1 Theoretical framework

1.1. Introduction

The analysis presented in this book will be based upon the theoretical framework of Government Phonology (Kaye, Lowenstamm and Vergnaud (KLV) 1985, 1990; Kaye 1990; Charette 1991; Gussmann and Kaye 1993; Harris 1994). Within this theory of representations (henceforth referred to as GP), phonological phenomena are regarded as reflecting a limited number of universal principles and language-specific parameters. The model of GP, whose *spiritus movens* is the notion of government, demonstrates that governing relations are present in phonology. Government is understood as an asymmetric relation existing between two skeletal positions, i.e. units of phonological timing. As regards the melody units, each segment is viewed as composed of one or more phonological elements, each of which can be phonetically interpreted in isolation (Harris and Lindsey 1995). Finally, the theory is extremely strict in selecting the phenomena which should be subject to phonological analysis. In particular, all truly phonological processes must be caused by the contexts in which they take place. If there is no context for change, such a change cannot be perceived as phonologically motivated.

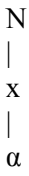
1.2. Model variations

The first and the most fundamental version of the theory (KLV 1990; Kaye 1990; Charette 1991) recognized as many as three syllabic constituents – Onset (O), Nucleus (N) and Rhyme (R) – and imposed a binary limit on the number of skeletal positions within each constituent. More recent analyses (Lowenstamm 1996; Scheer 1996; Rowicka 1999; Szigetvári 2000; Cyran 2003) have formally refined the model by reducing the number of constituents to two – Onset (O) and Nucleus (N) – or even dispensing with this division in favour of postulating universal Consonant-Vowel sequences. Hence, the version of GP which does not recognize three maximally binary constituents can be referred to as the CV-model or simply CV. Since the following analysis will utilize the CV-model of GP, this chapter will only concern itself with the issues relevant to the present study.

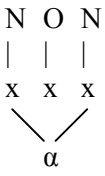
1.3. Formal structures of segments

The model employed here recognizes only sequences of single onsets and nuclei. Thus, all segments are attached to either one or two skeletal positions. In formal terms, we can distinguish the following structures of long and short segments:

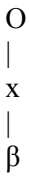
(1) a. ***short vowel***



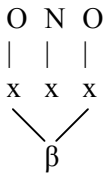
b. ***long vowel***



c. ***short consonant***



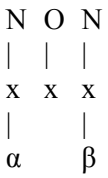
d. ***long consonant***



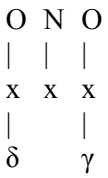
Short vowels (1a) and single consonants (1c) are associated with one skeletal slot, these positions being dominated by (N) or (O), respectively. Long vowels (1b) are linked to two consecutive nuclei, whereas long consonants, i.e. geminates (1d), are attached to two successive onsets.

As far as diphthongs are concerned, these are sequences of two short vowels, each attached to one nuclear point, while consonant clusters are linked to two consecutive onsets. This is shown below:

(2) a. ***diphthong***

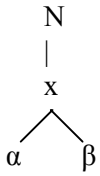


b. ***consonant cluster***

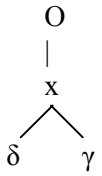


Finally, let us remark on the structure of short diphthongs and affricates, which are structurally monopositional despite containing two melodies. Formally, the structures of both short diphthongs and affricates are represented as follows:

(3) a. ***short diphthong***



b. ***affricate***

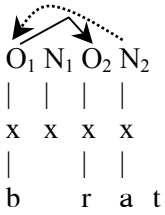


1.4. Government and licensing

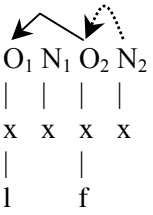
As mentioned above, government is perceived as an asymmetric relation existing between two skeletal slots. This concept is central to GP in both its radical and modified versions. Taking into account that there are no binary constituents, each relation obtains between slots belonging to separate constituents. Moreover, according to the Licensing Principle (Kaye 1990), each position in a word and each relationship must be licensed. What is of utmost importance is that GP recognizes empty categories. Given that every word ends with a nucleus, a word like [bet] *bet* must be analyzed as one with a word-final empty nucleus which licenses the preceding onset. In some languages, e.g. Italian or Japanese, empty nuclei cannot function as onset licensers and every word in these tongues must end in a vowel. Universally, vowels are better licensers for the preceding onsets than empty nuclei.

