>
</tr>
<tr>
<td></td>
<td>au</td>
<td>vrau</td>
<td>‘woman’</td>
</tr>
<tr>
<td></td>
<td>kæus</td>
<td>‘stocking’ (exception)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>pauk</td>
<td>‘kettledrum’ ,</td>
<td></td>
</tr>
</tbody>
</table>
The general picture is clear. In lexical items in Tilburg Dutch, vowels hardly ever occur word-finally while vocoid sequences only occur word-finally (or before an inflectional coronal obstruent, as in /reit/ ‘drive 2 and 3 s.’). There is thus a complementary distribution: word-finally vocoid sequences occur and no ‘simple’ vowels can be found; word-internally we find all kinds of vowels, but hardly any vocoid sequences (except before the inflectional coronal). As an illustration, look at (7).

(7) word-finally word-internally
blei ‘glad’ med ‘girl’
rey ‘moulting’ ræt ‘diamond’

If we compare these Tilburg vocoid sequences with some phonetically similar sequences in the standard language, we find a remarkable difference between the two variants. In Tilburg Dutch vocoid sequences (such as /ui/, /ei/, /æyi/, and /uï/) only occur word-finally or before an inflectional coronal. In Standard Dutch, on the other hand, we can distinguish two patterns. Some Standard Dutch sequences (e.g. /ai/ and /oi/) show the same co-occurrence restrictions as vocoid sequences in Tilburg Dutch: they occur word-finally and before an (inflectional) coronal. However, other sequences can be followed by almost any kind of consonant (for instance, /ei/). In (8) the Standard Dutch vocoid sequences are given. The sequences which are underlined may co-occur with almost any kind of consonant whereas the other sequences show similar restrictions to the Tilburg Dutch sequences.

(8) Standard Dutch vocoid sequences
iu ui
eu / eI /ëyi /æyi / ju7 /eI /ai /aI

Thus, in Standard Dutch the /iu/, /eu/, /æyi/, ai, and /ai/ can only occur word-finally and with (mostly inflectional) coronal obstruents, just like all Tilburg vocoid sequences as in (9a). The second group of vocoid sequences is commonly believed to co-occur with all sorts of consonants, as in (9b).

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6 I could make similar remarks in comparing the Tilburg facts with facts from other Dutch dialects. In fact, at the end of the chapter some remarks concerning the character of vocoid sequences in other Dutch dialects are made. For now I limit myself to a comparison with the standard language.

7 The Standard Dutch vocoid sequence /au/ is generally assumed to co-occur with all kinds of consonants, just like /ei/ and /æyi/. However, as will be discussed below, the behaviour of /au/ does not really match that of /ei/ and /æyi/. I will try to demonstrate that this difference in behaviour is due to the consonantal status of the second part of the /au/.
(9) a. Examples of vocoid sequences word-finally or before an inflectional coronal in Standard Dutch

<table>
<thead>
<tr>
<th>Dutch</th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td>mooi</td>
<td>/oii/</td>
</tr>
<tr>
<td>kooi</td>
<td>/aai/</td>
</tr>
<tr>
<td>zooi</td>
<td>/aai/</td>
</tr>
<tr>
<td>hij gooit</td>
<td>/ai/</td>
</tr>
<tr>
<td>etc.</td>
<td>etc.</td>
</tr>
</tbody>
</table>

Examples of Standard Dutch vocoid sequences with other than coronal obstruents

(9) b.

<table>
<thead>
<tr>
<th>Standard Dutch</th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td>/ei/</td>
<td>reipst 'ripest'</td>
</tr>
<tr>
<td></td>
<td>reik 'rich'</td>
</tr>
<tr>
<td></td>
<td>weif 'woman (pejorative)'</td>
</tr>
<tr>
<td></td>
<td>heix 'pant (1 s.)'</td>
</tr>
<tr>
<td></td>
<td>blei 'glad'</td>
</tr>
<tr>
<td>/œy/</td>
<td>rœyt 'window-pane, diamond'</td>
</tr>
<tr>
<td></td>
<td>rœym 'large, wide'</td>
</tr>
<tr>
<td></td>
<td>hœys 'house'</td>
</tr>
<tr>
<td></td>
<td>kœyp 'tub'</td>
</tr>
<tr>
<td></td>
<td>rœy 'moult'</td>
</tr>
</tbody>
</table>

The second group of Standard Dutch diphthongs – those occurring in non-final position – generally correspond to Tilburg Dutch long lax vowels, as in (9c).

(9) c. Tilburg Standard Dutch

<table>
<thead>
<tr>
<th>Standard Dutch</th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td>/e/</td>
<td>/ei/</td>
</tr>
<tr>
<td>de:ek</td>
<td>de:ik 'dike'</td>
</tr>
<tr>
<td>ve:ef</td>
<td>veif 'five'</td>
</tr>
<tr>
<td>re:ekst/rekst</td>
<td>reikst 'richest'</td>
</tr>
<tr>
<td>ye:xt</td>
<td>yeit 'goat'</td>
</tr>
<tr>
<td>/œ:/</td>
<td>/œy/</td>
</tr>
<tr>
<td>rœ:em</td>
<td>rœym 'spacious'</td>
</tr>
<tr>
<td>rœ:et</td>
<td>rœyt 'window'</td>
</tr>
<tr>
<td>hœ:es</td>
<td>hœys 'house'</td>
</tr>
<tr>
<td>slœ:x:po</td>
<td>slœyp:ø 'to steal'</td>
</tr>
</tbody>
</table>

Summarising, in two closely related languages - Tilburg Dutch and Standard Dutch - similar vocoid sequences show distinct distribution patterns. Furthermore, lexical words with word-final vowels are relatively rare in both languages, but even more so in Tilburg Dutch. In Tilburg Dutch the relatively rare words which do end on a vowel are mainly function words, exclamations, interjections, and French loans. In
the next section I try to account for the difference in distribution between diphthong-like sequences (word-finally) and monophthongs (word-internally) in Tilburg Dutch and for the differences in this respect between Standard and Tilburg Dutch.

I will argue that the difference between the two varieties of Dutch is partly due to a difference in the markedness or acceptability of diphthongs. In the Tilburg dialect the grammar does not allow them, contrary to the standard dialect. The standard dialect does not allow for long lax vowels, whereas in the Tilburg dialect these vowels are very common. The most interesting difference is the difference with respect to the restrictions regarding word-structure: in Tilburg Dutch words preferably have their word-final segmental material occurring in an onset, contrary to the standard dialect in which this preference seems less influential. These differences will be expressed in the technical apparatus of OT, through the FINAL-C constraint (McCarthy 1993).

3.4. Analysis: FINAL-C and other constraints

For the analysis of the distributional peculiarities of vocoid sequences in Tilburg Dutch, as compared to those in the standard Dutch dialect, I will consider Standard Dutch /ei/ and Tilburg /ei/ and /e/. Standard Dutch /ei/ is suitable because in this variant this vocoid sequence is found in the nucleus, accepting almost any kind of consonant(s) to occur after it. I compare this Standard Dutch diphthong with the Tilburg Dutch long lax vowel /e/ (word-internally) and vocoid sequence /ei/ (word-finally).

My analysis of words without inflectional affixes is based on the insights expressed below. In the case at hand, I will demonstrate that in Tilburg Dutch, more than in the standard dialect, the word-final material must be in an onset (by definition followed by an empty nucleus). This grammatical difference between the two varieties can be efficiently expressed by an OT constraint: FINAL-C.

3.4.1. FINAL-C or the need for word-final material to be in an onset

First of all, I want to account for the fact that we find long, lax vowels word-internally in Tilburg Dutch but not word-finally; in word-final position one usually finds a vocoid sequence. In Standard Dutch this distributional distinction is less strong. This makes sense if we assume that in the Tilburg dialect the constraint that word-final segments should occur in onsets, followed by empty nuclei, is more relevant than in Standard Dutch. That is, this distributional distinction is to be expected if FINAL-C is more important, higher-ranking, in Tilburg Dutch than in Standard Dutch.

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8 Long lax vowels do occur in Standard Dutch loanwords. Examples are /sɛːrəl/, /froːləl/ (‘sun lounge’, ‘lady’) etc.
FINAL-C is a constraint saying that ‘a Prosodic Word cannot end in a (short) vowel, though it can end in a consonant or glide’ (McCarthy 1993:176). This constraint can be interpreted in more than one way. A discussion of some interpretations and a motivation of the interpretation chosen in this thesis follow in 3.5.3. For now, we assume the following definition, slightly adjusted to the GP framework:

(10) \textbf{FINAL-C} \quad \text{Word-final segmental material must occur in an onset position}

The high position of this constraint in the hierarchy of Tilburg Dutch accounts for the fact that we find vocoid sequences word-finally but not word-internally. In words such as /mɛx/ and /rɛxf/ (‘girl’ and ‘rake’, respectively) there is a word-final consonant (/d/ and /f/, respectively) so the high element, occupying the second position of the vocoid sequence, does not have to function as such. Let us consider the (simplified) tableaux of /blei/ and /mɛx/ in which we can observe that, in words \textit{without} a final ‘true’ consonant, the high element takes the final onset position in order to satisfy FINAL-C (cf. 12), whereas in consonant-final words the high element occurs in the nucleus - its preferred position (cf. 16).

The tableaux presented in (11), (15) and (16) may be considered mini-grammars of this dialect, accounting for the distribution of the elements I and U. First of all, let us consider the evaluation of an input, which ends in a vocoid sequence in (11).

(11) Tilburg Dutch

<table>
<thead>
<tr>
<th></th>
<th>FINAL-C</th>
<th>*M/I(¬U)</th>
<th>*P/I(¬U)</th>
</tr>
</thead>
<tbody>
<tr>
<td>[bl(e)ni]</td>
<td>*!</td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>[bl(e)i]</td>
<td>*!</td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>♦ [bl(e)i]</td>
<td>*</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

FINAL-C has the highest position in the hierarchy: outputs ending in a long lax vowel are generally ungrammatical and unattested. Consequently the candidates [bl(e)ni] and [bl(e)i] are rejected by the first constraint, FINAL-C.

In Tilburg Dutch elements such as I and U occur in a nuclear position rather than in a consonantal position. This is formulated as *M/I (¬U) >> *P/I (¬U) (cf. Prince & Smolensky (1991)), which expresses that the element I (and U) rather occurs in a nucleus (‘P’ stands for peak or nucleus) than in a margin (‘M’ is margin, that is, an onset or coda position). In other words, it is worse for I and U to occur in a margin than in a peak position. However, constraints are violable and this is exactly what happens here: although the I element would rather not, it occurs in a margin (that is, onset) position, however \textit{only} because, that way, a more important (therefore higher-ranking) constraint can be satisfied. That is, the I element occurs in a word-final onset, violating *M/I (¬U), forced to do so by FINAL-C. Consequently, the I element will only be part of the long lax vowel in the nucleus in consonant-final words, in which FINAL-C is inherently satisfied, as we will see below. bl(e)ni
consequently is the form which gets the pointed finger (✧) in the tableau, as it is the winning candidate.

In (12) the representations of \([\text{bl}(\varepsilon)_N\text{i}]\) and \([\text{bl}(\varepsilon_i)_N]\) are given to show the structural difference between the two forms and to demonstrate why \([\text{bl}(\varepsilon_N\text{i})]\) satisfies FINAL-C.

