ON THE ROLE OF EMPTY ONSETS IN TURKISH:
A GOVERNMENT PHONOLOGY APPROACH

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On the Role of Empty Onsets in Turkish

A Government Phonology Approach

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Thesis Abstract

Derya Nuhbalaoğlu, "On the Role of Empty Onsets in Turkish:

A Government Phonology Approach"

This study investigates the distribution of empty onsets [Ox-O] in careful and casual speech of Turkish in the framework of (Standard) Government Phonology (GP). It is proposed that the occurrence of a certain type of an empty onset determined by the speech rate/style allows for a number of optional phonological processes such as liaison, vowel coalescence (within and across domains), vowel assimilation and glide insertion to take place in Turkish.

The present thesis also critically evaluates the previous analyses proposed to identify the nature of the "Soft G" in Turkish. The environments where the "Soft G" is observed in the orthography are considered to signify, often but not always, empty onset(s) in the structure of GP. It is claimed that there is no one-to-one correspondence relation between an empty onset O(x) and <ğ> and that " Soft G" is not a reliable cue in determining phonological objects.

Finally, this thesis examines the structure of *dağ type* and *ayak type* words. The type of an empty onset in these forms is determined and their behavior in vowel initial suffixation is reanalyzed. Given that GP allows only for a minimal interaction between phonology and morphology and referring to the core principles of the theory such as Principle of Non-Arbitrariness, it is argued that *dağ type* behavior and k~ø alternation should not be treated within the domain of phonology, counter to previous analyses.

Tez Özeti

Derya Nuhbalaoğlu, "Türkçede Boş Hece Açışlarının Rolü Üzerine: Yönetimsel Sesbilim İncelemesi."

Bu çalışma, Türkçenin günlük/hızlı ve anlatım konuşmasında hece açışlarının boş olduğu durumların dağılımını (Standart) Yönetimsel Sesbilim (YS) modeli çerçevesinde incelemektedir. Konuşmanın türüne/hızına bağlı olarak belirli türdeki boş hece açışının hece yapılarında yer alması Türkçede ulama, ünlü kaynaşması, ünlü benzeşmesi ve kayıcı (yarı-ünlü) yerleştirilmesi gibi bir takım seçmeli ses olaylarının meydana gelmesini belirlediği ileri sürülmüştür.

Bu çalışma aynı zamanda Türkçede "Yumuşak G" nin yapısını belirlemek için ortaya konan daha önceki çalışmaları eleştirel olarak değerlendirmiştir. "Yumuşak G" nin yazımda yer aldığı bazı çevrelerin, YS'nin yapısında boş hece açışının göstergesi olduğu gözlemlenmiştir. Boş hece açışları O(x) ile <ğ> arasında bire bir, bir tekabül etme ilişkisinin bulunmadığı ve "Yumuşak G" nin sesbilimsel nesneleri belirlemede güvenilir bir araç olmadığı öne sürülmüştür.

Son olarak, bu tezde *dağ* ve *ayak* biçimli sözcüklerin yapısı incelenmiştir. Bu sözcüklerin yapılarında yer alan boş hece açışlarının türü belirlenmiş ve ünlü ile başlayan ek aldıklarında nasıl davrandıkları yeniden gözden geçirilmiştir. Bu çalışma, YS'nin sesbilim ve biçimbilim arasındaki asgari etkileşimini ve bu modelin temel prensiplerini göz önünde bulundurarak *dağ* türü değişimin ve k-düşmesinin, önceki çalışmaların aksine, sesbilimsel çerçevede değerlendirilemeyeceğini ortaya koymuştur.

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CHAPTER 1

INTRODUCTION

1.1 Aim of the Thesis

The aim of this thesis is to explore the distribution of empty onsets in Turkish and to determine what kind of role this distribution plays in a number of phonological phenomena such as liaison, vowel coalescence, dağ type behavior, vowel assimilation, glide insertion and k~ø alternation. The analysis is couched in the framework of (Standard) Government Phonology[1] (henceforth GP), which is a strictly constrained phonological framework building on universal principles and parameters in explaining phonological phenomena.