Consonant clusters are perceived as sequences of onsets which may enter into interonset governing relations. Every IO relation must be government-licensed by the nucleus which immediately follows it. In languages such as Polish, empty nuclei can government-license only certain types of consonant clusters, while full vowels are capable of licensing a wider range of sequences. Generally, the licensing properties of nuclei are language specific.[1] Using three Polish words, [brat] *brat* – 'brother', [elf] *elf* – 'elf' and [len] *len* – 'linen' (whose gen.sg. is [lnu] *lnu*), we can represent all the possible governing relations as folows:

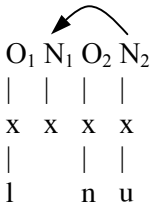
(4) a.



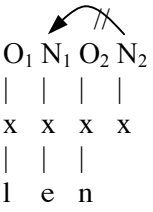
b.



c.



d.



Interonset (IO) ← Proper Government (PG) ← Government-licensing ⇠

[1] See Cyran (2003) for an analysis of language-specific licensing properties of nuclei..

In (4a) and (4b) we can see two interonset governing relations, rightward and leftward, respectively (see section (1.6.) for the reasons why some segments are governors while other must be governees). The word [brat] *brat* – 'brother' in (4a) exemplifies a governing relation between the onset (O_1) – the governor, and the governee (O_2). This relation is licensed by the nucleus (N_2), which dominates the vowel [a]. It is worth noting that the intervening nuclear position (N_1) is an empty slot and plays no part in phonology. The word [elf] *elf* – 'elf' in (4b) illustrates a reverse situation, where the governor (O_2) follows the governee (O_1). This relation is also licensed by (N_2) which is empty but plays a role in phonology by virtue of being a licenser for the whole interonset relation. The intervening nuclear position (N_1) is empty and irrelevant to the structure. Szigetvári (2000) calls such nuclei 'buried', whereas in Cyran (2003) they are referred to as 'locked'. In (4c) we can see Proper Government obtaining between the nucleus (N_2), which includes the vowel [u], and the empty slot (N_1). Given that the word [lnu] *lnu* – 'linen'-gen.sg. alternates with [len] *len* – 'linen'-nom.sg., it is assumed that the underlyingly empty nuclear slot (N_1) can remain inaudible if it is properly governed by the following realized vowel (Kaye 1990). This condition is met in [lnu] but not in [len] in (4d), where the final nucleus is empty and cannot properly govern. As a result, the empty position (N_1) has to surface phonetically in the form [len].

I should be us noted that the licensing of every onset by the following nucleus is taken for granted and is not represented graphically unless this concept is relevant to a given problem. The only situation when the licensing of an onset by the immediately following nucleus does not take place is in interonset governing domains, as shown in (4a) and (4b). In these structures, the nucleus (N_2) government licenses the whole relation, whereas the nucleus (N_1) plays no active role in the structure to which it belongs in only a formal fashion. Certain inactive nuclei will be shown to have influence on some phonological processes, though.

We should also observe that in the [len]/[lnu] alternation the structures of both the alternants are identical, i.e. ONON. This is ensured by the Projection Principle (KLV 1990:221), which states that there is no resyllabification and that, even if a position is phonetically empty, it is still part of the phonological representation.