(12) a. 

```
O | R | O | R\text{\_o}
N | | N | |
|   |   |   | |
x  | x  | x  | x
(b) A |   |   |
|   |   | I
[\text{bl}(\varepsilon_N\text{i})]
```

(12) b. 

```
*O | R | *R\text{\_o}
N | |
|  \    \    |
x  | x  | x  | x
(b) A |   |
|   | I
[\text{bl}(\varepsilon_i)_N]\n```

In (12a) the I element is linked to the onset position, thereby satisfying FINAL-C. In (12b) the I element occurs exclusively in the nucleus; this gives a fatal violation of FINAL-C.

The tableau in (11) accounts for the fact that we find vocoid sequences only word-finally. Of course, this is based upon the assumption that the element I, which represents the high vocoid /i/, is in an onset position and not in the nucleus. One might wonder whether there is any motivation for the assumption that the element I in /blei/ may occur in an onset at all: that is, how do we know that \([\text{bl}(\varepsilon_N\text{i})]\) is a possible representation? After all, not every vocoid can appear in a consonant position. Furthermore, we have just observed that I and U elements rather occur in nuclei than in onsets or coda’s - as represented by the ranking \(*M/I (~\text{U})\) over \(>>\) \(*P/I (~\text{~U})\). This is where another constraint becomes relevant: POSS-MAR (πMar = I (~U)) (Prince & Smolensky (1991)).
3.4.2. POSS-MAR$_r$ (Mar = I (~U))

The constraint POSS-MAR $(\pi_{Mar} = I (~U))$ (Prince & Smolensky (1991) is defined as follows.

\[(13) \quad \text{POSS-MAR } (\pi_{Mar} = I/U) \quad \text{Segments with a sonority greater than } \pi_{Mar} \text{ may not be parsed as margins (=onsets or rhymal adjunct positions/codas)}\]

The constraint in (13) tells us which segments may occur in an onset or rhymal adjunct/coda position. It is a parameterised constraint: the value of $\pi_{Mar}$ depends on the language in question as well as on the universal sonority hierarchy. For Tilburg Dutch the value of $\pi_{Mar}$ turns out to be I and U (in elemental terms) or /i/ and /u/ (in terms of the segments, represented by these elements), implying that no element with a higher sonority than I or U may occur in a consonantal position.  

This constraint is motivated as follows.

First of all, the assumption that single I and U elements may occur in onset positions, is not unjustified: high vocoids in onset positions are relatively rare in Tilburg Dutch but they do occur. For instance, there are words beginning with a single element I, commonly transcribed as /i/ in Tilburg Dutch (e.g. /jønk/ ‘young’, /jør/ ‘year’, etc).  

This means that a single I element can occupy a final onset position in Tilburg Dutch, whereas, for instance, a single A or a combination of A and I could not (cf. 14).

\[(14) \quad \begin{array}{c|c|c} \text{O} & \text{R} & \text{O} \\ \hline \text{N} & \text{N} \end{array} \quad \begin{array}{c|c|c} \text{*O} & \text{R} & \text{O} \\ \hline \text{N} & \text{N} \end{array} \]

In (14a) the I element is fused with A in the nucleus, as a representation of [e]. However, the word-final onset position is occupied by the element I only. This accounts for the fact that words with final /i/ — in a word-final onset position, that

\[\text{[blei]}\]

9 If I would be fused with, for instance, A, the result would be a segment with a higher sonority (/e/), which would render its occurrence in a consonantal position impossible (in this language).

10 The situation of the U element is more complicated. It seems as if it is more consonantal than the I element. It might be the case that this is a quality of the element U as such or it might be the case that in consonantal position [u] is not just the element U but has some element extra. I will not go into this subject any further (but see Van der Torre 2003).
is, not in the nucleus — are acceptable, whereas for instance words, ending on /a/ (or element A) are not, even if this vowel is linked to a word-final onset position (cf. 14b). Of course, this is why in Dutch we have no glide corresponding to the A element: the constraint forbidding segments more sonorous than /l/ in such a position, prohibits this. \(^{11}\) Note that violating POSS-MAR in order to satisfy the constraint FINAL-C, is not possible because POSS-MAR is more important, higher-ranking, than the constraint necessitating word-final material to be licensed by an onset. Consider the tableau in (15).

(15) Tilburg Dutch

<table>
<thead>
<tr>
<th></th>
<th>POSS-MAR</th>
<th>FINAL-C</th>
<th>*M/I(¬U)</th>
<th>*P/I(¬U)</th>
</tr>
</thead>
<tbody>
<tr>
<td>/blei/</td>
<td>[bl(e)_N]</td>
<td>*!</td>
<td></td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>[bl(ei)_N]</td>
<td>*!</td>
<td></td>
<td>*</td>
</tr>
</tbody>
</table>

The position of POSS-MAR in the hierarchy is the highest of all constraints. Therefore an imaginary word-final sequence of the type in (14b) can never be found in Tilburg Dutch: with no higher-ranking constraint present to force the violation of POSS-MAR, such an extremely marked segment would never be licensed to occur in that (onset) position. Consequently, such input would never get a phonetic interpretation.

I have discussed the constraints FINAL-C, *M/I (¬U), *P/I (¬U) and POSS-MAR. We have seen why the phonetic form [blei] has a representation with the high vocoid – the element I – in the word-final onset position and not in the nucleus ([bl(e)\_N] \textit{vs.} *[bl(ei)\_N]). We have also observed the importance of FINAL-C: without it, the I element would simply occur in the nucleus, as it prefers to do. This means that at least part of an answer is proposed to the question regarding the rarity of words ending in vowels in Tilburg Dutch. If in the input of a word there is a word-final element I or U, it attaches to the word final onset and consequently satisfies the high-ranking FINAL-C. However, there is another distributional fact to account for. Above an attempt has been made to explain why word-finally there are hardly any vowels. But, we have still to account for the fact that word-internally there are hardly any vocoid sequences in Tilburg Dutch. This is where the constraints *DIPHTHONG and *LONGVOWEL (*LONGV) become important.

\(^{11}\) Note that for English it has been suggested that the /\textit{r}/ is the ‘glide’ variant of the /a/. There is some discussion about the best way to represent coronal consonants, a.o. in view of the phenomena of the intrusive /\textit{r}/ in English and the placeless /\textit{r}/ in Dutch dialects (Van Oostendorp 2001). For instance, Kaye and Ploch assume that the R-element and the A-element should be merged in one and the same element, A (discussion in Linguist List 12.1701, 2001)
3.4.3. *DIPHTHONG and *LONGVOWEL (*LONGV)

The constraints *DIPHTHONG and *LONGVOWEL (*LONGV) have not yet been discussed. They are included in the tableau in (16).

(16) Tilburg Dutch

<table>
<thead>
<tr>
<th>Input</th>
<th>POSS-MAR</th>
<th>FINAL-C</th>
<th>*M/I (~U)</th>
<th>*DIPHTHONG</th>
<th>*LONGV</th>
<th>*P/I (~ U)</th>
</tr>
</thead>
<tbody>
<tr>
<td>/mEùd/</td>
<td>[m(ε)N]</td>
<td>[m(ε)N]</td>
<td>*</td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>[m(ε)N]</td>
<td>*!</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[m(ε)N]</td>
<td>*!</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The input /mEùd/ in (16) surfaces with a long lax vowel because apparently a diphthong – two vocoids occurring in a nucleus – is impossible. Given that FINAL-C is already satisfied by the word-final consonant, no violation of *M/I (~U) is enforced. That is, we do not expect the occurrence of a form such as *[m(ε)N]i]: FINAL-C is satisfied by the word-final [d].

It is a well-known observation that there are languages that do not have diphthongs. Tilburg Dutch appears to be one of them: it dislikes diphthongs and prefers long (lax) vowels. Standard Dutch seems to be the opposite. It hardly has phonologically long vowels, but diphthongs amply occur in this dialect. In OT, the constraints *DIPHTHONG and *LONG VOWELS can be used to account for this. These are merely descriptive labels and I propose that what they stand for is the following:

(17) *DIPHTHONG all material in a dependent position of a nucleus must also be licensed by the head position

(18) *LONG VOWEL elements in a nuclear non-head position may not be as sonorous as elements in the head position.

In these definitions, it is assumed that whether a language allows for diphthongs or long vowels (or both) is decided in phonology. *DIPHTHONG means that it is only acceptable for an element to be in a dependent nonhead position if this element is also licensed by the nuclear head. *LONG VOWEL on the other hand stands for the demand that elements in a dependent position of a nucleus may not be as sonorous

---

12 As will be discussed in Chapter 4, I adopt the proposal of analysing phonetically long/tense vowels as vowels, which are phonologically tense or which lack the feature lax. This means that phonologically long vowels are very infrequent in the standard dialect - exceptions are (often French) loans such as [sɛːra], [fʁɛːls] (‘sun lounge’, ‘lady’), etc.
as the material in the head. This is based on the assumption that segmental material rather is in a head position than in a dependent one.

The view that in the case of diphthongs and long vowels segmental material is licensed in the dependent position as well, is contrary to what has been observed in the section dealing with constituent structure in GP (cf. Chapter 2, section 2.3). I have mentioned there that, if melodic material is shared in governing domains it is usually considered to be the case that (part of) the phonetic interpretation of a licensed position is determined by the content of the licensor. This is expressed by Harris in the following way: ‘This implies that the relevant melodic content is distinctively lodged in the licensing position, even though its phonetic manifestation is smeared over both positions’ (Harris 1994:166). The case of diphthongs, among others, argues for the assignment of material in a licensed position in phonology itself and not in phonetics. As an illustration, consider a similar case of sharing of material between two position, namely that of branching onsets. Two kinds of branching onsets are presented below.

(19) a. dr  b. *dd