The following research questions formed the basis of the present study:

(i) What is the nature and identity of the so called 'Soft G' in Turkish?

(ii) What do the environments where we find <ğ> in the orthography structurally correspond to? Is there a one-to-one correspondence relation between <ğ> and some phonological object/constituent? If yes, what are the representational properties of this object/constituent?

[1] As it is presented in (KLV 1990; Kaye 1990, 1995; Charette 1990, 1991; Harris 1990; Yoshida 1991; Charette and Göksel 1994,1996; Cobb 1997 among others).

(iii) What kind of role does the distribution of empty onsets play in a number of phonological phenomena such as vowel coalescence, liaison and vowel assimilation, which take place in casual speech?

(iv) What is the structure of dağ type words? And what are the implications of such structure on dağ type behavior?

(v) Given that GP allows only for a minimal interplay between morphology and phonology, should dağ type behavior and k~ø alternation be expressed in the realm of phonology?

1.2 Outline of the Thesis

In Chapter 2, we will give a brief overview of Government Phonology. We will present the fundamental principles and some core notions of the theory such as constituent structure, licensing and government, the segmental representation, phonological processes, identity avoidance and phonology-morphology interaction in GP.

In Chapter 3, the distribution of 'Soft G' <ğ> and the phonological objects it signifies (/ɣ/, /g/) will be given, as it is presented in previous accounts (Lees 1961, Selen 1979, Konrot 1981, Coşkun 2008, Kopkallı et.al. 2008). We will provide a critical survey of these accounts and indicate the problems their premises generate. Furthermore, looking through the eyes of GP we will identify the structural correlates of the environments where " Soft G" <ğ> is observed, which often but not always correspond to empty onsets with/without a point. We will determine the distribution of empty onsets in Turkish as following: (i) domain initially in vowel initial words

e.g., *ev* 'house' (ii) domain medially in doğa-dua type words, in dağ type words and in ayak type words. (Following Charette (2008) we assume that all domains in Turkish end in an empty nucleus licensed through trochaic government, hence any non-initial empty onset occurring in the structure should considered to be medial).

Domain initial onsets and the phonological phenomena (liaison and vowel coalescence) they are relevant for will be presented in detail while the other three environments will be mentioned only briefly, as they are the subject of discussion in the following chapters.

In Chapter 4, first we will introduce dağ type words and *dağ type* behavior. Second, the literature on *dağ type* words and their behavior in vowel initial suffixation will be presented and will be critically evaluated. Third, the GP representation of dağ type words will be discussed and compared to the other types of length -*merak type* and *bina type*- in Turkish. Finally, we will reconsider *dağ type* behavior referring to the core principles of GP (Principle of Non-Arbitrariness and Minimalist Hypothesis) and exploiting the phonology-morphology interaction the theory allows. We will propose that *dağ type* behavior should not be treated within the domain of phonology, counter to previous analyses (Lees 1961, Clements and Keyser 1983, Sezer 1986, Denwood 2002).

In Chapter 5, we will discuss *doğa-dua type* words. These forms are significant in that they include an empty onset with a point in their representation which either loses its point or gets interpreted in casual speech, giving rise to the (optional) vowel assimilation and glide insertion processes. We will propose that these two processes can be accounted for via element spreading (element A, U and I spreading) which is assumed to take place in casual speech phonology. We will also

discuss the optional variants of *doğa-dua* type words in casual speech and we will attempt to give reasons for such optionality. We will claim that casual/quick speech phonology deviates from regular phonology in a number of ways. We will show that in casual speech element A, which was claimed to be inactive in terms of spreading in the previous accounts (Charette and Göksel 1994, 1996), can spread across an empty onset without a point to the lexically empty positions. We will further propose that A spreading, which can take place both leftwards and rightwards unlike element I and U, does not respect domain boundaries.