1.5. Element Theory

In GP each segment is said to contain one or more phonological elements. These elements, also referred to as 'primes', represent the smallest units of representation and can be realized in isolation. For example, the element (A), when interpreted alone, roughly corresponds to the cardinal vowel [a], while (A) combined

with (U) represents the vowel [o]. Any combinations of elements are language-specific, and so are the phonetic interpretations of element structures. The number of elements originally proposed in KLV (1985) has been undergoing the process of reduction and nowadays between six and eight primes are employed in phonological analyses. In the present study the following primes for vowels will be used:

(3)	***elements***	A	I	U	***combinations***	A, I	A, U
	vowels	[a]	[i]	[u]		[e]	[o]

The elements from which vowels are composed are also employed in consonants, although there they determine only the place of articulation. Other primes contribute different properties to the consonants. The elements used in this work to represent Old Irish consonants are listed below:

(4)	U – labial	A-I – dental	@ – velar[2]	A – alveolar
	ʔ – occlusion	N – nasal	H – stiff vocal cords (voiceless)	

For instance, the Old Irish [p] will be represented by (U, ʔ, H), which means that this is a labial (U) stop (ʔ), which is also voiceless (H). The voiced counterpart [b] will lack the prime (H) and will have the element structure of (U, ʔ).

Similarly to government, which is an asymmetric relation holding between skeletal slots, the status the elements enjoy within a given segment may also differ. In particular, some elements are viewed as headed, which means that they are more important for a given segment than the other primes or that they denote tenseness in vowels. For instance, the English lax [ʊ] is normally perceived as headless (U), while the tense [uː] as headed (U). If more than one prime constitutes a segment, the asymmetry of headedness may denote differences in the phonetic quality, e.g. (A, I) = [e], while (A, I) = [ɛ] or [æ], depending on the vocalic inventory of a given system.

As already mentioned, the employment of both single primes and the combinations of elements varies depending on the phonological system. Therefore, the prime (A) may be realized as [æ] in English but as [a] in Polish. Combinations of primes may bring different results as well, e.g. in standard GP analyses Polish

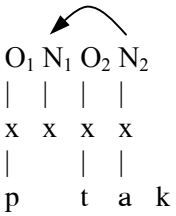
[2] This element is employed here in order to specify the velar place of articulation. It is frequent in other GP analyses, however, to perceive velars as empty-headed, i.e. the velar place of articulation has no vocalic element and 'nothing' heads a velar segment. So as to avoid 'nothingness' as a phonological object, the prime (@) is used below.

[p] equals (U, ʔ, h), while in English it is (U, ʔ, h, H).[3] Finally, in many systems combinations of certain elements are disallowed. For example, the elements (I) and (U) do not combine in Polish or English, but they do in German and Finnish, e.g. (I, U) = [ʉ] or [ʏ]. Formally, the ability/inability of elements to combine is usually determined by melodic constraints.

1.6. Substantive complexity and the governing properties of segments

Another important issue to be mentioned here is substantive complexity and its impact on the governing properties of segments. While discussing the examples in (2a, b) we noted that obstruents, e.g. [b] and [f], are governors, whereas sonorants, e.g. [r] and [l], are governees in interonset relations. This assumption results from the view that governors must not be less complex than the governees. Following the majority of GP analyses, we assume that the obstruents normally contain more elements than sonorants, e.g. [b] = (U, ʔ, h, L) vs. [r] = (A) in the word [brat] *brat* – 'brother'. Sometimes the potential governors and governees are of equal complexity, e.g. [f] = (U, h) vs. [l] = (A, ʔ) in [elf] *elf* – 'elf'.[4] Otherwise, governing relations are ruled out in principle. A good case in point seems to be the Polish word [ptak] *ptak* – 'bird'. Since both [p] and [t] are of equal element complexity, that is [p] = (U, ʔ, h) whereas [t] = (A, ʔ, h), we can assume that no government relation is present between these two segments and the intervening nucleus is licensed by Proper Government. This is shown below.

