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

2.1. Introduction

The main part of this chapter is dedicated to a discussion of Government Phonology topics which are most relevant to this thesis. Optimality Theory (OT) plays a less fundamental role in the present work. It will only play a major role in the chapters on diphthongs and morphophonology. As will become clear below, contrary to GP, OT is not very concerned with representational issues – both theories can therefore be combined without objection. The GP view on segmental representation is discussed in 2.2, with special attention to the representation of laxness. Section 2.3 is concerned with constituent structure. In 2.4 the morphology-phonology interface is discussed, while in 2.5 I consider the possibilities of combining the theories of GP and OT.

Optimality Theory has been developed in the 1990s as a theory that considers Universal Grammar to be a set of constraints on representational well-formedness (Prince & Smolensky 1991). It is neither necessary nor possible for a grammar of a language to satisfy all constraints since constraints are often conflicting. To solve these conflicts, constraints are ranked in a dominance hierarchy: the candidate output-form that satisfies the highest-ranking constraints is the optimal form — the fact that lower-ranked constraints are violated does not matter. Grammars of languages and dialects differ in the ranking of these constraints. An (imaginary) example is the case of two languages, which differ among other things as to whether words have to begin with a consonant or whether such an onset consonant is not obligatory. In this imaginary mini-grammar, two constraints are involved. One is ONSET and the other is FAITH. ONSET penalizes words which do not begin with an (onset) consonant but with a vowel and FAITH penalizes all changes (by way of deletion or epenthesis) of an output form as compared to the input. Thus, the difference between these two languages does not lie in a difference of constraints, but in a difference of ranking. In language X, ONSET is ranked highest in the hierarchy, implying that for this language it is important to have all its words beginning with a consonant, even if this means that an epenthetic consonant is added (or a vowel is deleted). In language Y, the hierarchy is the other way around: in this language it is apparently more important that the output is the same as the input, without any deletion or epenthesis, even if this is at the cost of having a word start with a vowel. The two columns below the input give possible candidate output forms. The relevant constraints are given on the top-row of each column. A * marks a violation of a constraint while an exclamation mark indicates the fatal character of a violation. For instance, even if in the form VC in (1a) FAITH is satisfied, the violation of the highest ranked constraint is fatal. The pointed hand indicates which form is the actual output. In (1a) the mini-grammar of language X is shown: this language does not allow for onset-less words – it would probably insert [?i] or some other (almost) empty epenthetic consonant, represented by a bold-face C.
Language Y does not require its words to begin with a consonant as much as it penalizes any change - be it epenthesis or deletion - to the input.

Whereas OT is pre-eminently a theory dealing with the interaction of constraints without being much concerned with their representation, GP is mainly a theory concerned with representations. In GP, phonological phenomena are generally considered to be consequences of the positions which the segments in question occupy in the phonological structure. Harris (1994) shows for instance that the reason why, in some English dialects, the /t/ is pronounced as a glottal stop ([ʔ]) foot-internally but never foot-initially is the fact that foot-initially the onset position is relatively strong as compared to that of the foot-internal onset. This is why an almost empty segment [ʔ] is found in this weak position, and the segment [t], which is more complex, in the strong position and not vice versa. To make this more concrete, the phonological structure of the words in question accounts for the fact that in many dialects of English pity is pronounced as [piʔi], while tummy is never pronounced as *[ʔ]ummy. After all, in pity the t is foot-internal (it does not occur in the stress-receiving syllable), which means that it occurs in a weak, dependent position. This position is most suitable for segments which do not consist of much material, such as glottal stops. On the other hand, in tummy the t is in the onset of the stressed syllable and therefore foot-initial. The foot-initial position is a position which prefers more or stronger material since, as we will see below, it has to license other positions. A comparatively weak segment, such as the glottal stop, is not able to do this. Consequently, foot-initial consonants are weakened only rarely.

Another illustration of the GP approach is the case of Dutch lenition. In a lexically conditioned process, Dutch /d/ can be pronounced as [j] in certain (weak) positions and in an informal register (cf. 2).

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1 The subject of the internal representation of coronals, including /t/ is a complicated one. Sometimes coronals behave as ‘regular’ consonants while in other cases they behave as almost empty consonants (cf. Chapter 3, section 3.5.2.2)
Word- and foot-initially, that is, in a strong position, this never happens, as is illustrated in (3).

(3) dedo / *jedo / *jejø ‘acts’
    dodo / *jodo / *jojø ‘dead’ (noun or adj.)

As in the case of English [t] and [?, the second consonant in (2) occurs in the relatively weak foot-internal onset position and is therefore inclined to weaken; this is not the case when the consonant is foot-initial (cf. 3).

2.2. An elemental framework

In GP segments are made up of elements. Elements are in some ways like ‘traditional’ features but they are considered to be interpretable independently of other elements. This implies also that the phonological primitives of GP, the elements, are fully interpretable phonetically. For instance, the vowel /i/ is the independent manifestation of the element I. Depending on the vowel system in its totality, an /e/ would be something like (I,A) reflecting the fact that it is an open version of a front vowel. In this sense, GP elements are like chemical elements: H stands for hydrogen, O stands for oxygen and in the combination of H₂O it stands for water; in a similar way I is the representation of /i/, A is the representation of /a/ and together they stand for /e/.

This apt comparison demonstrates that, as complex H₂O cannot exist without its ‘ingredients’, oxygen and hydrogen, so the complex of (I,A) cannot exist without independently occurring I and A. This means that the vowel /e/ cannot occur in a language which does not contain the vowels /i/ and /a/. This is in accordance with the facts. Furthermore, the fact that the vowels /i/, /a/, and /ao/ are the universally unmarked vowels is reflected by the fact that they have the simplest internal structures of all segments: they are made up of one element, I, A, or U, respectively. Their unmarked status is indicated by the lack of complexity of the segment, that is, in the small number of elements the segments contain. This is of course not the case in a system with features. Such a system would reflect no such thing: depending on the language in question, /i/ or /e/ contain more, less or the same amount of features.

---

2 Similar lines of thought can be found in Dependency Phonology (Anderson and Jones 1974, 1977; Anderson and Ewen 1987) and Particle Phonology (Schane 1995).
The phonological processes which GP allows for, are restricted in kind and number. Elements can undergo fusion or fission. For instance, two adjacent elements can become fused in one segment (e.g. /ai/ > /e/) and elements can undergo the opposite, fission (i.e. /e/ becomes /ai/). As a result of this, common processes such as diphthongisation and monophthongization can be analysed in an insightful manner in this theory.

The number of elements is limited; headedness is used (through underlining) to create a larger potential of distinctions among segments. All phonological relations in GP are asymmetrical. In a segment, there is always one head and one or more dependents: for instance, in the example above, the segment /e/ consists of (I,A) - the underlined I is the head of the expression, reflecting the fact that the /e/ is an open version of a front vowel. In the same language, the somewhat more open segment /æ/ would consist of (I,Å); in this case, the A element would be preponderant.

### 2.2.1. Vowels

For the representation of vowels we need the elements I, A, U and @; I standing roughly for frontness, A for lowness, U for roundness, and @ for laxness. These are the ‘ingredients’, which - on their own or in combination - represent all possible vowels. A segment which consists of the single element I, is the primary vowel /i/. A and U on their own stand for the peripheral vowels /a/ and /u/.

The other vowels besides /i/, /a/, and /u/, are combinations or fusions of elements. For instance, /æ/ is (I,A), while /æ/ is (I,Å) (in a language where this vowel phonologically is the lower version of /e/).