In Chapter 6, first *ayak type* words will be introduced in their connection to k~ø alternation. Second, the literature review on k~ø alternation will be presented and discussed. Third, the representation of *ayak type* words in vowel initial suffixation will be analyzed in comparison with the previous accounts given in GP. (Denwood 2002, Balcı 2006). Finally, given that GP allows only for two types of processes (fusion and fission of the phonological primes) we will argue that k~ø alternation should not be treated as a phonological process. Furthermore, we will propose that forms like *ayağı [ajaɯ]* 'foot 3 SG.POSS' contain one single domain while still being regular. They should be considered as involving non-analytic morphology.

In Chapter 7, we will summarize the conclusions of the analyses proposed in Chapter 3, 4, 5 and 6. We will also list a number of questions/points initiated by this study but left for further research. Finally we will present the concluding remarks of the present thesis.

CHAPTER 2

GOVERNMENT PHONOLOGY

AN OVERVIEW

2.1 Introduction

Government Phonology is a generative phonological framework which is based on quite a small number of universal principles and language specific parameters in explaining phonological phenomena.[2] The theory of GP first appeared as a research program founded by Kaye, Lowenstamm and Vergnaud (1985, 1989[3], 1990), henceforth KLV, and aimed at forming a Universal Theory of Phonology, which diverges from the classical (SPE-type) theories in abandoning the rule component. It is in parallel to syntax in allowing multi-level structures and hierarchical organization of the constituents (KLV 1990).

Being one of the most restrictive contemporary phonological theories, GP completely dispenses with arbitrariness in phonological processes. In other words,

[2] GP first appeared on the phonological stage in the mid 80's. During its course of evolution it has been inspired by the Government and Binding Theory of Syntax (Chomsky 1981/93) as well as the rich background of non-linear phonological theories of the time, namely Autosegmental Theory (Goldsmith 1976), CV-tier Theory (McCarthy 1979, Clements and Keyser 1983), Dependency Phonology (Anderson and Jones 1972,1974).

[3] A German version of (KLV 1990).

this framework makes it a necessary condition that there always be a causal relationship between the context and the process taking place in it (Yoshida 1996:1).

Three fundamental principles -which lie at the very core of GP- are of crucial importance for any one adhering to this particular framework. These are the following:

(1) Phonological Epistemological Principle: "The only source of phonological knowledge is phonological behavior " (Kaye 2005).

According to this principle phonetics does not have any significant effect in determining the role of phonological objects in any phonological phenomena. In particular, it is only their phonological behavior , distribution and alternation, which plays a role in differentiating between two phonological objects. Their articulatory properties are of no importance. [4] For instance, Kaye (1981), relying both on synchronic and diachronic data, shows that implosives [gb] in Kru languages behave in exactly similar way as liquids [l] while the two groups are quite different phonetically[5]. Thus, the latter difference seems to be irrelevant in determining the phonological representation of these objects.

(2) Principle of Non-Arbitrariness: "There is a direct relation between a phonological process and the context in which it occurs" (KLV 1990:194).

[4] See also Kaye (1981, 1989, 1995, 2005), Harris and Lindsey (1995) among others for further discussion.

[5] Liquids: a class of consonants including /l/ and /r/ and their variants that share vowel-like acoustic properties and may function as syllabic nuclei. Implosives: sounds produced with an ingressive airstream mechanism that involves a movement of glottis. (Fromkin, Rodman and Hyams 2002:584-586). See also (Ashby and Maidment 2005), (Ladefoged and Maddieson 1996) for further phonetic details.

A classical example given to illustrate this point is a process which converts a high tone into a raising tone following a low tone.