```
  O     O
/ \   / \  
x   x  x   x
L   L
|   |
h   h
R   R
```

In (19a) the elemental composition of a very common branching onset in Dutch is represented (as in, for instance, /drad/ ‘thread’, /drox/ ‘dry’). Dutch has no geminate onsets: a structure such as the one shown in (19b) is impossible. It is well known that languages do not generally favour geminate onsets or onsets consisting of two segments with only little difference in sonority: the sonority slope in an onset is relatively steep cross-linguistically and this is usually given as an argument for the rarity of geminate onsets. This is rather unexpected if phonologically the melodic material only occurs in the licensing position: if for instance in the representation of a geminate onset, the dependent position in such a domain would phonologically be empty, the interpretation being just a matter of phonetics, one would expect geminate onsets to be commonly found cross-linguistically.

The same is true is the case of diphthongs and long vowels. The distinction between long or geminate vowels on the one hand and diphthongs on the other, clearly is a phonological one. However, if all material in such a branching constituent is located in the head, the distinction between diphthongs and long vowels is also largely phonetic. After all, the only distinction between these depends on whether phonetically all material is spread to the dependent position or only some of it.
The notion of Licensing Inheritance (Harris 1994, 1997) has presented the theory of GP with a means to understand why the dependent position can license less material than the head: after all, the prosodic licensing potential becomes depleted when going from head to dependent. The less prosodic licensing power is left for a position, the less autosegmental licensing power it has to license material or, in other words, P-licensed units can A-license less material than P-licensing units. If a dependent position shares its material with its licensing head, this dependent position does not need as much licensing potential. This is why in a coda position some or all of the material is shared with the following, licensing onset. Likewise, in a branching nucleus most material occurs in the head position, the dependent position only licensing the same material as that in the head (long vowels) or the dependent position only licensing material which is less sonorous.

Now that we have discussed all relevant constraints, some remarks concerning the precise ranking of these constraints in this mini grammar of Tilburg Dutch are in order. The fact that only high vocoids (and never A elements, for instance) occur in a word-final onset position in Tilburg Dutch indicates a ranking of POSS-MAR over (>>) FINAL-C. That is, the constraint saying that no element more sonorous than a single I or U element may ever occur in a consonantal or margin position is more important in this dialect than the constraint forcing the final element in the final onset position. This gives us the following ranking.

\[(20) \text{POSS-MAR} >> \text{FINAL-C}\]

Clearly, the fact that we find [blEi] and not [blei] in Tilburg Dutch indicates that FINAL-C is higher ranked than *M/I (or U) – the constraint *P/I (or U) being so low in the hierarchy that its influence is not felt. That is, although it is undesirable for an I or U element to occur in a margin position (≠*M/I (or U)), it may do so if by violating *M/I (or U), FINAL-C can be satisfied. This gives us the order in (21).

\[(21) \text{POSS-MAR} >> \text{FINAL-C} >> \text{*M/I (or U)} >> \text{*P/I (or U)}\]

The constraint *DIPHTHONG is higher in the hierarchy in Tilburg Dutch than *LONG VOWEL. This gives us the hierarchy we have seen in (16).

We can now compare this mini grammar of Tilburg Dutch with that of Standard Dutch. In (22) a tableau of [blei] in Standard Dutch is presented, and in (23) that of a consonant-final word, such as [meid]. It is clear that FINAL-C is lower ranking in Standard Dutch than in Tilburg Dutch.\(^{13}\) Furthermore, recall that in Tilburg Dutch [bl(e_N i] is the final output, demonstrating that in this variety it is worse for a word not to end in a consonant than to have the element I in a margin position. In Standard Dutch the situation is different: the element I does not occur in the margin position of such a word: after all, it is not forced to do so in order to satisfy a higher-ranking constraint, such as FINAL-C. Finally, there is no high-ranking constraint prohibiting diphthongs.

\(^{13}\) However, see Zonneveld (1978), Kruisinga (1983-1939) and Van Ginneken (1934-1935).
If the account just given explains why, in Tilburg Dutch, words generally do not end in a vowel, we are left with the problem that there are exceptions to this general pattern. I will now propose an account for some of the forms in this dialect which do not satisfy FINAL-C: function words, exclamations, interjections and i-final French loanwords. In the next subsection (3.5.1) function words, exclamations and interjections are discussed. The sequence /au/ is studied in 3.5.2, while French loan words are discussed in 3.5.3.

### 3.5. Possible exceptions to FINAL-C

#### 3.5.1. Function words, exclamations and interjections: exceptions?

We will begin our discussion with a group of words which clearly belongs to the class of function words. To account for the vowel-final forms in (4a) (repeated below), I refer to McCarthy (1993). On the basis of intrusive-r phenomena in Eastern Massachusetts American English, McCarthy suggests that function words are not parsed as phonological words. Considering that FINAL-C only affects phonological words and that function words are not parsed as such, these forms do not need to satisfy the constraint.

(24) Tilburg Dutch function words

<table>
<thead>
<tr>
<th></th>
<th>POSS-MAR</th>
<th>*M/I (~U)</th>
<th>*LONGV</th>
<th>*DIPHTHONG</th>
<th>FINAL-C</th>
<th>*P/I (~ U)</th>
</tr>
</thead>
<tbody>
<tr>
<td>/blei/</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[bl(ε)₀]</td>
<td></td>
<td>*!</td>
<td></td>
<td></td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>![bl(ε)₀]</td>
<td></td>
<td></td>
<td>*</td>
<td></td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>![bl(ε)ᵢ]</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

(22) Standard Dutch

<table>
<thead>
<tr>
<th></th>
<th>POSS-MAR</th>
<th>*M/I (~U)</th>
<th>*LONGV</th>
<th>*DIPHTHONG</th>
<th>FINAL-C</th>
<th>*P/I (~ U)</th>
</tr>
</thead>
<tbody>
<tr>
<td>/m/</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[m(ε)₀]</td>
<td></td>
<td>*!</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>![m(ε)₀]</td>
<td></td>
<td></td>
<td>*</td>
<td></td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>![m(ε)ᵢ]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
A similar explanation can be given for word-final vowels in interjections and exclamations (cf. (4b). It is fairly obvious that these word classes show different phonological regularities in comparison with ‘normal’ lexical words, just like function words are subject to other phonological constraints than lexical words. For instance, the consonant sequence [ts] is almost non-occurring in Standard Dutch (except for rare words such as *tsaar* ‘tsar’). In spite of this, this sequence can be heard often in exclamations. In interjections and exclamations we also find syllable structures that are not acceptable in lexical Dutch words. While in the phonology of Dutch there is a strong ban on syllable final (and word final) lax vowels, we find these in Standard Dutch exclamations and interjections (/bA/ ‘yugh’, /he/ ‘what, how is that?’, /xa/ ‘gee!’, etc.). These common examples are interesting. As will be discussed in Chapter 4, Dutch has a high-ranking constraint (CONNECT N’, LAX) saying that the nucleus of a syllable that consists of a lax vowel needs to be in a branching rhyme; it needs to have a tautosyllabic consonant following it (cf. Van Oostendorp 2000). This constraint is never or almost never violated in lexical words. Nevertheless, it is commonly violated in function words, exclamations, and interjections. If such an important, high-ranking constraint is so commonly violated in such forms, it is only to be expected that violations of a lower-ranking constraint, FINAL-C, occur as well. (25a) presents examples of words violating ‘only’ FINAL-C and (25b) presents examples, in which both CONNECT N’, LAX and FINAL-C are violated. In (26a) and (b), the same is done with function words.

(25) a. Interjections/exclamations violating ‘only’ FINAL-C
   jɔ: ‘yes’
   ne: ‘no’

   b. Interjections/exclamations violating both CONNECT N’, LAX and FINAL-C
   ɣɔ ‘jee’
   ɓa ‘yugh!’

(26) a. Function words ‘only’ violating FINAL-C
   me ‘with’
   wi ‘who’

   b. Function words violating both CONNECT N’, LAX and FINAL-C
   de ‘that’
   zɔ ‘will’

In Boutkan & Kossmann (1996), examples can be found of words such as /stɔ/ ‘stand’ and /wɔ/ ‘would (want)’, violating either just FINAL-C or CONNECT N’, LAX
and FINAL-C. These words may be called semi-lexical (following Corver and Van Riemsdijk 2001, referring to Van Riemsdijk (1998)). Typically, these ‘in-between’ subclasses can be characterised as the most frequently used and semantically least specific members of a lexical category (Emonds 1985:162-191, Corver and Van Riemsdijk 2001). Phonologically they seem to behave as function words.

3.5.2. /au/: an exception to FINAL-C?

I have not yet said much about the vocoid sequence /au/ which occurs in Tilburg Dutch as well as in Standard Dutch and in English. I mentioned that in general the standard dialect vocoid sequences /ei/, /æy/ and /au/ are considered to be diphthongs but that there are some doubts regarding the structure of the sequence /au/. In this section I will demonstrate that /au/ is different from other vocoid-sequences, in Tilburg Dutch as well as in Standard Dutch and in English.

Except for Tilburg Dutch, /ei/, /æy/ and /au/ are usually considered to be diphthongs, especially because they are supposed to have the same distributional possibilities as tense vowels. In this section I propose that the Standard Dutch vocoid sequence /au/ has a different structure than /ei/ and /æy/ in that it accepts either no following consonant at all or only a coronal.

Tilburg Dutch /au/ also has a distinct behaviour. In Tilburg Dutch /ei/ and /æy/ may only occur word-finally or before an inflectional coronal. This is not the case with /au/ which may also occur before a non-inflectional coronal consonant, although this is not frequent. We will first consider the Tilburg Dutch case of /au/.

3.5.2.1. /au/ before non-inflectional consonants in Tilburg Dutch

In Tilburg Dutch the alternation between, for instance, /ei/ and /æ/ is phonologically minimal. The distribution can be argued to be determined by the need to satisfy an important requirement in this dialect, such as the requirement for words to end in onsets or the requirement for words not to have diphthongs. For /au/ the situation is different: there is no such minimally distinct alternative. Therefore, it has to stay a vocoid sequence even when it is followed by a coronal consonant. This is possible because of the special character of coronals. The special situation of coronals will be discussed after having considered why there is no alternative to /au/.

14 The transcription of /au/ varies. For instance, whereas Booij (1995) transcribes the Standard Dutch sequence as /æ/; Van Oostendorp (2000) represents this sequence as /au/. Harris (1994:278, note 52) discusses what appears to be the same vocoid sequence in English and transcribes it as /aw/.
First of all, we will go back to the schematic representation of vocoid sequences, repeated from the beginning of the chapter.

(27) a. +ATR

<table>
<thead>
<tr>
<th></th>
<th>Front</th>
<th>Back</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unrounded</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>iu</td>
<td>yu</td>
</tr>
<tr>
<td>Mid</td>
<td>øu</td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>ai/au</td>
<td></td>
</tr>
</tbody>
</table>

(27) b. -ATR (short)

<table>
<thead>
<tr>
<th></th>
<th>Front</th>
<th>Back</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unrounded</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>ei</td>
<td>øy</td>
</tr>
<tr>
<td>Mid</td>
<td>øy</td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td></td>
<td>au</td>
</tr>
</tbody>
</table>

-ATR (long)

<table>
<thead>
<tr>
<th></th>
<th>Front</th>
<th>Back</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unrounded</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>øi</td>
<td></td>
</tr>
<tr>
<td>Mid</td>
<td>øi</td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Of the vocoid sequences in (27), only the /æu/ behaves in this strange fashion, accepting following non-inflectional coronal consonants with relative ease. In order to understand why, we will compare the representation of /æu/ with that of /ei/ and /øy/. In elements the structure of /ei/ (and the corresponding /ei/) and /øy/ (and corresponding /øy/) is as follows.