The GP representation of laxness (by means of @) is different from that of other features or elements in the sense that elements such as U, A, or I make their contribution to the character of the segment in question whenever the element is present in the representation of a segment. To have this influence on the segment, it is not necessary to be the head of the expression. On its own, @ is the representation of the cross-linguistic prototypical neutral vowel, often schwa-like in character. In combination with other elements, there are two possibilities. @ is assumed to be present as a kind of baseline in every segment but it only contributes to the expression as a whole when it is the head of the expression, and is consequently underlined. Openness, for instance, is represented by the element A - an element which has its influence on the segment in question whether it is head of not. RTR/lax/centrality, on the other hand, is represented by @, which is the head of the expression by definition. This is illustrated in (4).

---

3 Generally (lax) A is considered to be the instantiation of the primitive element A (cf. Kaye et al. 1990). In Dutch, however, there is both tense /a/ as well as lax /a/. Consequently, I will consider tense /a/ to be the instantiation of the A element in this thesis.
(4) shows that the elements I and A make their contribution whether they are heads or not: the difference between /a/ and /æ/ for instance is due to the addition of a non-underlined (so non-head) I. On the other hand, the centrality/lax/RTR element @ is present in every segment but has, except in the representation of /æ/, no contribution to make. After all, it is not a head and its presence as a base line is therefore not felt; this is why it is customary only to mark the presence of @ in a representation when it is the head. When the element for laxness, @, is not the head of a representation but is merely present without exerting any influence, it is generally assumed to occupy a non-occupied tier (in (4) the U tier). In example (5) below, we see another instance of the influence of @ when it is the head: together with a dependent U it represents /o/, and without another element it stands for the neutral, schwa-like segment.

(5)  

<table>
<thead>
<tr>
<th>N</th>
<th>N</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>U</td>
<td>U</td>
<td></td>
</tr>
<tr>
<td>@</td>
<td>@</td>
<td></td>
</tr>
</tbody>
</table>

It is important to realise what the implications are of the way laxness is represented in this framework. The fact that @ only makes a contribution when it is the head implies that lax vowels always have a @ head. A crucial consequence of this special status of @ is the reduced ability to make contrasts among lax vowels. Headedness distinguishes between the tense vowels /æ/ and /e/ in (4) above.

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4 One may wonder on which tier @ would be located if every tier is occupied by I, A, and U.
5 However, see Chapter 4, section 4.3, where I will briefly discuss Cobb (1997), who argues that lax vowels are headless.
Obviously it cannot perform the same function among lax vowels, since with these vowels the role of headedness is taken by @.

The use of elements can be clarifying in the analysis of phenomena such as vowel reduction as well as in the analysis of diphthongisation or monophthongisation. In an elemental framework we do not have to add or delete feature-matrices; it suffices to rearrange the segments which are already there. Harris (1994:99) uses as an example caught, a word which was pronounced with /aw/ in earlier stages of English and with /ç/ in modern English. The fusion or composition of the U and A elements resulted in the long monophthong /ç/, as demonstrated in (6).

\[
\begin{align*}
aw & \rightarrow \varsigma \\
| & | \\
U & U \\
A & \\
\end{align*}
\]

(cf. Harris 1994:116)

The opposite phenomenon, fission or decomposition, can also be illustrated in the English language. In some English dialects spoken in Scotland, Ireland and parts of England the ‘older’ monophthongal forms /e/ and /o/ are retained, whereas these forms have diphthongised into /ei/ and /ou/ in other variants of English, in the southeast of England resulting in /ai/ and /au/, respectively. This decomposition or fission of elements, formerly contained in one segment, can be represented as follows.

\[
\begin{align*}
e: & \rightarrow ai \\
| & | \\
I & U \\
A & A \\
\end{align*}
\]

\[
\begin{align*}
o: & \rightarrow au \\
| & | \\
I & U \\
A & A \\
\end{align*}
\]

(cf. Harris 1994:100)

Another illustration can be found in Dutch. In Dutch dialects we find many monophthongal as well as diphthongal versions of a similar historical form. To give an example, the Standard Dutch word for ‘goat’ is /xèt/, whereas it is /χèt/ in Tilburg Dutch. Without claiming that this is a historical process going from /eɪ/ to /eː/ or vice versa, we can represent the difference between the two segments in a straightforward fashion in element theory.
In this subsection the elements for vowels have been introduced. A special place is taken by @ for laxness: this element functions in a unique manner as compared to the other elements. The unique position of laxness among the vowel elements strongly affects the analysis of the Tilburg vowel system, as we will see in Chapter 4. In the next subsection we look briefly at the representation of consonants in GP.

2.2.2. Consonants

The same elements as we found above for vowel segments, are used to represent place for consonants. The element I inheres in palato-alveolar consonants, U in labial and A in uvular and pharyngeal ones. @ specifies velarity for consonants and R stands for coronality (the independent interpretation is the coronal tap). As far as what is ‘traditionally’ called manner, we distinguish \( \) for stopness and h for noise. h is present in fricatives; in genuine plosives there is also a ‘noisiness’ which characterises the release phase - these then have an h element (contrary to unreleased stops). In (9) we see that in the vowel /s/ the ‘noisiness’ or stridency is indicated by the fact that the element h is the head.

\[
\begin{array}{cc}
(8) & xeit (\text{Standard Dutch}) & yeit (\text{Tilburg Dutch}) & \text{‘goat’} \\
\hline
\text{N} & \text{N} \\
/ \setminus & / \setminus \\
\times & \times \\
\mid & \mid \\
A & A \\
\mid & \mid \\
@ & @ \\
\mid & \mid \\
I & I \\
\end{array}
\]

In (9) we see that in the vowel /s/ the ‘noisiness’ or stridency is indicated by the fact that the element h is the head.

\[
\begin{array}{cc}
(9) & s \setminus f \\
\times & \times \\
\mid & \mid \\
h & h \\
\mid & \mid \\
R & R \\
\end{array}
\]

---

6 Coronal consonants behave in a similar way cross-linguistically. There is some discussion going on within GP about the best way to represent coronal consonants, a.o. in view of the phenomena of the intrusive /r/ in English and the placeless /rl/ in Dutch dialects (Van Oostendorp 2001). For instance, Kaye and Ploch (2001) 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).
As far as voice or laryngeality is concerned, Harris (1994) points out that laryngeal contrasts are usually uniquely treated as contrasts between voiced and voiceless. It seems, however, that the phonetic realisation of laryngeality is by no means constant cross-linguistically. For instance, in English the contrast between what are usually called voiced and voiceless consonants, really is a contrast in voice onset time. That is, there is a contrast between voiceless aspirated or fortis plosives and neutral ones. In French the contrast between, say, the sounds symbolised as /b/ and /p/ or /d/ and /t/ is between fully voiced and voiceless unaspirated. Thus, for a language one needs to determine which segment types have which laryngeal elements. In English the lexical representation of fortis or voiceless aspirated obstruents contain the element H. Obstruents in the neutral series (/b, d, g, z, v/ etc.) lack a laryngeal element. In French, fully voiced obstruents contain the element L, contrasting with neutral obstruents. In Dutch, the contrast seems to be one between voiced and neutral, the voiced segments bearing the element L. Sonorants in general lack an element L: they have spontaneous voicing (which does not usually participate in phonological processes) and contrary to obstruents, they lack active voicing. Examples are given below.