(5)



In (5) there is no interonset relation between (O_1) and (O_2) since the substantive complexity of these segments disallows such an interpretation. The intervening empty nucleus (N_1) is licensed to remain inaudible by the vowel under (N_2).

In (2a, b) we adopted the notion that governors and governees must contract a governing relation if they are adjacent. In many cases, however, substantive complexity is insufficient. Certain consonant clusters are absent from phonological systems because the following nuclei are unable to act as government-licen-

[3] The element (h) denoting noise will be absent from the analysis of Old Irish consonants for reasons specified in Chapter Two.
[4] In Polish (L) represents voicedness.

sers. Thus, for example, a word-final homorganic cluster such as [rt] is licit in Dutch because the word-final empty nucleus is able to government-license such a relation. On the other hand, a heterorganic cluster such as [rk] is disallowed in Dutch because the domain-final empty nucleus is too weak to grant licensing to this sequence. As a result, epenthesis occurs and the cluster surfaces as [rək]. However, if a full vowel follows either [rt] or [rk], both these sequences are allowed because a vowel is a stronger licenser than an empty nucleus.[5] In the present analysis we will also demonstrate that both substantive complexity of consonants and the governing properties of nuclei play important roles in phonological structure.

1.7. Phonological processes in GP

There are two types of processes recognized by GP: composition and decomposition. In other words, the elements can be either added to or subtracted from a phonological expression in clearly determined contexts. For example, the Primitive Irish vowel [i] was lowered to [e] before a non-high vowel in the following syllable.[6] This lowering of [i] to [e] can be accounted for as composition, i.e. (I) → (A, I). In the same prehistoric period the vowel [o] was raised to [u] before a high vowel in the following syllable. This change can be perceived as decomposition, i.e. (A, U) → (U).

It should be emphasized that phonological processes must occur in particular contexts. If there is no context which triggers a process, such a phenomenon cannot be viewed as purely phonological. Therefore, the word-final devoicing of obstruents in Polish, e.g. [b] → [p], which is exemplified by a pair of words such as [xlebа] *chleba* vs. [xlep] *chleb* – gen.sg./'bread', can explained in terms of phonology because the Polish word-final empty nuclei are too weak to support the element (L) which stands for voicedness in Polish obstruents. As a result of diminished licensing power of the final empty nucleus, we see the decomposition of (U, ʔ, h, L) into (U, ʔ, h) in [xlep] but not in [xlebа]. On the other hand, the word-initial lenition of obstruents in Modern Irish, e.g. [b^{i}an] *bean* vs. [ən v^{i}an] *an bhean* – 'woman'/'the woman', although it involves the decomposition of (U, ʔ) into (U), cannot be viewed as a phonologically-triggered process. This is because consonant lenition should take place between vowels, whereas here we observe the weakening of [b] to [v] between a nasal and a vowel. In fact, this lenition was phonologically motivated in prehistory. In Proto-Celtic, a period which prefaced Old Irish by a few centuries, the phrase *sindaː **b**ena was at

[5] For a discussion about different properties of full vowels, schwas and empty nuclei see Cyran (2003:107ff.).
[6] See Chapter Four for details.

some stage reinterpreted as *sinda: **v**ena, which shows that lenition took place in an intervocalic context. Changes of this type will be discussed at length in Chapter Two.

The Irish example shown above can be said to illustrate a morphophonological process.[7] In this work, following Dressler (1977) and Árnason (1985), among others, we will assume that the term 'morphophonology' refers to a situation where past phonological regularities are petrified and when the phonological system develops in a way which makes these regularities synchronically unlikely. For instance, the original phonologically motivated intervocalic lenition of [b] to [v] in *sinda: **b**ena → *sinda: **v**ena, remains up to the present day in the Irish phrase [ən v^{i}an], although the intervocalic context has been absent for many centuries.

[7] The concept of mor(pho)phonology is broadly discussed by e.g. Trubetzkoy (1931), Maiden (1991), and many others.