The representations above imply that either the element I is uniquely linked to two positions or that all elements are linked to two positions. It also implies that the structure of the head of the rhyme is the same in both representations in (28a) and in (b): it remains respectively (A,I) or (A,U,I). The only thing that changes is the dependent, licensed position in the rhyme. In the sequence-case it shares relatively little material (the element I or U), whereas in the long vowel-case it shares all the elements with the head. Let us compare this with the representation of /au/.

(28) a.  
\[
\begin{array}{c}
R \\
| \\
N \\
| \\
x \\
A \\
| \\
I
\end{array}
\begin{array}{c}
R \\
| \\
N \\
| \\
x \\
A \\
| \\
U \\
| \\
I
\end{array}
\]

(28) b.  
\[
\begin{array}{c}
R \\
| \\
N \\
| \\
x \\
A \\
| \\
U \\
| \\
I
\end{array}
\begin{array}{c}
R \\
| \\
N \\
| \\
x \\
A \\
| \\
U \\
| \\
I
\end{array}
\]

(29)  
\[
\begin{array}{c}
R \\
| \\
N \\
| \\
x \\
A \\
| \\
U
\end{array}
\begin{array}{c}
R \\
| \\
N \\
| \\
x \\
A \\
| \\
U
\end{array}
\]
In the first representation in (29) there are two elements in the vocoid sequence, A and U, but, contrary to /ei/ and /œi/, the U element is only linked to the second, dependent position. This means that the internal representation of the head of the rhyme changes if there would be an alternation between /au/ and /œ/. I will assume that a change in the representation of elemental structure of the dependent, licensed position of the rhyme is acceptable, whereas a change of the elemental structure of the head of the rhyme is not. It is plausible to assume that heads are more stable than dependants. The same situation can be observed with vowel reduction, for instance. The vowel in the head nucleus of a word never reduces, whereas in a licensed position such a phenomenon is widespread. This is illustrated with some examples from Dutch. In /bɔ'nɑn/ (‘banana’), for instance, the vowel in the unaccented syllable often reduces in fast speech ([bɔ'nɑn]). The vowel in the head nucleus cannot undergo such a change of elemental composition (*[bɔ'nan]/* [bɔ'nan]). The same is true of a word such as /ˌekɔnə'mi/ ‘economy’: the vowels in the dependent positions can change into schwa (/,ˌekɔnə'mi/), whereas the vowel in the head nucleus cannot (*ˌekɔnə'ma], *ˌekɔnə'ma]).

(30) Standard Dutch vowel reduction

<table>
<thead>
<tr>
<th>reduced form</th>
<th>‘banana’</th>
<th>‘economy’</th>
</tr>
</thead>
<tbody>
<tr>
<td>bɔ'nɑn</td>
<td>bɔ'nɑn</td>
<td></td>
</tr>
<tr>
<td>ˌekɔnə'mi</td>
<td>ˌekɔnə'mi</td>
<td></td>
</tr>
</tbody>
</table>

In a similar way as the vowel in the licensing nucleus of /banan/ does not change, the head of a vocoid sequence or long vowel does not change even if constraints such as *M/I (OR U) >> *P/I (OR U) or * DIPHTHONG, render the alternative form (/au/) highly marked. This implies that in the mind of the speakers there is a tight connection between these vocoid sequences and their corresponding long lax vowels (that is, between /ei/ and /œ/ and between /œi/ and /œ/). This is not the case for the ‘pair’ /au/ and /œ/. This is the reason why we find more non-inflectional consonants following this vocoid sequence than other sequences. In other words, the non-existence of an alternative form to /au/ is the reason that we do not see a strict complementary distribution between /au/ and some other long vowel in Tilburg Dutch.

There is no reason to assume otherwise: if the elements A and U would both be linked to the head position in the diphthong, the result would be */au/. However, phonetically there clearly is a A-like sound in the first part, whereas in the general structure of the vowel and consonant system there is no motivation for an analysis which departs from this phonetic identity.
3.5.2.2. Tilburg Dutch /au/ before non-inflectional coronals.

/au/ before non-coronal consonants is worse than before coronal ones. This can be related to the special character of these consonants. In Tilburg Dutch a structure such as the one in (31) below – with a non-coronal consonant following the high vocoid – is impossible or at least very rare. This might be due to the fact that this is an undesirable form. U prefers to be in a nucleus in Tilburg Dutch. In (31) U is in a marginal, coda position without an obvious reason – such as the presence of a high-ranking constraint such as FINAL-C.

(31)  *O  R  O  R
      |   |   |
      N   N
      x   x   x   x
      |   |   |
      *C  a  u  C_{non-coronal}

On the other hand it is possible for the high vocoid (/u/ - or the element U) to be followed by a coronal consonant. This suggests that words of a form such as (/C auC_{coronal}/) do not have the same structure as (31).

Coronals are known to have a special status. McCarthy and Taub (1992) observe in their review of Paradis and Prunet (1991) that, although some questions are still unanswered, the common opinion is that coronals are the least marked of all consonants. I propose the phonological representation in (32) for such /C auC_{coronal}/ words. I follow the literature in the assumption that the vocoid sequence in words such as /haut/ ‘wood’ consists of a lax vowel and /u/. I have to assume that /u/ is both in the coda and in the onset position of an empty syllable: if not, the lax vowel would not be followed by a tautosyllabic consonant.

(32)  O  R  O  R  O  R
      |   |   |   |
      N   N   N
      x   x   x   x   x   x
      h   a   u   u   u   (t)

This form is marginally possible because the word-final obstruent is a coronal, which is in some way invisible: it has no skeletal position to which it is attached through A-licensing. The result is as if there is no word-final onset at all.

---

16 In Tilburg Dutch there are other words with a structure in which there is one coronal /h/ ‘too much’, such as the second part of /kerheyst/ ‘troublemaker’. Also in Standard Dutch we have words such as /herfst/ ‘autumn’, in which there are even two coronals extra. In this respect,
Consequently, the /u/ has *some* function after all because it is in some sense word-final (the coronal being only ‘partly’ present). Furthermore, it is a possible phonological structure because the two adjacent empty nuclei are collapsed into one, *word-final*, empty nucleus as a result of the OCP. This solves the problem, because in this language the word-final empty nucleus is by definition licensed. Of course, such a form is, although not as bad as */hæup/, not optimal and therefore rare.

### 3.5.2.3. Standard Dutch /au/

We will now look at the case of /au/ in Standard Dutch. In Standard Dutch, the diphthongs /ei/ and /æi/ can occur before any consonant. If /au/ also were a diphthong, it is strange that this sequence has strict co-occurrence restrictions, that is, it can only co-occur with a coronal. As illustrated in (32b), the diphthong /ei/ can co-occur with almost any consonant in Standard Dutch, just like tense vowels (cf. 33a).

\[(33) \begin{array}{ll}
\text{a. tense vowels} & \text{b. diphthongs} \\
\text{(in word-final syllable)} & \text{(in word-final syllable)} \\
\text{R} & \text{R} \\
\text{N} & \text{N} \\
\text{e} & \text{C} \\
\text{e.g.:} & \\
\text{et} & \text{heit} \\
\text{lek} & \text{leik} \\
\text{bef} & \text{leif} \\
\text{kel} & \text{zéil} \\
\text{etc.} & \text{etc.}
\end{array}\]

The same freedom with respect to the co-occurrence restrictions with following consonants, can be observed with the Standard Dutch diphthong /æi/: it can occur with almost any consonant, just like the tense vowel /ø/, cf. (34).

coronal consonants are different from other consonants. The invisible t-analysis is therefore not ad-hoc; we see some kind of invisibility analysis anyhow.

---

17 In a sequence of two adjacent nuclear points, the first one is deleted as a result of the OCP (Charette 1991)
Clearly, /ei/ and /œy/ seem to have as much freedom to occur with different consonants as tense vowels. In contrast to this, /au/ only occurs word-finally or before coronals, just like vowel+consonant sequences such as /oi/ or /ai/. These sequences only rarely end in non-coronal consonants, for instance /au + k:/ /glauk/ ‘some kind of colour’ and /pauk/ ‘kettle-drum’ and /bauksit/ ‘bauxite’. Of these two words /glauk/ is only very marginally known and /pauk/ is onomatopoeic (according to a Dutch etymological dictionary).

It is remarkable that these Dutch dialects show similar co-occurrence restrictions for /au/. Similar facts have been reported for English as well. In general, only coronal consonants can occur after the diphthong aw in English (Harris 1994:278, note 52; Anderson 1986; Hammond 1999). Some examples in the languages in question are provided in (35) below.

English: /mauθ/, /paut/, /praʊd/, /kraʊn/

I suggest that for Standard Dutch the explanation lies in the fact that this vocoid sequence is not a diphthong but - unlike /ei/ or /œy/ - a vowel+glide sequence or a pseudo-diphthong.18 This may have to do with the consonantal nature of the U element. The fact that /au/ may co-occur with coronals is not problematic: the behaviour of coronals is special, as has been mentioned above.

The representation of words such as /vrau/ (‘woman’) or /kaus/ (‘cold(ness)’) is structurally the same as the representation of ‘normal’ Dutch words as /dɔr/ (‘barren, dry’). Furthermore, the structure of these forms is similar to that of Tilburg Dutch vocoid sequences. The representation of these words is given in (36).

18 I suspect that the explanation for the English data is similar, in that English /au/ is not a diphthong but a vowel+glide sequence.
With ‘normal’ Dutch words such as /dɔr/ there is nothing in principle preventing a word-final consonant cluster. Words such as /dɔrp/ (‘village’), /bɔrɔx/ (‘surety, bale’) and /hɔнд/ (‘dog’) are perfectly regular Standard Dutch words. Such a word-final consonant cluster may end in a coronal but does not necessarily so. In (37) I present the structure of a Standard Dutch word with a word-final consonant cluster.

(37)      O R O R
           / \  \
           x x x x x
           \ / \
           v r a u
           d r

In such a situation the word-final onset position licenses the rhymal adjunct position; since the /p/ or the /d/ in the onset is less sonorous and more complex than the /t/ or the /u/, this is no problem. Why then do we not find a similar structure with words ending in /u/, except when the last consonant is a coronal (/kɔus/ ‘stocking’, /pɔus/ ‘pope’, /hɔut/ ‘wood’, etc.)?

I suggest that /u/ cannot occur in a coda position. It occurs in onset positions, although only marginally. This is why we find some words with onsets in /u/ (in Dutch orthography w) and words such as (/kɔus/ ‘stocking’), which end in a coronal, because of which the /u/ can occur in the onset instead of the coda. It is not clear why exactly /u/ may not occur in coda positions. This is a question for this consonantal analysis of the second part of /au/ vocoid sequences but it also a question for the theory of Dutch phonology in general. Why can’t glides, including
the /u/, occupy coda positions? It is well-known that consonants in Dutch do not as freely occur in codas as they do in onsets but this generally goes in the other direction: the more sonorous a consonant is, the more fit to occupy a coda position. I will not discuss this subject any further here.

There are at least two items which need some further clarification. The special status of coronals and the suggestion that U is the most consonantal of the vowel elements in Dutch need some motivation. The special status of coronals has been discussed in the section on /au/ in Tilburg Dutch. The consonantal character of U is discussed here. First of all, the data are not unambiguous. It appears that the Standard Dutch /au/ is more consonantal than /i/ (cf. Van der Torre 2003). Some independent evidence for this is the fact that, in Dutch, sequences of */ji/ are unacceptable (Booij 1995:42, Janson 1986:192 who claims that in many languages the /j/ does not occur before the /i/). The Dutch constraint against tautomorphemic /ji/ + /i/ is an instance of the OCP (Van Oostendorp 2000:39). That is, words starting with /ji/ start with the element I twice. It is interesting that in the same language /wu/ is well-formed, as in /wudi/ ‘anger’, while */ji/ is impossible. This indicates that /wu/ is not represented by two adjacent U elements. This gets some support by the fact that words starting with a /i/ in the onset in Dutch are limited in number as compared to words starting with a /u/. About 26 pages with words beginning with a /i/ as compared to about 127 pages with words starting with /u/ were found in the standard Dutch dictionary (Geerts 1992). This difference in behaviour of the elements I and U might indicate that U in the onset position is not merely an U element but has something extra, ‘disabling’, as it were, the OCP from doing its job when it is followed by a single U element in the nucleus. It might also be due to a lower sonority of the U element in general. On the other hand, the constraints *M/I (OR U) >> *P/I (OR U) have been introduced above, indicating the preference of both U and I elements for nuclear positions in Tilburg Dutch. This preference for nuclei seems difficult to reconcile with the proposal that, fundamentally, the element U is more consonantal than the I element. This point will not be pursued here any further.