(10)  

<table>
<thead>
<tr>
<th>aspired coronal stop /t/ in English</th>
<th>(neutral) unaspirated/voiced stop /d/ in English</th>
</tr>
</thead>
<tbody>
<tr>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>h</td>
<td>h</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>R</td>
<td>R</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>?</td>
<td>?</td>
</tr>
<tr>
<td></td>
<td>H</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>(neutral) coronal stop /t/ in Dutch</th>
<th>voiced coronal stop /d/ in Dutch</th>
</tr>
</thead>
<tbody>
<tr>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>h</td>
<td>h</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>R</td>
<td>R</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>?</td>
<td>?</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>L</td>
</tr>
</tbody>
</table>

---

7 Some people unify phonation and tonal categories: H is then present in (contrastive) high toned segments, L in low toned ones. As Harris (1994) states, this is controversial but since we are not dealing with a tonal language here, we will leave this matter out of consideration.
One would therefore expect that in English a segment might lose its aspiration in a neutralising context. In Dutch one would expect that in a neutralising context a segment might lose the L element: that is, lose its voice. We will see that this is indeed the case, as can be demonstrated from the well-known process of Final Devoicing in Dutch. By way of illustration the following examples are given, illustrating the lack of aspiration in segments in weak positions in English and the lack of voice in segments occurring in weak positions in Dutch.

\[
\begin{array}{ll}
\text{strong position} & \text{neutralizing, weak position} \\
\hline
\text{English} & \text{English} \\
[t\text{h}] \ (\text{segment contains H}) & [\text{after}] \ (\text{segment lacks H, aspiration}) \\
\text{Dutch} & \text{Dutch} \\
[\text{bad}n] \ 'to take a bath' & [\text{bat}] \ 'take a bath (1 s.)' \\
\text{(segment contains L)} & \text{(segment lacks L, voice)}
\end{array}
\]

This brings us to the effects on consonants when they are in a weak position, e.g. to the consonantal equivalents of the vocalic fission processes that produce phenomena such as vowel reduction: i.e. lenition or weakening. These consonantal reduction phenomena include vocalisation (weakening to a glide or liquid (/d/ > [j])), spirantisation (development of a plosive into a fricative (t > s)), and debuccalisation (loss of supralaryngeal gesture, as in /s/ > [h]). Above we have already seen instances of such processes. For instance, it has been observed that, whereas pity is pronounced with [?] and not with a full [t] this does not happen when the segment is in a strong position (*[?ummi]'tummy'). We have also seen that in Dutch vocalisation of a voiced coronal stop can, in certain weak positions, produce a glide (/ro\text{d}a/ > /ro\text{j}a/). Finally, Final Devoicing in Dutch is a ‘loss’ of the L element in a weak position (/ba\text{d}n/ /ba\text{t}/). This consonantal lenition - melodic decomposition or fission - is a sign of a position’s diminished ability to support melodic content. That is, some positions are typically resistant to lenition, while others are not – in tummy the coronal obstruent is in a foot-initial position and will therefore never be pronounced with a tap or a glottal stop whereas the t in a foot-internal onset may well become [?] or [r].

One of the advantages of a theory such as GP might be that this framework has a sound theory about which phenomena occur in which positions. Phenomena such as vowel reduction, consonant weakening or devoicing, which are seemingly unrelated, can be shown to be a consequence of the same mechanism. An important factor in accounting for these phenomena, is licensing: direct and indirect licensing conditions determine what melodic material different positions can support. The next section will therefore discuss constituent structure and licensing relations in GP.
2.3. Constituent Structure

This section deals with autosegmental and prosodic licensing, Licensing Inheritance, and licensing and governing domains. These are all important notions since phenomena such as consonantal weakening, vowel reduction, syncope, and sonority relations are consequences of phonotactic dependencies between head or licenser and dependent or licensed positions within and between constituents. That is, between and within constituents some positions are stronger than others and stronger positions have to license – to sanction, allow for – the weaker ones. In which position a segment may occur depends on the internal structure of the segment and the strength of the position in which the constituent occurs.

Any syllabic unit within a representation has to be integrated into the phonological hierarchy in order to be phonetically interpretable. This integration is done by licensing, an asymmetric function which binds each unit in some way to another unit (Harris 1997:35). Harris (1997) uses the term A-licensing for autosegmental licensing: the sanctioning of segments by the syllabic positions to which they are attached. P-licensing stands for Prosodic Licensing. All units on a certain level within a prosodic hierarchy need to be P-licensed by another unit, except for the head of the domain. This means that each level of the prosodic or phonological hierarchy constitutes a licensing domain, e.g. a rhymal domain, the licensing domain of the foot, or that of the word. P-licensed units can A-license less material than P-licensing units. For instance, between two nuclei in a word, there is a (P-)licensing relation: the nuclear head of a word P-licenses the other (dependent) nucleus. Therefore the nucleus which is the P-licenser, can have more material (or a non-neutral head) in its segment than the P-licensee. P-licensed positions typically contain less complex material or schwa. This accounts for the fact that in the core, native vocabulary of a language such as Dutch, which is basically a trochaic language, we find many bisyllabic words with some kind of full vowel in the first (stressed) syllable and a schwa in the second syllable. The (P-)licensed - and therefore weak, non-head - position (A-)licenses an almost empty segment such as a schwa. In (12) an example is given of both P-licensing and A-licensing.

---

In (12) ‘kamer’ ‘room’

/‘kamər/ in (12) forms a trochee and consequently, the nuclear position $x_2$ P-licenses the second nuclear position $x_4$. The nuclear position $x_2$ A-licenses the melodic material defining /a/. The nuclear position $x_4$ A-licenses the melodic expression defining /‘kam/ – a weak segment – headless and without any non-neutral material. Because $x_2$ (P-) licenses $x_4$, (a prosodically recessive or weak position) $x_2$ may A-license more segmental material than $x_4$.

The difference in licensing potential depending on the strength of the position is also true of non-nuclear positions. In 2.1 I briefly discussed such a case in Dutch. In a lexically conditioned process, Dutch /d/ can, in certain (weak) positions (and in certain informal registers), be pronounced as [j] – examples of this being [dod]/[doj] whereas [jod]/[joj] (‘dead’) is unacceptable.

Consonantal lenition – melodic decomposition – is evidence of a position’s diminished ability to contain melodic content, that is, the ability to be complex or non-neutral headed is concerned. The foot-initial onset position is a licenser or head position and consequently (P-)licenses the foot-internal onset position. As licenser positions typically (A-)license more segmental material than (A-)licensed positions, lenition (which consists of an increase in sonority and, therefore decrease in complexity) typically occurs in the licensed and not in the licenser position. Up to now not much has been said about the reasons behind this difference in (A)-licensing potential, depending on whether a segment occurs in (P-) licensing or licenser position. For instance, in the example above, it has not yet been explained why an onset in a (P)- licenser position may (A)-license more elements than an onset in a (P-) licensed one.

Harris (1994, 1997) accounts for these differences in licensing ‘power’ with the notion of Licensing Inheritance. Licensing Inheritance states that a licensed position inherits its A-licensing potential from its licenser and that the stock of A-licensing potential is depleted through transmission via an intervening position - it

---

9 Stress is indicated by ‘ in front of or above the syllable in question.
10 @-headed vowels are often called headless because for a segment the effect of being headless of @-headed is the same in most respects.
11 For now I consider lack of complexity to correspond to sonority. In Chapter 3, I will, however, make some critical comments regarding this connection.
loses some of its potential when there are more intermittent steps between the licensor and licensed position. Because of this, some positions - such as the foot-initial onset, which is only one step away, as it were, from its 'ultimate' licenser - are typically resistant to lenition, while others are not. We can illustrate Licensing Inheritance by the following schemata from Harris (1997:354) – at the same time, giving an account of the already observed ['dodə]/['dojə] examples (cf. 2.1).