(3)

a.

b. H→LH/L_ *H→HL/L_ *H→LH/_L

. (KLV 1990: 195)

In (3a) skeletal points are lexically associated with the low and high tones respectively via association lines. Low tone spreads into the high tone. Hence we get a rising tone. As can be seen from the diagrams there is a direct relation between the context and the process. On the other hand, in (3b) arbitrary rules are stated, there is nothing in this linear representation which can tell us that one rule is a well-formed and the other is illicit. In other words, the empirical content of GP is higher than that of SPE-type phonologies which allow for a rule component.

(4) The Minimalist Hypothesis: "Processes apply whenever the conditions that trigger them are satisfied" (Kaye 1995:291).

This hypothesis ensures that once the conditions are met for a certain phonological process there is nothing to prevent it from occurring. For instance, if a language X possesses a velar ~ ø alternation in the intervocalic position, we expect all velars to undergo such an alternation, whenever they occur between vowels. According to this hypothesis there is no place for exceptions in phonology.

The principles presented above still remain at the very heart of the theory, however it has been more than three decades since the first emergence of GP and, as is expected from a dynamic theory, it already has a number of variants: Strict CV (Lowenstamm 1996, Szigetvári 1999, Scheer 2004, Bercés 2008), VC-Phonology (Dienes and Szigetvári 1999), Head Driven Phonology (Hulst and Ritter 1999), an X-bar theory of GP (Rennison and Neubarth 2003), The Minimalist Phonology/Big Tree Phonology (Kaye and Pöchtrager 2009). The off-springs of GP differ in many aspects such as the representation of structure and the number and compositional properties of melodic components etc. A detailed exposition of these versions is beyond the scope of this thesis.

The version of the theory we shall apply in this thesis is the Standard GP as it is presented in (KLV 1990; Kaye 1990, 1995; Charette 1990, 1991; Harris 1990; Yoshida 1991; Charette and Göksel 1994, 1996; Cobb 1997 among others), the core concepts of which will be given in the following subsections. The other details of the framework will be presented in the course of the study whenever it is relevant to the discussion. When necessary we will also make use of some new adaptations (principles) to the theory still keeping the Standard GP as a general theoretical frame.

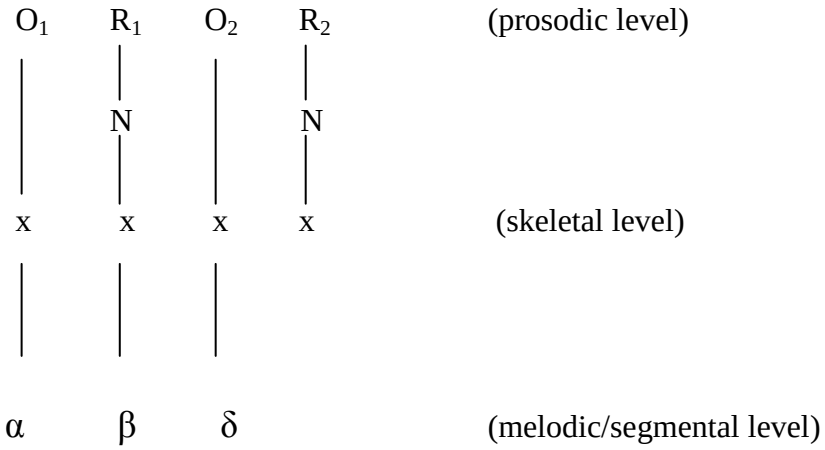
2.1 The Architecture: Structure in GP

2.2.1 Levels of Representation

Representations in GP have a non-linear multi-level shape, with the skeleton constituting a buffer between these levels. We can find three basic levels in GP: a

melodic/segmental level, a skeletal level and a prosodic level. See the representation in (5) below:

(5)



The diagram schematized in (5) above is a typical structural representation of phonological objects in GP. The melodic level of representation hosts melodic primes (elements) –represented by α, β and δ – which will be presented in detail in section 2.4 of this chapter. The skeletal level of the representation (the skeleton), consists of a sequence of "x slots" referred to as skeletal points.[6] The governing relations between these points contracted due to the "substantial conditions" of the melodic primes define the prosodic constituents of a phonological string (Kaye 2002:5).