In the next section the last category of possible exceptions to FINAL-C is discussed.

3.5.3. Structure versus no structure or the case of French loans

Of the words, which were called possible exceptions to FINAL-C in 3.3, function words, interjections and exclamations have been discussed. In 3.5.1 I have argued that these are not exceptions since these words are not phonological words. In 3.5.2 I discussed that the Tilburg Dutch /au/ behaves in an exceptional fashion because it has no close alternates. Finally, we come to a class of words for which I will conclude that they constitute exceptions. These are French loanwords ending in /i/.

The examples of (4c) are repeated in (38).

(38)  f'dysi / fidysi  ‘trust’
       m'dasl  ‘medal’
First of all, I will demonstrate that a simpler interpretation of Final-C may also account for the supposedly exceptional French loan words. Then I will argue that this interpretation should be rejected in spite of the fact that this grammar seems more inclusive and simple. The reason that it should be rejected is of a theoretical nature.

Consider the French loans fidysi and plisi. It is clear that they do not satisfy Final-C in its current interpretation. Both words end in a filled nucleus position and not in an onset. The margin constraint, POSS-MAR, cannot be of help: in the constraint reference is made to a margin position, which is, like onset, a structural position. There is, however, no way we can say that the word-final [i] in /plisi/ ‘police’ is in a margin position. On the contrary, it clearly is connected with the nuclear position. From the tableau in (39) below, we deduce that /plisi/ should not surface in Tilburg Dutch.

\[
\begin{array}{|c|c|c|c|c|}
\hline
\text{/plisi/} & \text{POSS-MAR} & \text{FAITH}^{20} & \text{FINAL-C} & \text{*M/I(–U)} & \text{*P/I(–U)} \\
\hline
\text{[plis]} & & \ast \dagger & & & \\
\text{[plisi]} & & \ast \dagger & & & \\
\text{[plisi]} & \ast \dagger & & & \ast & \\
\hline
\end{array}
\]

The form [plisi] fatally violates POSS-MAR and consequently should not be a possible output in Tilburg Dutch; however, it is. If we had a grammar such as the one above, we would have to consider such words to be exceptional.

Suppose we leave out all reference to structure in our constraints (margin, onset or any other reference to structural positions). In such a ‘structure-poor’ grammar the two constraints Final-C and POSS-MAR amount to the same thing, viz. a constraint forbidding words to end in anything more sonorous than the single elements I or U. Let us label this constraint FinalI/U.

FinalI/U: no word may end on a segment more sonorous than that represented by a single I or U element.

In the mini-grammar below, it can be observed that in such a case the i-final French loans are no longer exceptional.

\begin{center}
\footnotesize
\begin{tabular}{|c|c|c|c|c|}
\hline
\text{portensi} & \text{‘pretension’} & \\
\text{plisi} & \text{‘police’} & \\
\text{etc.} & & \\
\hline
\end{tabular}
\end{center}

\footnotesize

\text{20} We need a constraint FAITH to exclude forms with epenthesis or deletion. In earlier tableaux we have left it out, because it was unnecessary. For the same reason I have left out *DIPHTHONG and *LONGVOWEL in the tableaus (39), (40) and (41).
In (40) [plisi] is fine because it consists of nothing more sonorous than single I or U. Furthermore, the mini-grammar based on these new constraints functions also with vocoid-final inputs.

In (41) [bl(ei)ᵢ] is the optimal candidate whereas [ble:] is still excluded since in that candidate the final segment consists of more than single I: it consists of (I,A).

The tableaux above demonstrate that we can dismiss FINAL-C and POSS-MAR, replacing them with something like FINALI/U, a constraint which allows for vocoids word-finally but only if they are no more sonorous than the single elements I and U and irrespective of the structural position, in which such vocoids occur. However, I do not consider this a good alternative for the following reasons.

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Let us repeat the constraints and their interpretations needed in the two alternative potential grammars of Tilburg Dutch. In the first grammar, reference is made to segmental content, structural positions and the relations between the two. These are constraints referring to segmental content and to constituent position. In this respect these constraints may be called ‘vertical’: they crucially refer to structural relations.

<table>
<thead>
<tr>
<th>/plisi/</th>
<th>FINALI/U</th>
<th>FAITH</th>
<th>*M/I (~U)</th>
<th>*P/I (~ U)</th>
</tr>
</thead>
<tbody>
<tr>
<td>[plis]</td>
<td>*!</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[plisit]</td>
<td>*!</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[plisi]</td>
<td></td>
<td></td>
<td></td>
<td>*</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>/blei/</th>
<th>FINALI/U</th>
<th>*M/I (~U)</th>
<th>*P/I (~ U)</th>
</tr>
</thead>
<tbody>
<tr>
<td>[ble:]</td>
<td>*!</td>
<td></td>
<td></td>
</tr>
<tr>
<td>[bl(ei)ᵢ]</td>
<td><img src="https://example.com" alt="image" /></td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>[bl(e)ᵢ]</td>
<td><img src="https://example.com" alt="image" /></td>
<td>*!</td>
<td></td>
</tr>
</tbody>
</table>

In (41) [bl(ei)ᵢ] is the optimal candidate whereas [ble:] is still excluded since in that candidate the final segment consists of more than single I: it consists of (I,A).

The tableaux above demonstrate that we can dismiss FINAL-C and POSS-MAR, replacing them with something like FINALI/U, a constraint which allows for vocoids word-finally but only if they are no more sonorous than the single elements I and U and irrespective of the structural position, in which such vocoids occur. However, I do not consider this a good alternative for the following reasons.

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**FINAL-C**
Word-final segmental material must be licensed by an onset position

**POSS-MAR (πMar=I/U)**
Segments with a sonority greater than $π_{Mar}$ may not be parsed as margins (=onset or rhymal adjunct position/coda)

The second grammar has only one constraint. This grammar has a ‘horizontal’ orientation: only the sequence of segments is referred to:

**FINALI/U**
No word may end on a segment more sonorous than that represented by a single I or U element.

One objection to the horizontal FINALI/U grammar is that it is not restrictive enough. If no reference is made to structural positions, things become arbitrary. For instance,
there is no reason why one could not just as easily suggest that there is a language in which words have to end in something less sonorous than a /b/ or /r/; or that segments in the middle of a word can never be more sonorous than a /p/. It is of course highly improbable that such a language exists. If on the other hand, reference to structure is made – if for instance, the constraint (or rule) affects a margin (onset or coda) or a nucleus – a constraint such as the one on /b/ or /r/ or /p/, would be impossible. This is so, because the universal sonority preference laws for constituents such as onset and coda exclude such a constraint.

There is also a more fundamental objection to such structure-less constraints as F\textsc{inal}/I/U. Constraints are part of a grammar and the analysis of a grammar or grammars should give insights in important aspects of language. If we make use of the constraint F\textsc{inal}-C, reference is made to requirements on the level of segmental structure, of constituent structure and to the notion of sonority. Consequently it provides insights into these structures. The following case illustrates this.

It is well known that sonorous segments prefer to be in a nucleus and occupy a margin position only when some other requirement forces them to do so. Tilburg Dutch is such a language. Consider a Tilburg Dutch input /kat/ ‘cat’. This is in many respects an optimal phonological form: the (initial and final) onsets are occupied by two voiceless stops (i.e. of no sonority), whereas the nucleus is occupied by a vowel – a highly sonorous segment. Such a word is an optimal realization of the requirements on the level of constituent structure: the word begins and ends in an onset and the onset is filled with non-sonorous material. Similarly, the form is an optimal realization of the preferences of the segments: non-sonorous segments such as /k/ and /t/ prefer a consonantal margin position and a sonorous segment such as /a/ prefers to occur in the nucleus. No compromise between requirements on the level of constituent structure and requirements on the level of segmental structure is required.

A compromise is often necessary: if the segments in question consist of only vowels or only consonants, one of those may sometimes accept a less optimal choice. Consider the input /izxr / ‘year’. In such a word two vocoids (with a relatively high sonority) are present: /i/ and /x/. The second vowel is long: it occupies two positions. In such a situation a compromise is necessary. In this language, the requirement on the level of constituent structure requires the word to begin with an onset. There is only an /i/ present as first segment; it prefers to be in the nucleus (one of the demands on the segmental level). In this case the demand on constituent structure for words to begin with an onset, outweighs the demand on segmental preference, requiring vowels (even high ones) to be in the nucleus. Therefore, the word is pronounced with an initial glide, /jaoə/ ‘year’. Of course this is a gross simplification of the facts. My aim is merely to illustrate the necessity of having grammars which refer to vertical structural relations and the way the vertical and horizontal dimensions are mapped on each other. From the discussion I conclude that French loanwords are best analysed as exceptions to F\textsc{inal}-C.

\textsuperscript{21} The entire discussion of this subject draws heavily on Prince & Smolensky (1991).
3.5.4. Sonority

As sonority plays an important role in this chapter, I will dedicate the next paragraphs to a discussion of this notion. Most scholars agree that sonority plays an important role in many diverse and very common phonological phenomena. Yet there is little agreement about what sonority is and what the representation of it should be. A simple version of the sonority hierarchy is given in (42).

(42) vowels glides liquids nasals obstruents
    most sonorous           →           least sonorous

As straightforward as such a hierarchy might seem, it is difficult to find a clear phonetic correlate. This is one of the reasons why Van der Linde (2001) calls sonority a purely phonological or structural notion - it has more to do with the structure of phonological units, such as the syllable or the word than with phonetic (articulatory or auditory) characteristics.

This subject received some attention when I discussed lenition processes in Dutch in Chapter 2. I have argued that such sonority related phenomena can be quite adequately ‘covered’ by complexity in the GP view of Harris (1994). The more complex a segment is, the less sonorous it is and the more prone to lenite in a weak position. This is an advantage of GP over other theories: the sonority hierarchy is as it were, already present in the structure of the segment in terms of complexity. An example of such a lenition process in Tilburg and Standard Dutch is the process by which a voiced coronal obstruent (/d/) becomes a glide (/j/) foot-internally. This can be considered a process of decomposition: the segments become less complex. This is illustrated by the Standard Dutch facts in (43).

(43) rodə / rojə ‘red’
    radə / rajə ‘to guess’
    dodə / dojə ‘dead’

In an elemental representation this would be something like:

(44) d > j
    x  x
    |  |  
    h  |
    |  R  
    |  I  
    |  L
In (44) the segment clearly becomes less complex. In this chapter we have come across another instance of a sonority-related process. I refer to the sonority-related scalar difference, not only between stops and vowels but also, in a more subtle fashion, between vowels, such as /i/ and /a/. We have followed Prince & Smolensky (1991) and proposed a requirement that in Tilburg Dutch the segment /i/ (or /u/) is the most sonorous element which can occur in a margin position (i.e. POSS-MAR ($\pi_{Mar}= I$)). This constraint refers to a sonority hierarchy in which the vowel /a/ (represented by element A) is more sonorous than /i/ (element I) which in turn is more sonorous than any consonant.

The determination of optimal margin (onset and coda) segments and optimal nuclear segments seems harder to express in GP. Complexity will not prove satisfactory here. The problem is evident in at least two cases. A hierarchy going from extreme margin-preference to extreme nucleus-preference cannot be easily expressed in the framework of Harris (1994). In this framework sonority is expressed as ‘lack of complexity’: the more sonorous a segment is, the less complex its representation and vice versa.\footnote{Rice (1992) also connects complexity and sonority but in the inverse way. That is, in both views sonority is encoded in segmental structure itself, in segmental complexity, but in Rice greater sonority implies greater complexity. The principle in both approaches is the same: sonority is expressed in terms of complexity.} I will discuss in some detail the problems connected to Harris’ (1994) proposal. If (high) sonority is lack of complexity, it makes sense that for instance /p/ has three elements in its representation and /a/ one, as in (45).