(13) a. Foot-initial C

\[ \begin{array}{c}
  \text{x}_1 \downarrow \\
  \text{x}_2 \downarrow \\
  \text{x}_3 \downarrow \\
  \text{x}_4 \\
  \hline
  \text{C}
\end{array} \]

(e.g. 'tummy (English), 'doje (Dutch), (instead of *tummy or *joje)

b. Foot-internal C (intervocalic/domain-final)

\[ \begin{array}{c}
  \text{x}_1 \downarrow \\
  \text{x}_2 \downarrow \\
  \text{x}_3 \downarrow \\
  \text{x}_4 \\
  \hline
  \text{C}
\end{array} \]

(e.g. p‘tì (English), doje (Dutch))

In (13a) the segment in x₁ is directly licensed by the following nucleus.\(^\text{12}\) /t/ is, as it were, only one step away from its licenser, the following nucleus in x₂. In (13b), /t/ (x₃) is weakened to a glottal stop because it gets its licensing only indirectly. The first nucleus, x₂, licenses the second nucleus (x₃), which in turn licenses the foot internal onset in x₃. The licensing is, as it were, two steps away and therefore the licensing potential has diminished. The same applies to /dojə/. The first onset is directly licensed by the following nucleus whereas the second onset is more remote from its licenser. In other words, by the time the licensing potential reaches the foot-internal consonant, it has already lost part of its licensing power.

The notions of licensing and government are treated differently in the literature.\(^\text{13}\) I will basically follow Harris (1994) who considers government to be a sub-case of licensing. One of the characteristics of licensing relations is that there generally is some type of distributional asymmetry between the licensor and the licensee. However, in the sub-case of licensing, government, the licensed position is

\(^\text{12}\) Licensing is indicated by arrows.

subject to particular phonotactic restrictions (Harris 1994:168). That is, government is a kind of licensing in which the licensed position generally suffers from severe restrictions with respect to possibility to support segmental complexity. For the present work it is not necessary to strictly distinguish between the notions of government and licensing; since government is a sub-case of licensing, I will refer to licensing instead of to government.

The licensing principles account for the fact that cross-linguistically constituents are maximally binary branching. Licensing is considered to be local and unidirectional. It follows that constituents are maximally binary branching. In (14) some licensing domains are given, the heads of the constituents being represented by a vertical line.

(14) licensing domains

<table>
<thead>
<tr>
<th>Non-branching</th>
<th>Branching</th>
</tr>
</thead>
<tbody>
<tr>
<td>Onsets</td>
<td></td>
</tr>
<tr>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>\</td>
<td>\</td>
</tr>
<tr>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Nuclei</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>\</td>
<td>\</td>
</tr>
<tr>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Rhymes</td>
<td></td>
</tr>
<tr>
<td>R</td>
<td>R</td>
</tr>
<tr>
<td>\</td>
<td>\</td>
</tr>
<tr>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>\</td>
<td>\</td>
</tr>
<tr>
<td>x (x)</td>
<td>x (x)</td>
</tr>
</tbody>
</table>

(Harris 1994:150)

Languages vary with respect to whether they possess branching constituents. Some languages don’t have branching onsets (Arabic), some languages do not possess branching rhymes (e.g. Zulu), while a language such as Yoruba does not have branching nuclei and therefore no vowel-length contrast (Harris 1994:150).

As mentioned, government has a strong connection with phonotactics: that is, the (elemental) content of the non-head, licensed segment is restricted by the content of the head unit or licenser. Branching nuclei and branching onsets differ from branching rhymes in that the first two are (head-initial) governing domains, while a branching rhyme constitutes a licensing domain but not a governing domain – the coda/rhymal adjunct position is (inter-constituent) governed by the following onset. This is why in a language such as English or Dutch the head of the rhyme and the head of the nucleus do not restrict the content of the rhymal adjunct; it only restricts the rhymal adjunct as far as length-phenomena are concerned. To make this more concrete: in Dutch any coda consonant/rhymal adjunct may follow any vowel, as long as - word-internally - the vowel is lax and not tense (for some, short and not long). Such independence does not exist in the governing domains in the next
example: in all three domains (in Dutch) the content of the dependent positions is severely restricted by the head of the domain.

(15) governing domains

<table>
<thead>
<tr>
<th>Branching Onset</th>
<th>Branching Nucleus:</th>
<th>Onset-Rhyme domain</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. O / \ x₁ \ x₂</td>
<td>b. N / \ x₁ \ x₂</td>
<td>c. R O / \ x₁ \ x₂</td>
</tr>
</tbody>
</table>

\[\text{twee 'two' wij wei 'we' ander ander 'other'}\]
\[\text{drie dri 'three' koud kou 'cold' lompen lomp 'rags'}\]
\[\text{denken denkə 'to think'}\]

(Standard Dutch)

The first two representations in (15a) and (15b) - the branching onset and branching nucleus - are instances of constituent government: the head governs (and therefore also licenses) its complement within the constituent. By way of comparison, in (16) an impossible branching onset is presented.

(16) */rd*

\[O \]
\[/ \]
\[x x \]
\[| | \]
\[R R \]
\[\]

An onset such as */rd/ in (16) is not acceptable because the onset is a head-initial governing domain. Therefore a downward complexity slope should exist between the two positions (viewed from left to right). That is, within a governing/phonotactic domain, the melodic expression occupying the governing position must be at least as complex - in the case of onsets, more complex - as the expression occupying the governed one. This implies that the second position in a branching onset may never contain more elements than the head of the onset in the first position. Examples of branching nuclei are long vowels and diphthongs. In both cases the nucleus branches, the difference being that in a long vowel the material of head and
dependent position is completely shared, while in a diphthong there is just very little independent material in the licensed position (usually a high vocoid).

Besides the governing domains of the onset and nucleus there is one other governing domain generally mentioned in the literature. This is the interconstituent governing domain consisting of an onset and a coda (cf. 15c). The coda is a marked, unwished-for position of a kind of hybrid character due to the fact that the coda position is governed outside of its own (rhymal) domain while it is licensed to occur as a position in its own domain. Government by the following onset is interconstituent government, in which the direction of government is from right to left. This accounts for the fact that in many languages the coda consonant must be homorganic with the following onset - the distinctive source of melodic material, which is shared - in the licensing and governing position. Let us consider the following representation in which part of the segmental material is shared between coda and onset.

(17)  Onset-Rhyme domain

\[ R \quad O \]
\[ x_1 \quad x_2 \]

Dutch: \textit{ander} \textit{and\textordmasculine} \textit{ander} ‘other’ \quad \textit{lompen} \textit{lamp\textordmasculine} ‘rags’

English: \textit{winter} \quad \textit{pamper}

In cases such as (17), the segmental content of the coda is determined by the content of the following onset. That is, because the coda is licensed through government by the following onset, it may not contain much material: it may autosegmentally license either the same or part of the same material as its licenser or very little complex material. This is why in codas one often finds only sonorants and/or homorganic consonants.