In the prosodic level of representation, as can be seen in (5)—there are prosodic constituents, typically a series of Onset-Rhyme pairs. Though it is represented in quite a very simplistic manner here, we have to note that this level can

[6] X-slots are characteristic of X-theories (GP, Dependency Phonology), other non-linear theories (CV-type) diverge in the type of representational units of this level (cf. Brockhaus 1995a, for further discussion).

also be projected to upper layers (nuclear projection, licenser projection and further metrical projections) depending on the type of the phonological phenomena one is dealing with.[7] For instance, it is assumed that vowel harmony takes place at the nuclear projection.

Now, after having shown how a phonological string is typically represented in GP, we shall look closely to the different parts of the representation, starting from the top and gradually going down. Before that we will present the notions of licensing and its special type –government–which constitute the driving force in all phonological structures.

2.2.2 Sine Qua Non of GP: Licensing and Government[8]

GP is based on the licensing mechanism between the constituents of the phonological structure. However, licensing has been often used interchangeably with government in GP literature, hence giving rise to the confusion of these two fundamental concepts. Below, we will try to make clear what the two notions refer to and we will indicate the main difference between them.

Licensing, as defined by (Harris 1997:335) " is an asymmetric function which enables an integration of any unit of a representation into the phonological hierarchy by binding each unit in one way or another to some other unit". That is to say, licensing is a kind of existential source for all the members of phonological structure.

[7]The level of licenser projection was first introduced by Charette (1990).

[8] See Scheer (2004: 149-160) for a detailed discussion of the issue and the author's new definitions of the terms in the CVCV framework.

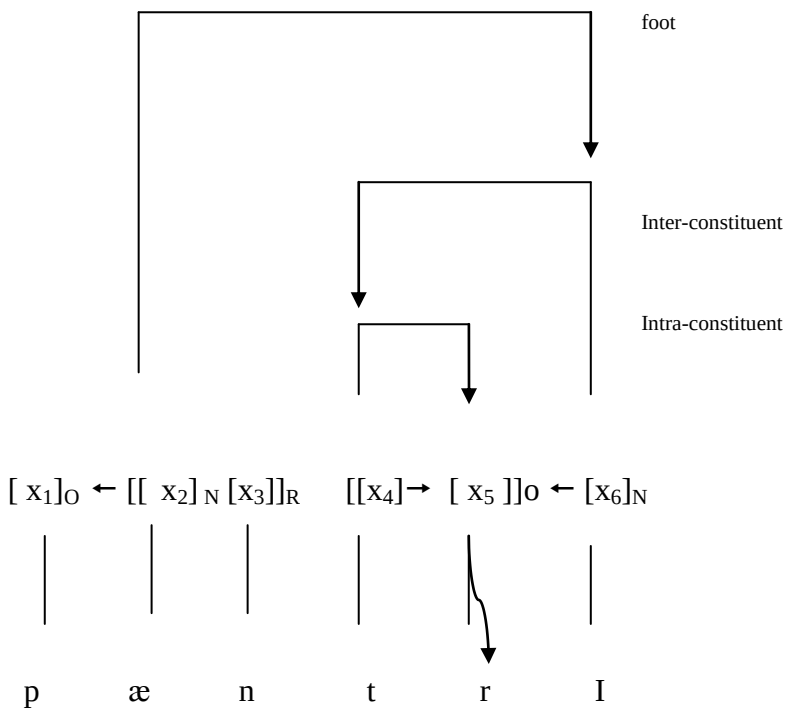
Each position has to be licensed in order to remain in the structure, which is dictated by the Licensing Principle.

(6) Licensing Principle[9]

"All phonological positions save one must be licensed within a domain. The unlicensed position is the head of this domain" (Kaye 1990:306).