\begin{equation}
\begin{array}{c}
\text{p} \\
\text{a}
\end{array}
\end{equation}

\begin{equation}
\begin{array}{c}
\text{x} \\
\text{x} \\
\text{h} \\
\text{A} \\
\text{U} \\
? \\
\end{array}
\end{equation}

However, when we compare /a/ with the representation of consonants such as /r/ or /l/ the story becomes less clear. All these segments consist of only one element, R, ?, and A, respectively. However, nobody would deny that /r/ and /l/ are consonants and less sonorous than the vowel /a/. A vowel such as /e/ would even have more elements and would therefore be more complex and less sonorous than consonants such as /r/ and /l/. One can hardly imagine a language in which there is a rule or constraint saying that a nucleus should consist of that /r/ and /l/ rather than of the vowel /a/. The same is true of two vowels, such as /e/ and /i/. Although the first vowel is more sonorous than the second, the last one is less complex.
One of the problems is that the GP representation of Harris (1994) includes more factors than sonority. These factors contribute to complexity while they are not relevant for sonority. Take for example place. As far as place is concerned, a segment such as /e/ could very well be represented as a combination of the elements I and A. This would however make the vowel in question more complex and thus less sonorous than the /i/, which is quite contrary to known typological facts.

It is not only the case that many elements not relevant to sonority, are contributing to the complexity of a segment, but it is also the other way around: not every factor relevant to sonority is included in the representation. It appears that continuancy is relevant for sonority. Lenition phenomena in which obstruents such as /p/ or /t/ historically change into /f/ and /s/ are widespread. In Harris’ framework this can be expressed as a loss of complexity, as illustrated in (46).

(46)  
\[ t \rightarrow s \]

\[
\begin{array}{c|c|c}
X & X & \hline \\
| & | & \\
H & H & \\
| & | & \\
R & R & \\
| & ? & \\
\end{array}
\]

This is a case in which an obstruent becomes more sonorous through the loss of ‘stopness’ and/or the increase of continuancy (structurally the loss of the element ?). A phenomenon which we may analyse as having to do with continuancy occurs in Tilburg Dutch. In this dialect Fnal-C is satisfied if the word ends in a margin-position. For instance a final onset occupied by a high vocoid (element I or U). This is a second-best solution, since these high vocoids prefer to occur in a nucleus. However, the vocoid /a/ (A in elemental terms) not only prefers to occur in a nucleus, it is also completely disallowed in a margin position. Thus, there is a difference between the vowels /i/, /a/ and /a/ – or elements I, U and A – in this respect. One may assume that the difference between vowels such as /i/ and /a/ – or the elements I and A – is mainly one of sonority. With the element I there is more closure and therefore less continuance, than with A. One might think of this difference as one on the same scale as the difference between /p/ and /f/: going from /p/ to /f/ is like going from /a/ to /s/. It goes from non-continuous to somewhat continuous to even more continuous, etc. There is no way to express this in GP.

While the elemental structure functions very well in many respects, the structural representation of vowels and consonants needs something more. What we need is an expression of what I have called here ‘continuancy’ or stridency. In the literature one can find a relevant proposal: Radical CV Phonology (among others,

---

23 See Rice (1992) and work cited therein for arguments that place is not part of the sonority dimension. This contrary to for instance Selkirk (1984) who argues that place can be part of the sonority scale.
Van der Hulst 1995, Ewen and Van der Hulst 2001). Van der Hulst (1995) uses C for a relatively high degree of stricture and V for an unimpeded outflow of air (as in sonorants). In this way one can analyse the sonority hierarchy from the most open vowels to the most ‘closed’ obstruents. However, it also has another advantage. Harris (1994) states /i, a, u/ to have the most simple structure of the vowels, a structure consisting of the elements I, A, and U only. These are the most unmarked vowels universally. However, the ‘primary’, unmarked consonants, the voiceless stops, have a complex structure. This is a consequence of the fact that the elemental structure also represents sonority. If we take sonority out of the elemental representation as found in Harris (1994), we can present stops as the most unmarked consonants (cf. Van der Hulst op. cit.).

In other words, at least two important factors determine where a segment might be found. In the first place, the factor of complexity: licensing positions demand a higher complexity of its segments than licensed ones. In the second place, there is the factor of C/V, consonantness/vowelness, stridency/sonority: in licensed positions, a C or V can become more C-like or more V-like depending on the surrounding context.

I do not want to go into the details of the theory presented in Van der Hulst (1995). However, I think that the solution to the problem of how to represent the processes which are connected with sonority, lies in the approach which represents sonority as relating to ‘vowelness’, V. Non-sonority or extreme stricture can be seen as ‘consonantness’, C. Consonantal lenition can then be considered to be assimilation: an intervocalic consonant assimilates to the vowelness, i.e. the sonority, of the surrounding vowels (cf. 47).

\[(47) \quad V \quad C\alpha \quad V \quad \rightarrow \quad V \quad V \quad V \quad |\quad C\alpha \quad (Van \: der \: Hulst \: 1995:101)\]

In such a view, the representation of lenition in (43) and (44) implies that a consonant assimilates to the surrounding vowels by becoming more vowel-like. The opposite process, Final Devoicing (cf. Chapter 6), can be considered to be a process in which a voiced stop becomes more consonant-like. As expected both processes only occur if the relevant positions are weak (licensed).

In this section I have motivated my choice for \textsc{Final-C}, a constraint referring to structural relations as well as to segmental content, over that for \textsc{Final/I/U}, a constraint referring to segmental content and sequence only. I have also discussed the way in which sonority is an important item in the selection of /a/ over /i/ for a nucleus. I have argued that in GP this subject might need more attention. \textsc{Final-C}, itself, deserves further study. Its controversial character makes it important to demonstrate that it does not only show up in the case of the diphthong/monophthong distribution in Tilburg Dutch.
3.6. Support for FINAL-C

3.6.1. Diphthongs in other Dutch dialects

This chapter started with a discussion of diphthong-like structures in Tilburg Dutch. I have attempted to show that the behaviour of vocoid sequences in this dialect can be accounted for by the high-ranking of the constraint FINAL-C in this dialect. We will now consider similar phenomena in other Dutch dialects.

It is interesting that Dutch shows a large variation as far as the dialectal distribution of diphthongs is concerned. Standard Dutch is commonly assumed to have three diphthongs: /ei/, /øy/, and /au/ - I abstract from my own conclusion in section 3.5.2. that /au/ actually is not a true but a pseudo diphthong. Historically their predecessors are the following (cf. Van Bree 1987, Van Loon 1986, Boutkan & Kossmann 1996).

\[(48)\]
\[
\begin{align*}
ei & \prec *ai, *i \\
au & \prec *u \\
øy & \prec *iu, *u
\end{align*}
\]

For our purposes it is not relevant to discuss the different reflexes of these Westgermanic forms in detail. I will make some remarks, however, with respect to role of FINAL-C and its relation to diphthong-like constructions in Dutch dialects.

Weijnen (1991) discusses diachronic and synchronic Dutch dialectal phonology. He mentions that in many Dutch dialects (including Standard Dutch), West-Germanic long /iː/ and /uː/ have become diphthongs. This was the case in the dialects of the Holland and Utrecht area as well as the southern central parts of the Dutch language area. The monophthongs /iː/ and /uː/ remained monophthongal in the north- and south-eastern parts of the Dutch language speaking area (from the province of Groningen to the eastern part of the Limburg province) and the south western dialects (French- and West Flanders and the Dutch province of Zeeland) (cf. Weijnen 1991:252, map 11 and Goossens et al. 2000). Interestingly, in the eastern parts – where the monophthong is still present – a vocoid sequence generally occurs word-finally. Of course, this word-final context is not the only factor in diphthongisation; Weijnen (1991) mentions other factors as well. As the present chapter is dealing with FINAL-C, I will restrict myself to that topic.

Goossens et al. (2000) discusses, among other things, the vowels, including what they call ‘diphthongs’ in Dutch dialects, on the basis of the West-Germanic proto-forms. With respect to the West-Germanic /iː/, we find that in the north-eastern part of the Dutch speaking area – in the provinces of Groningen and Drenthe – the vowel is monophthongal when it is not word-final. If we look at specific places in

\[24\] West-Germanic *ai has shown a more complex development; I will not discuss its reflexes here.
that area, for instance Aduard, Sint Annen and Roderwolde, we find a long or short /i/ as the equivalent of Standard Dutch /ei/. Consider the following examples.

(49) Roderwolde Aduard Sint Annen Standard Dutch
    fin fin fin fin
    listør listør listør listør

However, in the equivalents of the Standard Dutch vrijen ‘to make love’, we find an /ei/. In Goossens et al. (2000) the position of this /ei/ is called ‘hiatus position’. In the terminology of this thesis, this is an internal or lower word position: the lower phonological word, corresponding to the morphological stem /vrEi/ without the inflectional, infinitival suffix /«n/ for infinitive. The following representation makes this clear (see also chapter 5).

(50) Morphological Structure:     \[ [vrei]_V \ n \ ]_V
    Phonological Structure:        \( ((vrei)_o \ n \ )_o \)

(50) shows that the vocoid sequence occurs at the end of the phonological word – the word without inflection. This means that FINAL-C is active in the domain of the phonological word without adjoined inflectional material (see Chapter 5). Apparently there is a complementary distribution between the /iù/ and the /Ei/: the first occurs word-internally and the second word-finally. I propose that /Ei/ in this dialect is not a true diphthong. The high-ranking constraint FINAL-C forces the high vocoid in a consonantal position.

We will now go from the north-eastern part of the Dutch language area to the south-eastern part. According to Weijnen (1991) a ‘diphthong’ often occurs in hiatus or word-final position in the eastern parts of the monophthongal area (where the /i/ and /u/ remained monophthongs). An instance of a south-eastern dialect is Meijel – a dialect spoken in Dutch Limburg, not far from Northern-Brabant. Hermans and Crompvoets (2002) discuss the phenomenon of palatalization in this dialect as a compensation for the reduction of diphthong-constructions. I will not attempt to present their analysis but will present some of their examples.

Hermans and Crompvoets show that the dialect of Meijel has palatal consonants where the standard dialect has coronal ones.

(51) Meijels Standard Dutch
    [i’s] [eis] ‘ice’
    f[im] f[ein] ‘nice’

---

25 In the north-eastern dialect this suffix generally consists of a syllabic nasal only, without a schwa. In Standard Dutch, this suffix is a schwa, without a nasal. For the analysis here this is of no importance.
This palatalization cannot be the result of assimilation, as non-palatalized consonants also occur after these vowels.

\[(52)\] 
\[
\begin{array}{ll}
\text{z[i]s} & \text{‘six’} \\
\text{p[r]nne} & \text{‘spiders’} \\
\text{k[y]sse} & \text{‘pillow’} \\
\text{k[y]nning} & \text{‘king’}
\end{array}
\]

The essence of their analysis is that palatalization in this dialect is an instance of the tendency to avoid diphthongs, while keeping the [+high] element. This element is attached to the following consonant, if this is a coronal. However, the fact that diphthongs, even though they are rare, do actually occur in this dialect is a problem for their analysis. They suggest that a solution could lie in the fact that diphthongs occur word-finally (cf. 53).

\[(53)\] 
\[
\begin{array}{ll}
\text{sn[e]}i & \text{‘cut’ (1 s.)} \\
\text{v[l]e}i & \text{‘flatter’ (1 s.)} \\
\text{[e]}i & \text{‘egg’}
\end{array}
\]