A result of the obligatory licensing of a coda by a following onset (Coda Licensing) is onset maximisation: *VC,V syllabification follows from the requirement that a coda must be licensed by a following onset. For instance in a word such as English \textit{pity} it is guaranteed by Coda Licensing that the /t/ is syllabified in the onset of the second syllable and not in the coda of the first syllable. If it would be in the coda position, Coda Licensing would be violated as there would be no onset to license the coda. Coda Licensing has far reaching consequences for the analysis of (phonetically) word-final consonants.\footnote{As mentioned, Piggott (1999) has a different view: according to him word-final consonants are in some languages syllabified as onsets and in others as codas. Polgárdi (1998) assumes the mainstream GP principle that word-final onsets by definition have to be followed by empty nuclei to be a violable constraint. See also below in 2.3.2.} It is a – rather controversial –
theory-internal argument for the syllabification of the domain-final consonant as onset rather than coda. The reasoning is that, if we would accept the notion of a word-final coda, Coda Licensing would be violated as there would be no following nucleus to license it. In order to justify in a theory-internal manner that words can never end on a coda, the theory needs this Coda Licensing. In section 2.3.2 I discuss the consequences for the analysis of word-final consonants and present arguments for this apparently unnecessary abstractness. Before doing this, we take a look at another aspect of Coda Licensing: the notion of empty nuclei.

2.3.1. Empty nuclei

Empty nuclei may occur word-internally or word-finally. First of all the topic of word-final empty nuclei is discussed. The subject of word-internal empty nuclei will be treated subsequently.

If Coda Licensing requires a coda consonant to be licensed by a following onset and if Onset Licensing requires an onset to be followed by a nucleus in order to get licensed (all units must be licensed in order to be pronounceable), this implies that an apparently monosyllabic word such as English *pit* must have the following phonological structure.

(18) O N O ← N
    |    |    |
    x x x x
    |    |
    p i t

In this example we see that the word-final consonant is in the onset of the second syllable, followed, licensed and properly governed by an empty nucleus – this is indicated by the arrow.

In GP there are two possibilities as far as word-final positions are concerned. Either a language licenses word-final empty nuclei (these are the languages in which words can phonetically end in a consonant) or a language does not license them (these are the languages in which words always end in a vowel, that is, a phonetically realised nucleus). Languages which sanction domain-final empty nuclei are languages in which words phonetically may end in a consonant and in

---

15 Strictly speaking, in every empty nucleus there is a latent @ present. Only when it is forced to do so, it surfaces – generally having a schwa-like vowel quality. The concept of empty onsets was suggested before that of empty nuclei. One of the first of these analyses was Charette’s analysis of h-aspiré in French (Harris 1994:179). Charette (1991) analyses the difference between *la amie* ‘the girlfriend’ and *la hache* ‘the axe’ - [lami] and [la aʃ] - as a consequence of the fact that in *la hache* the word begins phonetically with a vowel but has a word-initial onset at the skeletal level, dominating a skeletal point which prevents the two nuclear points from being adjacent (Charette 1991:91).
which words end in a schwa or another vowel. In fact, Dutch is such a language: it has words such as /modə/ ‘fashion’ as well as words ending (phonetically) in a consonant (actually, an empty nucleus). Harris (1994:181, 182) suggests that the difference between an empty nucleus and a schwa is based on whether the melodic content is headed or not. That is, an empty position contains latently present melodic material @, together with which it forms a potential autosegmental licensing domain. In (19) below, a possible representation is given.

(19) ‘Empty’ nucleus

\[
\begin{array}{ccc}
\text{N} & \text{N} \\
\text{x} & \text{x} \\
\text{@} & \text{@} \\
\end{array}
\]

(Harris 1994:182)

When the melodic content of an ‘empty’ nucleus is not autosegmentally licensed - not connected to a skeletal position - it has no element as its head.

Harris (1997:328) argues that there are theory-independent arguments for the existence of domain final empty nuclei. For instance, in metrical analyses of some languages it is assumed that null-vowel syllables are metrifiable in the same way as weak-vowel syllables (see for instance Burzio 1994). The fact that null-vowel syllables are assumed to exist in some languages, of course does not mean that we can assume that they exist in all languages. It is however an argument for the possibility of the concept of final empty nuclei. In Spanish, for instance, the final stress pattern of consonant-final words (e.g. papél) reduces to the penultimate pattern typically found in vowel-final words (e.g. patáta), if we assume that both types of form contain a final trochaic foot - pa(pél0) and pa(táta). In English, it is assumed that both prevent and agenda end in a final heavy-light foot, even though the final weak nucleus in prevent is empty (pre(vént0), a(génda)).

A second way in which final empty nuclei betray their presence, is when some constraint forces their phonetic interpretation. For instance, Harris (1994) argues that the apparently epenthetic vowel separating obstruents of the same type in English suffixed forms with –(e)d or -(e)s is the phonetic expression of a domain-final nucleus which otherwise remains silent (cf. also Kaye 1987). Expressions such as to fade and bush have the following lexical representation (with a final empty nucleus, licensing the word-final onset).

(20) a. O N O N

\[
\begin{array}{cccc}
\text{x} & \text{x} & \text{x} & \text{x} \\
\text{f} & \text{e} & \text{d} \\
\end{array}
\]
When the past tense or the plural suffix is added, a structure results in which two alveolar obstruents are next to each other, only separated by a domain-final empty nucleus. 16

(21) a. O       N       O       N       O       N       O       N
    |       |       |       |       |       |       |       |
    x x    x x x ] x x ]
    |       |       |       |       |       |       |       |
    f       e       d       d

(21) b. O       N       O       N       O       N       O       N
    |       |       |       |       |       |       |       |
    x x    x x x ] x x ]
    |       |       |       |       |       |       |       |
    b       u       @       s

In this view the schwa in a past tense form such as *faded* and a plural form such as *bushes* is not an epenthetic vowel, which separates the two alveolar obstruents of the stem and the suffix. It is the domain-final nucleus which does not surface in other contexts because English is a language which licenses domain-final empty nuclei. In this case, the OCP forces the @, which is latently present in every (so-called empty) position, to surface.

Whereas word-final empty nuclei have to be licensed parametrically, word-internally the situation is different. Syncope shows that a vowel can only be suppressed if it’s adjacent to a vowel which itself is not suppressed. That is, empty nuclei are sensitive to a restrictive case of government licensing: Proper Government. Proper Government requires that the licensing nucleus itself must not be empty. There is more than one version of the principle for licensing of word-internal empty nuclei, Proper Government. In this thesis the version of Rowicka (1996, 1999), will be adopted. Since this view came as a reaction to the ‘Standard’ GP view, we will first discuss the standard view briefly.

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16 As we will observe below and in Chapter 5 on Morphophonology, the morphological domains are visible in phonology. Therefore, in (21) - ((fad0)d0) and ((bush0)s0) - we find two domain final empty nuclei: one following the internal lexical domain final consonant and one following the consonant which is in the final position of the total domain, including the suffix.
2.3.1.1. Proper Government

According to the standard view, Proper Government is considered to take place between (nuclear) constituents and therefore is argued to go from right to left. Harris (1994:183ff.) mentions examples from an Amerindian language Tonkawa as well as from English. Proper Government is not obligatory in all languages. Below we will see examples which demonstrate that in English it is not obligatory to leave the nucleus unfilled when it is properly governed by a following filled nucleus. In Tonkawa the situation is different. In Tonkawa the suppression of the vowel in a site that is traditionally called a syncope site, is obligatory. The syncope site is the second nucleus (from the left) in the word: /pic_na-no?/. When a prefix is added and a different segment becomes the second nucleus in the word, this vowel is suppressed, as in /we-p_cena-no?/.