Hermans and Crompvoets suggest that these diphthongs occur because of a high-ranking constraint, preventing segments from changing word-finally. This prevents underlying diphthongs from being realized except in these contexts. Draye (2002) remarks that this is contrary to the historical facts. Dutch diachronic phonology shows, according to Draye, that diphthongisation does not occur less often but on the contrary, more often before hiatus, including pause. Thus it seems probable that these diphthongs occur word-finally in this dialect because of the high-ranking constraint FINAL-C.

As a final illustration of FINAL-C and its apparent role in the complementary distribution between monophthongs word-internally and (pseudo-) diphthongs word-finally in Dutch dialects, I have included two maps: one of the equivalents of English ‘pipe’ (Standard Dutch /peːp/) and one of the equivalents of English ‘free’ (Standard Dutch /vrēi/). The dots indicate the presence of diphthong-like constructions. It is evident from these two maps that word-finally a diphthong-like construction is much more frequent than word-internally: the difference is quite striking, especially in the eastern part. This is, I suggest, partly a result of FINAL-C.

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26 I thank Boudewijn van den Berg for these maps, as well as for the map in the first part of Chapter 1.
Map 2. Occurrence of word-internal diphthong /ei/ of Dutch, as in Dutch /peip/ ‘pipe’ (source GTRP dialect transcriptions 1980-1995)

This monophthong /pseudo-diphthong distribution is not the only indication of FINAL-C in Dutch. Below I provide evidence from the dialect of Tilburg Dutch as well as from other dialects, such as the dialect of Groningen in the north-eastern part of the Dutch language area, as well as, remarkably, from Standard Dutch.

3.6.2. Other phenomena supporting FINAL-C

3.6.2.1. FINAL-C: Dutch dialects and placeless consonants

Not only the distribution of diphthongs but also the behaviour of /t/ indicates the relatively high-ranking of FINAL-C in Tilburg Dutch. As argued in Van Oostendorp (2001), the /t/ shows chameleonic behaviour with respect to consonantality. The more consonantal the position, the less sonorous the realisation of /t/ is. The author claims that the /t/ is particularly sensitive to such a constraint because it is not predetermined for place.

In Tilburg Dutch, the /t/ is classified as a fricative by Boutkan & Kossmann (1996). However, if one looks at the data in their book, it seems that the picture is less straightforward. That is, the /t/ in Tilburg Dutch does indeed show chameleonic behaviour: sometimes it behaves as if it were a sonorant, sometimes it behaves as if it were a fricative. As we would expect its behaviour is more consonant-like and thus more fricative-like, if it is word-final; when not word-final, it behaves like a sonorant.

In (54) and (55) I give some examples in which the /t/ behaves as a fricative. In these cases, the /t/ is word-final, except for an inflectional coronal obstruent. With respect to these inflectional coronals I claim that they are outside the phonological word proper in Tilburg Dutch (cf. Chapter 6). In (54) /t/ patterns with fricatives in that in words ending on fricatives and /t/, vowel shortening in certain inflectional forms is unnecessary or even impossible.

(54)    bleː:və  ‘to stay’  hei bleft/bleːft  ‘he stays’
    drɔːɣə  ‘to carry’  hei drɔːxt  ‘he carries’
    vɛːɾə  ‘to spring’  hei vɛːɾt  ‘he/it springs’
    hʏːɾt  ‘to hear’  hei hʏːɾt/hʏːɾt  ‘he hears’
    versus:
    lʊːpə  ‘to walk’  hei lupt  ‘he walks’
    stʊtə  ‘to push’  hei stut  ‘he pushes’
    bɛːnə  ‘to tie’  hei bent  ‘he ties’
    vɛːɬə  ‘to file’  hei velt  ‘he files’

(Boutkan & Kossmann 1996:37)
In (55) /r/ final stems pattern with /v/ and /ɣ/ final stems in that they always have a -t ending whereas verbs ending on /p/, /k/, /m/, /n/, /n/, or /s/ (with vowels /u/, /ʊ/, /i/, /ɪ/ there is variation).

\[(55) \begin{align*}
\text{yei blîft} & \quad \text{‘you stayed’} \\
\text{yei buxt} & \quad \text{‘you bowed’} \\
\text{yei vâlûrt} & \quad \text{‘you lost’} \\
\text{versus:} & \\
\text{yei klûm / klûmt} & \quad \text{‘you climbed’} \\
\text{yei dwûŋ} & \quad \text{‘you forced’} \\
\text{yei wûs / wûst} & \quad \text{‘you showed’}
\end{align*}\]

(Boutkan & Kossmann 1996:65)

For the moment, I have nothing to say on the question as to why stops pattern with sonorants.\footnote{A connection between stops and sonorants is that both are [–continuant] in contrast to fricatives, which are [+continuant].} This seems exactly opposite to what we expect. What is relevant at the moment, though, is that, in word-final position the /r/ patterns with fricatives and not with sonorants. Below I will give some examples, in which the /r/ patterns with sonorants.

\[(56) \begin{align*}
a. \text{kærøf} & \quad \text{‘basket’} \\
\text{êrøm} & \quad \text{‘arm’} \\
\text{kåløf} & \quad \text{‘calf’} \\
\text{kalûm} & \quad \text{‘calm’}
\end{align*}\]

(Boutkan & Kossmann 1996:36)

b. after /m/, /n/, /ŋ/, /l/, /l/, /w/: /zo/ (3 s. enclitic)

\[(\begin{align*}
\text{vil-zô} & \quad \text{‘did she fall down?’} \\
\text{yur-zô} & \quad \text{‘did she sail?’} \\
\text{rest: /sø/} & \\
\text{lip-sô} & \quad \text{‘did she walk?’} \\
\text{blîf-sô} & \quad \text{‘did she stay?’} \\
\text{yûsû} & \quad \text{‘does she go?’} \\
\text{re-sô} & \quad \text{‘did she drive?’}
\end{align*})\]

(Boutkan & Kossmann 1996:71)

Even though not all details are clear, it is evident that the behaviour of Tilburg /t/ is forced by Final-C to pattern with fricatives when it is word final and with sonorants elsewhere. That is, in this dialect not only the distribution of diphthongs and long lax vowels show the force of Final-C, but also the properties of the /t/.
It has been argued that in Tilburg Dutch the consonant /r/ shows chameleonic behaviour with respect to consonantality. The more consonantal the position, the less sonorous its realisation is. The /r/ can be considered to be especially sensitive to such a constraint because it is not predetermined for place. This seems to be the case not only for Tilburg Dutch, as I have demonstrated in the preceding paragraph, but also for both Groningen Dutch and Maasbracht Dutch, as I will demonstrate presently.

In Maasbracht Dutch FINAL-C plays a role in the realisation of /r/ and /ŋ/: both these consonants are placeless; consequently FINAL-C can determine the realisation as an obstruent word-finally and as a sonorant word-internally (Van Oostendorp 2001). The same is true of Groningen Dutch. Note, for that matter, that both dialects are spoken in the eastern part of the Dutch speaking area – where Weijnen (1991) notes a preference for monophthongs word-internally and diphthongs word-finally. It is not surprising then, that in these dialects FINAL-C has an influence on the realisation of a placeless consonant such as /r/.

3.6.2.2. Maasbracht Dutch

Hermans (1994) discusses the dialect of Maasbracht Dutch. This dialect has two tones, usually called a falling tone and a dragging tone. The falling tone begins with a high pitch which swiftly falls (high-low). The realisation of the dragging tone depends on its position in the word: it is a level, high tone when it is followed by another syllable in the utterance. When it is utterance-final, the first part of the tone is falling and its second part rising (high-low-high). Some examples can be found in (57).

(57) falling tone dragging tone
    bii ‘bee’           bii ‘at’
    buu ‘to build’      buu ‘construction’

(Hermans 1994:283)

There can only be a tonal contrast if there are at least two sonorants. In (57) we have seen minimal pairs with (long) vowels. In (58) we find minimal pairs with short vowels and sonorant consonants. As can be seen in (58b), no tonal contrast is possible when an obstruent follows the short vowel.

(58) a. falling tone dragging tone
    mīn ‘minus’          mīn ‘vile’
    mǝl ‘to break’       mǝl ‘mole’

b. pǝt ‘kernel’
    tǝs ‘bag’

What is striking is that in word-final position, the /r/ and the /ŋ/ are not tone-bearing units (cf. (59)). In a manner of speaking, they behave as if they were obstruents
instead of sonorants. This is not the case in word-internal position: /er.ɣər/ ‘worse’ and /er.ɣər/ ‘to annoy’ have distinct patterns - the first a falling and the second a dragging tone (Van Oostendorp 2001).

(59)  stranje ‘severe’
      ston ‘stood’
      krin ‘bitch’
      vær ‘far’

Van Oostendorp (2001) suggests that /ŋ/ and /r/ are both placeless consonants. Therefore FINAL-C is at liberty to take up the most consonantal realisation of /ŋ/ and /r/ in the final consonantal position in the word.

3.6.2.3. FINAL-C in Groningen Dutch

Humbert (1996) notes a similar phenomenon in the Dutch dialect of Groningen. In this dialect the /r/ is deleted - that is, it becomes vocalised - before labial and velar consonants. However, before coronal consonants or word-finally the /r/ generally is realised.

(60) /r/ before coronals:
    /bɔːrd/ [bɔr] ‘beard’
    /hird/ [irt] ‘fireplace’
    (but e.g. [swat] (without r) ‘black’)

    /r/ before labials and velars:
    /arm/ [am] ‘arm’
    /stɔrm/ [stɔm] ‘storm’

(Schuringa 1923:53-59)

Humbert (1996:151) argues that these distributional facts have resulted from the tendency in Dutch to have word-final syllables end in a coda. Although she does not mention a FINAL-C constraint, her analysis clearly amounts to the same thing.

3.6.2.4. Standard Dutch and FINAL-C

Even though a constraint such as FINAL-C does not really play an important role in output structures of Standard Dutch, its presence in the language is clear. For instance, according to Trommelen and Zonneveld (1989:154) Standard Dutch diphthongs ei/i, ui and ou/au (e/i’, /œi’, and /au/) are more frequent in final syllables than non-finally. However, contrary to Tilburg Dutch, they occur word-
internally as well. This indicates that the constraint FINAL-C plays a role in the standard language, but that this role is less prominent than in a dialect such as Tilburg Dutch (and others, see below). Though the influence of FINAL-C is less marked in Standard Dutch than in other Dutch dialects, a principle amounting to something like FINAL-C is mentioned by quite a few authors, long before McCarthy (1993) formulated this constraint.

Zonneveld (1975, 1976) argues for a morpheme structure constraint disallowing (underlying forms of) monosyllabic native noun stems ending on a vowel - that is, they end either in a consonant or in a glide. In Zonneveld (1978) it is mentioned that, independently, this constraint is already given in Kruisinga (1938/9), and is hinted at in Van Ginneken (1934-1935:9-10): ‘Also word finally all vowels are relatively rare’. Kruisinga does not discuss the difference between underlying forms and surface representations in this respect. We may assume that he claims this to be true of the words as he observes them in the language. According to Kruisinga, the high amount of words ending in a consonant is not only observed in Dutch but also in English and German, although less so in English. In French, Kruisinga states, words are more often vowel-final than consonant-final.

Zonneveld (1978) mentions a small class of Modern Dutch verbs with monosyllabic infinitives, e.g. the verbs *doen* ‘to do’, *gaan* ‘to go’, *slaan* ‘to beat’, *staan* ‘to stand’, and *zien* ‘to see’. These common verbs appear to use the consonant-final forms as stems in derivational morphology (instead of the first-singular forms/’true’ stem forms such as *doe*, *ga*, *sla*, *sta*, and *zie*, respectively). Examples can be found in (61).

\[
\begin{align*}
\text{ondoenlijk} & \quad \text{‘unfeasible’} \\
\text{weldoener} & \quad \text{‘benefactor’} \\
\text{begaanbaar} & \quad \text{‘passable’} \\
\text{onverslaanbaar} & \quad \text{‘unbeatable’} \\
\text{buitenstaander} & \quad \text{‘outsider’} \\
\text{voorziening} & \quad \text{‘provision’}
\end{align*}
\]

\[(Zonneveld 1978:90-91)\]

---

28 Supposedly this morpheme structure constraint would be true for underlying forms, such as /kui/ and /vloi/. To arrive at the surface /ku/ and /vlo/ (‘cow’ and ‘flee’, respectively) Zonneveld proposes a rule of final glide deletion. This form suggests a constraint in the standard language which is higher-ranking than FINAL-C and which forces its violation.

29 Kruisinga (1939) mentions that, although monosyllabic words in Standard Dutch rarely begin with a vowel, it is even more rare for them to end in a vowel. This would not only imply a high-ranking of the constraint ONSET - as is commonly assumed to be the case cross-linguistically - but in Dutch also of the constraint FINAL-C.

30 ‘Ook aan het woordeinde zijn alle vocalen betrekkelijk zeldzaam’

31 Golston and Wiese (1998) state that 96% of the German roots are consonant-final. According to the authors FINAL-C that accounts for this. According to the authors 94% of their corpus consists of consonant-initial roots.
Van Oostendorp (2000) suggests that the schwa-epenthesis, occurring in words such as /mElk/ ‘milk’, /kErk/ ‘church’ - pronounced as /melk/ or /melak/ and /kerk/ or /kerak/ - is determined to occur within the word and not word-finally because of this constraint. A word such as *[melka] is according to Van Oostendorp structurally better than [melak]. However, because of Final-C the less-preferred syllable structure is actually the attested one.