Optional 'syncope' cases in English include words such as separate, definite, factory, misery, family, etc. The following example illustrates this.

(22) a.  def\textsuperscript{nat}

\[
\begin{array}{cccccccc}
O & N & O & N & O & N & O & N \\
| & | & | & | & | & | & | \\
x & x & x & x & x & x & x & x \\
| & | & | & | & | & | & | \\
d & e & f & \circ & n & \circ & t \\
\end{array}
\]

(22) b.  def\textsuperscript{nat}

\[
\begin{array}{cccccccc}
O & N & O & N & O & N & O & N \\
| & | & | & | & | & | & | \\
x & x & x & x & x & x & x & x \\
| & | & | & | & | & | & | \\
d & e & f & n & \circ & t \\
\end{array}
\]

In (22) we see representations of two possible pronunciations of definite: in the a-example all vowels are pronounced, while in the b-example, the second nucleus is silent: [def\textsuperscript{n}at]. English words such as buttoning present another interesting case. This word can - in the appropriate region and context - be pronounced as butt\textsuperscript{ing}, without the intervening schwa-like vowel. The consonants surrounding such a 'syncope' site could appropriately be called a bogus cluster: they do not really form a cluster. They are two consonants separated by a nuclear position, which is optionally filled.

A similar empty position separating two consonants, resulting therefore in a similar kind of bogus cluster, can be argued to be the consonants in a word such as kidney. Words such as those (also atlas, atmosphere, etc.) seem to form counter-evidence for a sonority sequencing generalisation, saying that in optimal coda-onset clusters, the first consonant is at least as sonorous as the second (cf. Venneman 1988). Below, in the section dealing with Final Consonants, it will be argued that
final consonant clusters are often similar to word-internal coda-onset clusters and it will be supposed that not only these word-internal cases are coda-onset clusters but that the final-consonant clusters are coda-onset clusters as well. In the next section on final consonants, I discuss work by Charette (1991) on empty nuclei in French. French has a type of consonant cluster word-finally, which English has word-internally only: consonants forming a branching onset. The French case is interesting because the syllabification of word-internal and word-final consonants becomes clear by the vowel length of the preceding vowels. Apparently, French domain-final nuclei can also license a branching onset, contrary to English or Dutch.

Kaye (1987) demonstrates the presence of empty nuclei in Moroccan Arabic. Charette (1991) does the same for French. I will discuss some of her arguments. According to Charette, a word such as ennemi [enmi] ‘enemy’ has the following structure.

<table>
<thead>
<tr>
<th>O</th>
<th>R</th>
<th>O</th>
<th>R</th>
<th>O</th>
<th>R</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>N</td>
<td>N</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e</td>
<td>n</td>
<td>m</td>
<td>i</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(Charette 1991:78)

She gives the following evidence for the structure with an empty nucleus above. First of all, words such as ennemi or appeler [aple] ‘to call’, can be pronounced with a schwa ([ennemi], [apəle]) in careful speech, whereas this is never possible with words such as place ‘place’ ([plas], [*polas]). The same is true for pairs such as plage - pelouse (*pelage - *plouse). The distinction lies in their lexical representation: words which can be realised with a schwa have an empty nucleus in their representation; words which are never pronounced with a schwa, do not have an empty nucleus. There is no question of an epenthetic vowel; it is rather the case that some words have an empty nucleus, which may or may not be realised (as schwa) under certain conditions.

Secondly, Charette argues that the imperative form may constitute a clue for the presence of an empty position, even when there is no phonetic evidence in the form itself. In the infinitive [aple], appeler, there is no evidence of the presence of a nucleus between the [p] and the [l]. However, when we consider the imperative form, we see a vowel [e] in the position where an empty nucleus is positioned ([apel!] ‘call’). In other forms, such as for instance parler ‘to speak’, no such alternation is found. The infinitive and the imperative forms are [parle] and [parl], respectively. This is to be expected if the lexical representation of words such as appeler contains an empty nucleus (between the [p] and the [l]), contrary to words such as parler in which there is no empty nucleus (between the [r] and [l]).

Thirdly, Charette (1991) points at words which have different phonetics, though apparently they all contain the same morpheme. The following words all
contain the base *venir*. Depending on the dialect, the words in (24a) are pronounced without a schwa, while the examples in (24b) all phonetically contain a schwa.

(24) a. 

| souvenir  | suvnir | 'to remember' |
| devenir   | dvnir  | 'to become'   |

b. 

| parvenir  | parv«nir | 'to achieve' |
| subvenir  | sybvnir  | 'to provide' |

The first group in (24a) is phonetically bisyllabic, while the second group in (24b) is phonetically trisyllabic. It seems natural to assume that the base *venir* has the same representation in all cases, in spite of the variation in pronunciation. Therefore Charette assumes that in all these cases there is a nucleus present which receives no phonetic interpretation after a single consonant and which becomes manifest after a consonantal cluster. I will not go into the details of her argumentation. It will suffice to say that in both cases the nucleus is empty. In the [parv«nir] cases the empty nucleus is followed by a proper governor (the following nucleus); in spite of this it is phonetically realised since it has to help, at it were, the preceding onset /v/ to govern the coda /r/. In the [suvnir]-cases the empty nucleus can remain empty: it is properly governed by the following nucleus and, since it has no consonant cluster preceding it, there is no objection to it being phonetically unrealised.

Having demonstrated what empty nuclei are in standard GP and in which ways they can be licensed (domain finally, through parameterisation; domain-internally, by Proper Government), I will now propose an alternative analysis of Proper Government for word-internal empty nuclei, based on work by Rowicka (1996,1999).

### 2.3.1.2. Head-initial or Trochaic Proper Government

According to Rowicka, Proper Government is always left-headed. As the Dutch stress system is trochaic, I will follow her in this for Dutch.\(^\text{17}\) In this view the surfacing of empty nuclei is analogous to the assignment of stress: a syllable gets stressed if it is the head of a metrical foot; otherwise it is unstressed. Similarly, an empty nucleus must surface if it is the head in a Proper Government relation.

What is attractive about this view, is that Proper Government now forms an integral part of other inter-nuclear relations, such as stress, vowel harmony and vowel reduction. It is plausible that if a language is head-initial as far as stress is concerned – that is, trochaic – it is head-initial in the other aspects as well. If the behaviour of empty nuclei is on a par with the above-mentioned inter-nuclear relations, we do not expect proper-government to be head-final, while stress is head-
initial. In Chapter 5, the chapter on Morphophonology, we will see examples and a more elaborate account of Trochaic Proper Government.

The subject of word-final consonants is closely connected to the subject of empty nuclei, as word-final consonants are supposed to be licensed by empty nuclei in GP. Therefore, word-final consonants will be discussed in the next subsection.

2.3.2. Word-final consonants

In this section I will present arguments of why we assume word-final consonants not to be in the coda position but in the onset position of an empty syllable. Recall, first of all, that traditionally the word-internal coda and word-final consonant were considered to be ‘the same’ structurally; they were both assumed to be codas. One of the more controversial aspects of GP probably is the claim that word-final consonants are not in the coda position but in the onset of an empty syllable. This claim is not only controversial but also has far-reaching consequences which I have already indicated in Chapter 1, announcing my claim that in Tilburg Dutch (and Standard Dutch) word-final consonants after short, lax vowels are structurally ambi syllabic, geminate consonants followed by an empty nucleus. Such a strong claim asks for motivation. Before doing so, two alternative views will be briefly discussed.