Zonneveld (1978) gives evidence for his Final Vowel Constraint from historical change in Dutch. He mentions stems of nouns and verbs which have changed from an open (mono-)syllable to a closed one at a later stage. Nouns such as *ka ‘crackling’, *pee ‘carrot’, *schoe ‘shoe’ and *tee ‘toe’ saw their plurals kaan, peen, schoen, and teen being reinterpreted as stems after Middle Dutch (Zonneveld 1978:91; Franck and Van Wijk 1949). This reinterpretation gave rise in its turn to the Modern Standard Dutch plurals kanen, penen, schoenen, and tenen.

Another, diachronic, indication of the Final-C constraint is that, according to Zonneveld (1978:91) the past-tense consonant became generalised throughout the paradigm, in Middle-Dutch verbs that show an alternation between a monosyllabic open-syllable present and a closed syllable preterite, e.g. hangen ‘to hang’ (<*haen), plegen ‘to commit’ (<*plien), tijgen ‘to move’ (<*tien), and vangen ‘to catch’ (<*vaen) (Zonneveld 1978, Schönfeld and van Loey 1970). That is, instead of on a final vowel stem such as *va- ‘(to catch)’ the entire paradigm was based on the closed syllable preterite form (van-).

As a last point, Zonneveld mentions that a (hypercorrectly working) process of contraction has produced a reanalysis of the stem, from an open syllable to a d-final closed syllable (e.g. the verb geschieden ‘to happen’ (<*geschien)).

In Dutch dialects, especially those in the eastern part of the Dutch language area, the influence of Final-C is noticeable in more than one domain. This supports the analysis of the complementary distribution between monophthongs and pseudo-diphthongs which I proposed for Tilburg Dutch in section 3.4. In the following section I will demonstrate that the influence of a constraint such as Final-C is noticeable in other languages as well. I begin with English, the language and the data which brought McCarthy (1993) to the formulation of this constraint in the first place.

3.6.2.5. Other languages and Final-C

As we will see below, there seems to be some evidence for Final-C in non-Dutch languages such as Yapese, Axininca Campa, Choctaw, colloquial Arabic, Lardil, and Tunica. As yet Final-C has not been related to diphthongs. The constraint is formulated for the first time by McCarthy (1993), who uses this constraint to account for something different: that is, for intrusive-r phenomena in Eastern Massachusetts American English. Some examples can be found in (62).
The generalisations are as follows. The consonant /r/ doesn’t occur utterance-finally or before a consonant but must be followed by a vowel in the same utterance (cf. (62b) vs. (62d)). Furthermore, the vowels /a/, /ə/, and /ɛ/ cannot be followed by a vowel in the same utterance: if such a situation would occur, an intrusive /r/ appears (cf. (62a) vs. (62c)).

Before McCarthy (1993) came forward with his analysis, the distribution of /r/ was assumed to be syllabically conditioned. On the one hand, /r/ is deleted if it is the syllable-final consonant. On the other hand, /r/ was considered to resolve hiatus, by separating two adjacent heterosyllabic vowels. The phenomena were considered to be a response to two constraints regarding syllabic wellformedness: CODA-COND (McCarthy 1993, Itô 1986, 1989) and NO-HIATUS. The first constraint prohibits /r/ in a post-nuclear position or forces it to be in the onset while the second one prohibits heterosyllabic vowel-vowel sequences.

McCarthy (1993) argues that an analysis on the basis of CODA-COND and NO-HIATUS cannot account for all the data. After function words, NO-HIATUS is violated freely (e.g. to → add, the → appel), meaning that we need yet another constraint to account for the facts. For this purpose, McCarthy proposes the constraint FINAL-C. This constraint has the phonological word as its domain and not the syllable. Following the generally-accepted assumption that lexical words, contrary to function words, are parsed as phonological words, it is to be expected that intrusive /r/ occurs after a lexical word and not after a function word (such as to or the). Compare the examples in (62c) above (repeated here for convenience sake in (63a) with the examples in (63b). In (62a) spa, tuna, and yaw, are lexical words and consequently parsed as phonological words. As such they are required to end in a consonant - by the high-ranking of FINAL-C - resulting in r-intrusion. On the other hand, neither to, do, nor the are phonological words, which makes FINAL-C irrelevant. This way FINAL-C accounts for the presence of /r/ in (63a) and the absence of /r/ in (63b).
(63) a. *Intrusive-r after lexical words (thus, phonological words)*
   The spar is broken
   He put the tunar away
   The boat’ll yaw a little

(63) b. *No intrusive-r after function words*
   To(*r) add to his troubles
   Why do(*r) Albert and you …
   The(*r) apples

(McCarthy 1993:173,174)

McCarthy (1993:178) refers to other cases in the literature, where versions of this constraint can be observed. He mentions for instance Yapese (Piggott 1991:304), Axininca Campa, Choctaw and colloquial Arabic (for references on these languages, see McCarthy 1993). In Arabic, for example, noun and verb stems must end in a consonant. I will illustrate FINAL-C in somewhat more detail in two other languages, Tunica, a ‘native’ American language (Lombardi 1998) and Lardil, a Pama-Nyungan language of Australia (Prince & Smolensky 1991:97 ff.; McCarthy 2002).

First we will look at the case of Tunica, an American Indian language (Lombardi 1998, referring to Haas (1940)). In this language, we find epenthesis of /n/ phrase-finally. According to Lombardi (op. cit.) this epenthesis is due to PHRASE-FINAL-C (phonological phrases should end in a consonant).

This case is not only an example of a language where ‘plain’ FINAL-C is relevant. It also illustrates that FINAL-C does not necessarily concern phonological words only. It appears that some languages, such as Tunica, want phonological phrases to end in consonants - while others want lower phonological words (the word without affixes) to have such an ending, as we will see in Chapter 5. That is, apparently this constraint can be parameterised for different phonological domains. In Tunica, then, the domain is the phonological phrase.

(64) regular form phrase-final form
    hatika  hatikan   ‘again’
    sahku   sahkuŋ   ‘one’

(Lombardi 1998, tone not marked)

When McCarthy proposed FINAL-C in 1993, it was considered to be relevant for the domain of the phonological word. That is, no r-intrusion occurs after function words, because, he argues, function words are not parsed as phonological words. We now conclude that FINAL-C should be parameterised for its domain of application.

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32 The authors do not call the constraint in Lardil FINAL-C but FREE-V; as they mention themselves, the connection with FINAL-C is however, quite evident.
3.6.2.6. FINAL-C (or FREE-V) in Lardil

I will not give a detailed explanation of the actual difference between FINAL-C and FREE-V (cf. McCarthy 2002). It is an interesting case of the obligation of words not to end in a vowel and therefore it will be discussed here – although without details. In the discussion of Lardil I will follow the authors and speak of FREE-V. This constraint expresses that the original stem-final vowel is deleted.

(65) FREE-V Word-final vowels must not be parsed (in the nominative)

If a stem-final segment is deleted (or remains unparsed, to keep to the terminology of the article), this has consequences for the way the morphological shape is mirrored in the phonological one. It results in a difference between the final edge of the stem and final edge of the syllable. In (66) the stem includes the final /i/ while the final edge of the syllable is before the /i/ (the final syllable is /yi.l/). The stem-final /i/ is unparsed and therefore phonetically deleted in the end.

(66) Stem: /yiliyili/ Stem ‘oyster’
     Syllable: /yi.li.yi.li/ (phonetically: [yiliyil])

It appears that languages differ with respect to the acceptance of such violations of perfect mirroring. The technical term used for this constraint is ALIGNMENT (ALIGN). It can be formulated as follows.

(67) ALIGN The final edge of the stem corresponds to the final edge of a syllable

As an example I will use an input which is a polysyllabic vowel-final stem, such as /yiliyili/. The input (stem) /yiliyili/ is phonetically realised as [yiliyil]. The high-ranking constraint FREE-V forces the /i/ segment to remain unparsed and eventually to become deleted phonetically. As an illustration, look at the following tableau (from Prince & Smolensky 1991:120, with some adaptations).

(68) (Part of) tableau of the stem /yiliyili/ ‘oyster’

<table>
<thead>
<tr>
<th>/yiliyili/</th>
<th>FREE-V</th>
<th>ALIGN</th>
<th>PARSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>[.yi.li.yi.li]</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
</tbody>
</table>

This tableau demonstrates that it is acceptable to violate the constraints ALIGN and PARSE, if, by doing so, the higher-ranking constraint FREE-V can be satisfied. PARSE is concerned with phonetic realisation. If the segment /i/ remains unparsed (indicated as < i >), it means the segment is not syllabified and as a consequence cannot be

33 The case of Lardil is more complicated than shown here. For an extensive treatment, see McCarthy (2002).
realised phonetically. Because of the fact that the final vowel is not parsed, the constraint ALIGN is violated as well: there is a difference between the final edges of the stem and the syllable. However, in this language it is so important that these stems do not end in their original vowel, that it is possible to delete an entire segment and to consequently create a difference between the morphological and phonological representations, to reach this goal.

The other candidate does not suffer from these shortcomings. In the form [yiliyili] all input elements are parsed and therefore pronounced. Consequently, PARSE is not violated, nor is ALIGN – as the morphological form is completely aligned with the prosodic form. However, in this case, the constraint FREE-V is violated. As the constraint FREE-V is higher ranked in this language than PARSE and ALIGN, it is worse to violate the single constraint FREE-V than to violate the two lower constraints ALIGN and PARSE.

We have seen two illustrations of FINAL-C in two languages, Tunica and Lardil. Lardil is a rather complicated example but impressive in its preference for deletion over having the original vowel word-finally. Tunica is also an illustration of the parameterisation of this constraint for different domains. We have seen that words can be forced to end in an onset (with an empty nucleus) and that this may apply to phonological phrases as well.

3.7. Conclusion

This chapter has been devoted to FINAL-C, a high-ranking constraint responsible for the distribution of vocoid sequences and long lax vowels in Tilburg Dutch. FINAL-C is argued to be a constraint referring to segmental content and to structural relations within the word. It requires the word-final segmental material to be licensed in an onset position. The analysis of French loans in this dialect gave rise to a question regarding the amount of structure we want to represent. The topic of sonority has been discussed because of its relevance for constraints such as FINAL-C, as well as because of its possibly questionable representation in GP.

I have shown that the influence of this constraint is noticeable not only in Tilburg Dutch but also in a number of Dutch dialects and in other languages as well. A lot of attention was paid to these indications of FINAL-C because it appears to be a counter-intuitive constraint: it is the opposite of NOCODA, which demands that syllables be open and to end in a vowel. It might be the case that FINAL-C languages take the word domain for structural wellformedness (Van Oostendorp p.c.). This implies that, even though the structure is far from optimal from a syllabic point of view because it violates NOCODA, it is optimal with respect to word structure because it satisfies FINAL-C. For syllables it appears to be best to have a final, filled nucleus, while for words it seems best to have their final segment occurring in an onset. Consequently, languages which consider the word domain to be the most relevant, preferably have words ending on a consonantal position. According to Van Oostendorp, other languages, such as Italian, look at the syllable domain with respect to structural wellformedness. Since syllables prefer to end in a filled nucleus,
words in such languages are mainly vowel-final. In these languages, the syllable-level wins over the word-domain.

This chapter was meant to make progress towards a better understanding of the demand to have word-final segmental material occurring in an onset. The next chapter will consider the Tilburg Dutch vowel system. We will see what the consequences of the GP view of laxness are for the analysis of the vowel system in this dialect.