Polgárdi (1998) assumes the need of an onset to be licensed by an empty nucleus to be a violable constraint. In this view, phonetically word-final consonants are considered to be onsets which are, depending on the situation, followed or not followed by an empty nucleus. Piggott (1999) allows for both syllabifications: as codas and as onsets, depending on the language in question. For instance, in languages in which no restrictions apply to word-final consonants in contrast to word-internal coda consonants, word-final consonants are assumed to be onsets. There are also languages, according to Piggott, in which word-final consonants are syllabified as codas. In these languages, word-final consonants are subject to the same restrictions as word-internal codas. As Dutch seems to belong to those languages in which there are fewer restrictions on word-final consonants than on word-internal codas, I will assume that in Piggott’s view, Dutch is a language in which the final consonant is syllabified as an onset. It would take too long to discuss the languages for which Piggott assumes final codas. I will not discuss Piggott any further here, nor will I follow Polgárdi; at least in the case of Dutch, I will show that it pays to keep to the most restrictive version of the theory. This is the GP version, in which all phonetically word-final consonants are syllabified as onsets, which are in turn licensed by empty nuclei.

Let us look at the motivation for the assumption that word-final consonants should not be analysed as codas. There are several respects in which word-final consonants and word-final consonant clusters differ significantly from internal codas (Harris 1994:70 ff.). First of all, there is an argument from syllable-typology, which indicates that final consonants are not the same as internal coda consonants. Harris (1997), referring to Kaye (1990), argues that, whether or not a language possesses internal codas is independent from whether or not it sanctions domain-final
consonants. If a word-final consonant and an internal coda share the same syllabic affiliation, one would expect that any language possessing one, would automatically possess the other. This is not correct: Telugu is an example of a language which has word-internal codas but which does not allow word-final consonants. Luo, on the other hand, is cited as a language which has no word-internal codas but which does allow for word-final consonants.

Secondly, a single word-final consonant in languages such as English and Dutch tolerates a short-long contrast in a preceding nucleus, whereas, as we have seen, in these languages there are severe restrictions on the occurrence of VVC-rhymes word internally. That is, there are no restrictions regarding the identity of word-final consonants, whereas there are - in the case of heavy rhymes - heavy restrictions word-internally: only a very limited number of consonants can follow both short and long vowels word-internally. Such distinct behaviour of word-final and word-internal ‘codas’ is not to be expected if they are the same structurally. In English, for instance, only some fricatives, liquids and homorganic nasals may occur word internally after a VV branching nucleus, (easter, pastry, boisterous, shoulder, launder, council), whereas there is no restriction whatsoever as to the kind of consonant which follows word finally after a VV branching nucleus (slide, soap, steep, etc.). The same is true for Dutch. Trommelen & Zonneveld (1989:132 ff.) state that probably 99.9% of the Dutch rhymes are binary, consisting of only two segments. The fact that there are no restrictions on word-final consonants, also becomes clear when we look at the phenomenon of closed-syllable shortening. Interestingly, as far as word-stress is concerned, we find the same pattern: a word-final consonant typically or consistently fails to contribute to the quantity of the preceding rhyme, to which it supposedly belongs (Harris 1997, Hayes 1982).

One of the responses to this non-coda-like behaviour of the word-final consonant has been the use of notions such as extrasyllabicity, extraprosodity, or degenerate syllables. In an OT framework extraprosodicity has no independent formal status but is an effect deriving from the interaction between two types of constraints (Harris 1997, Prince & Smolensky 1991), one of which calls for the right edge of a syllable to be aligned with the right side of a word and which can be violated because of some higher ranked constraint which causes the end of a final syllable to be moved away from the end of the word. However, according to Harris (op. cit.), the assumption that a final consonant is outside the syllable or the word, does not lead one to expect phonotactic restrictions that hold over these adjacent consonants. This is contrary to the facts: for instance, final -CC clusters in English show interdependencies; this is accounted for if these represent coda-onset clusters (or, for a language such as French: branching onset clusters). Moreover, these interdependencies among final -CC clusters closely resemble those in medial ‘true’ coda-onset clusters.

This brings us to the point where we need to find out what these final consonants are if they are not coda consonants. It has been mentioned that final -CC clusters are similar to coda-onset clusters in English: That is, whereas in English word-final consonant clusters the sonority slope is often not as one would expect for codas, the sonority profile is often quite similar to internal coda-onset clusters. Examples from English are given in (25).
Charette (1991: 123 ff.) gives some arguments both for the analysis of word-final C’s as onsets as well as for the presence of a final empty nucleus in Quebec French. She gives examples of words showing that, whereas a long vowel may occur before a word-internal single consonant or an obstruent-liquid cluster, a branching nucleus is never found before the sequence liquid-obstruent.

(26) a. Long vowel/branching nucleus before a single word internal consonant:

<table>
<thead>
<tr>
<th>Word</th>
<th>Syllable</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>rêver</td>
<td>rêve / ra've</td>
<td>‘to dream’</td>
</tr>
<tr>
<td>pâlir</td>
<td>pâlir / pa'li'r</td>
<td>‘to become pale’</td>
</tr>
</tbody>
</table>

(26) b. Long vowel/branching nucleus before an obstruent-liquid cluster:

<table>
<thead>
<tr>
<th>Word</th>
<th>Syllable</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>sabler</td>
<td>sable /sa'ble</td>
<td>‘to sand’</td>
</tr>
<tr>
<td>prêtrise</td>
<td>prêtriz / pra'triz</td>
<td>‘priesthood’</td>
</tr>
</tbody>
</table>

(26) c. No long vowels/branching nuclei before a liquid-obstruent cluster:

<table>
<thead>
<tr>
<th>Word</th>
<th>Syllable</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>porter</td>
<td>porte / pørte</td>
<td>‘to bring’</td>
</tr>
<tr>
<td>merci</td>
<td>merzi / mɛrsi</td>
<td>‘thank you’</td>
</tr>
</tbody>
</table>

These examples show that a nucleus can branch in French - that is the vowel can be long (or constitute a diphthong) – only when it occurs within a non-branching rhyme. A word such as sabler is syllabified as /sa.ble/; the rhyme is not branching and therefore the nucleus can branch. However, in a word such as porter the syllabification is /pør.te/; the rhyme branches and a branching nucleus cannot occur. Interestingly, Charette shows that long vowels have the same distribution in word-final position. While a vowel may be long or diphthongised before a single word-
final consonant or an obstruent-liquid cluster, a vowel may not branch before a liquid-obstruent cluster, as illustrated in (27).

(27) a. Long vowel/branching nucleus before a single word final consonant:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>bête</td>
<td>litre</td>
</tr>
<tr>
<td>tasse</td>
<td>tasse</td>
</tr>
</tbody>
</table>

(27) b. Long vowel/branching nucleus before a word final obstruent-liquid cluster:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>sable</td>
<td>sable</td>
</tr>
<tr>
<td>pauvre</td>
<td>pauvre</td>
</tr>
</tbody>
</table>

(27) c. But:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>forte</td>
<td>forte</td>
</tr>
<tr>
<td>parc</td>
<td>parc</td>
</tr>
</tbody>
</table>

This indicates that word-final consonant clusters are syllabified in the same way as word-internal consonant clusters. She assumes that single word-final consonants are syllabified in the same way as single word-internal consonants: in both cases not within a branching rhyme but in the onset of the following syllable. The structure she proposes for a word such as fête ‘birthday’ is as follows.

(28) O R O R
    | | |
    | N N
    / \ |
    x x x x x
    | | |
    f a i t

We have seen some empirical and theory-internal arguments for treating final -CC clusters as having the same constituent structure as word internal coda-onset (-C.C-) clusters (or, in a language such as French, as coda-onsents or branching onsets). The clusters of English guilty and guilt can thus both be assumed to consist of a coda-onset combination, as is shown in (29).

(29) a. R
    |
    O N |
    | |
    | x x x x x |
    | |
    g i l t i
In the same way a word, such as English *sit* would have the following representation.

The representation of *sit*, in which the phonetically final consonant is in the onset of the second syllable, is structurally similar to that of a word such as *city*.

In a (non-productive) verbal pair such as *keep - kept* the /p/ can follow a long vowel, because, as we have demonstrated above, it is in the onset and not in the coda. In *kept* however, the onset is occupied by the /t/ and the /p/ is ‘forced’ into the preceding rhyme - making it impossible for a long vowel to precede it (since the rhyme is already occupied and in English super-heavy rhymes are clearly marked).
This last example brings us to another important subject in GP. Contrary to ‘traditional’ views, pairs such as English keep - kept etc. are principally not seen as being cases of resyllabification. Government Phonologists generally do not see these alternations as productive processes any longer: according to them, for instance, both keep as well as kept are listed in the lexicon. This is important, because in GP there is a strong ban on resyllabification. The Projection Principle forces licensing relations to remain constant during a derivation. This implies that syllable structure cannot change. This is no problem in the case of English. The regular, productive verbal system clearly does not evidence shortening (leap - leaped, etc.) and it seems uncontroversial to assume that in cases such as keep - kept no resyllabification takes place. However, in Chapter 6 on Morphophonology I will discuss the productive Tilburg verbal system in which shortening is commonly found and which may be described as a productive version of the (unproductive) English keep-kept kind. How to analyse this is not immediately clear and an entire chapter is dedicated to this issue.

2.4. Morphology-phonology interface

GP distinguishes between analytic word structure and synthetic or non-analytic word structure. An analytic structure is analysable in more than one phonological domain whereas synthetic or non-analytic word structure consists of just one phonological domain. The above-mentioned English leap – leaped is an example of analytic morphology. The form leaped ([liːpʊd]) thus consists of two phonological domains: one consisting only of [liːp0], and the other consisting of the entire word: [liːp0d0]. Both phonological word domains end in a parametrically licensed empty nucleus: [liːp0d0]. Productive morphology typically creates analytic word structure. On the other hand, irregular morphology usually creates non-analytic, synthetic phonological word structure. Of such morphology, creating a word structure without internal word-domains, we have just seen an example: keep – kept. The past tense of keep [kept] is exactly like any other simple monomorphemic English word (e.g. apt): there is only one word domain, with one word-final empty nucleus: [kept0].

In Chapter 6 more discussion of the way in which morphology is represented in phonology will follow. I will now discuss the way GP and OT can be combined.
2.5. Government Phonology and Optimality Theory

GP constitutes the foundation of this work but without the GP theory of parameters. As an illustration of the relative ease with which one can replace parameters by constraints, I refer to Polgárdi (1998) and Rowicka (1999) who discuss the case of a dialect of French and a dialect of the Chadic language of Tangale. These examples concern a conflict between GP principles which can be resolved in GP by, for instance, principle ranking or different parameter settings etc. As discussed in 2.3.1, in the section on empty nuclei, Charette (1991:104 ff.) mentions that in French a potentially properly-governed, empty nucleus, remains empty. One such position is the schwa position in devenir ‘to become’, a word therefore generally pronounced as [dəvnir]. However, such a position is not properly governed and therefore not empty if it has to government-license a consonant cluster ([parvənir] ‘to achieve’). In parvenir the schwa is followed by a full vowel, just as in devenir, and therefore we expect that it is not pronounced. However, if it would remain empty it would not be able to perform its function of licensing the preceding cluster [parvənir]. Apparently, it is more important in French that the consonant cluster remains unchanged than that governed nuclei should be empty.

Charette mentions the case of the Billiri dialect of the Chadic language of Tangale as an illustration of the opposite case. In this language, the principle requiring proper government of an empty position is the dominant one – it is more important for a potentially silent vowel to be silent than for this vowel to government-license the head of a preceding consonant cluster. The properly-governed empty position therefore remains without content; instead, part of the consonant-cluster is deleted (/landa+zi/ ‘your (fem.) dress’ -> *[land-zi], [lan-zi])). In other words, in Tangale a potentially empty position remains silent and instead, the consonant cluster is reduced. When reduction has taken place, there is no consonant cluster to license anymore and therefore the position can remain empty. If the two principles of Government Licensing and Proper Government are in conflict, languages have a choice in which principle they violate and which one they satisfy.

Polgárdi (1998) and Rowicka (1999) assume these phonological principles to be (OT) violable constraints. In Charette’s terminology priority is given to Government Licensing over Proper Government in a language such as French, whereas in Biliri the opposite solution is chosen. Thus, in OT terminology the priority of one principle over another would be expressed in French by the constraint ranking of Government Licensing over Proper Government. This would be quite the opposite to that found in Biliri. Polgárdi (1998) ‘translates’ all kinds of GP principles into violable OT constraints. I will not follow her in this respect but will generally use the ‘traditional’ GP terminology instead of using OT terms. The question as to whether all principles/constraints are violable remains a valid one, irrespective of whether one works within GP or OT. I will not discuss this issue any further.
2.6. Conclusion

The aim of this chapter was to explain the main aspects of Government Phonology which are relevant for this thesis and to discuss some interesting theoretical topics more thoroughly. It has been observed that GP considers phonological phenomena such as lenition and vowel reduction, to be consequences of the positions they occupy in phonological structure. In this sense GP is pre-eminently a theory on representations. OT is used in this thesis as well, not only because some important concepts are phrased in OT terminology but also because OT seems more suitable to deal with variations between languages than OT.

Phonological elements have been discussed in 2.2, both for consonants as well as for vowels. Some special attention has been paid to the vowel element for laxness, @. Its special character has been demonstrated: @ is always present in every vowel segment, although its influence is only felt when it is the head of the complex.

The integration of segments in a representation is done through licensing. This is discussed in 2.3. Licensing is always asymmetrical: there is a head and a dependent. Strong positions can (autosegmentally) license or allow for more material than weak positions. Government is a sub-form of licensing: within a governing domain the content of the dependent position is strongly restricted by the head of the domain. One governing domain is the coda-onset domain: a coda always needs to be licensed by a following onset. However, we have also seen that onsets need to be licensed by nuclei. Taken together, these principles are responsible for the GP view that phonetically word-final consonants structurally are in an onset followed by an empty nucleus. This empty nucleus is licensed parametrically. Two kinds of empty nuclei occur: word-final empty nuclei and word-internal empty nuclei. For the licensing of word-internal empty nuclei the view of Rowicka (1996, 1999) is followed: word-internal empty nuclei are assumed to be licensed trochaically by their domain-heads.

Furthermore, in 2.4, a distinction is made between analytic and non-analytic/synthetic word-structure: analytic structure gives rise to a layered word structure. In synthetic word-structure, no morphology is visible in the phonology. Finally, the possibility of a combination of GP and OT is discussed in 2.5.

In the next chapter we will discuss an aspect of the phonological word in Tilburg Dutch: the requirement for words to end in an onset and the consequence of this requirement for the segmental structure of words.