The unlicensed position mentioned in the principle above is the nucleus and it is subject to licensing as well in the higher levels of representation. The licensing of the domain head is reflected in its prominence in pronunciation, in other words in its being stressed. Consider the structure of the initially stressed English word pantry in (7) below:

(7)



(Harris 1997:339)

[9] This principle is reformulated as a Phonological Licensing Principle and discussed in detail in Harris (1997).

In (7) above N_2 is the metrical head (unlicensed) position of the structure. The arrows ("→" and "←") indicate the licensing relations contracted between and within the constituents. Every nuclear head uses the licensing potential it inherits from the immediately preceding nucleus to license its melody and the immediately preceding onset and also transfers the remaining licensing power to the following nucleus. For instance, in the structure above N_2 (x6) inherits the licensing potential from N_1(x2) which it uses to license its melody (I) and the immediately preceding branching onset (O_2) whose head (x4) in turn licenses its complement (x5)[10].

The licensing relation holding between an onset and the nucleus immediately following it, is referred to as Onset Licensing and requires that all onsets have to be given license by the following nuclei, either full or empty. That is, every nucleus has to enter the structure with the immediately preceding onset[11] as is dictated by the Onset Licensing Principle:

(8) Onset licensing[12]

"An onset head position must be licensed by a nuclear position" (Harris 1992:380).

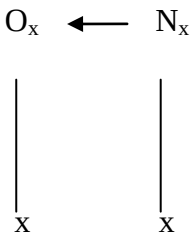
Consider also the structure below which is a typical onset-nucleus pair of the GP:

[10] See Chapter 4, (137-138) for a detailed discussion on licensing inheritance.

[11] We will refer to the nucleus and onset of ON pair, as an onset peer of the nucleus or as a nucleus peer of the onset of that particular pair.

[12] Onset Licensing has been considered as a type of government relation for a long time (especially in 90's) however, as there is no restriction on the type of licensor and licensee in this relationship—as we will see in sec.2.2.2.1 of this chapter—that is every onset irrespective of its type and the melody it dominates has to be given license to 'exist' in the structure by its nuclear peer, we take this relation as licensing relation (see also Kim 1996:21).

(9) Onset- Nucleus peer formed through Onset Licensing Principle



It has been noted by Kim (1996:21) that nuclei which have to license their peer onset can never lack their skeletal points while (simplex) onsets which do not have to undergo such a role can lose their skeletal points.

Government, being a binary and asymmetric relation holding between two members of the skeletal tier, is a special type of licensing.[13] For a government relation to take place two types of conditions–formal and substantive– must be satisfied. Formal conditions include strict locality and directionality, while substantive conditions are about melodic material that positions can host on the basis of their governing status (as a governor/head or governee/complement) (KLV 1990:199).

[13] P-licensing, licensing to govern are some of the other types of licensing.

(10)

a) Strict Locality/Adjacency : "No position must intervene between governor and governee."

b) Strict Directionality: "Directionality of government at the skeletal level is universal". (Constituent Government: left to right ; Interconstituent Government: right to left)

(KLV 1990:199)

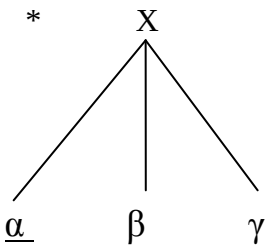
It directly falls out from these two conditions that constituents must be maximally binary, as stated below:

(11) Binarity Theorem

"All syllabic constituents are maximally binary" (Kaye 1990:306).

According to this theorem constituents containing more than two nodes are ill-formed, therefore should be ruled out. This is exemplified in the structure below:

(12)



If we assume that constituent X has three branching nodes, we would face a violation of at least one of the principles stated above. In particular, if α is the head (that is what we expect in constituent government) it would violate strict locality as γ is not immediately adjacent to it as a complement.

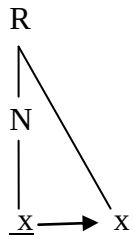
2.2.2.1 Constituent Government:

The Three Cornerstones [O]nset, [N]ucleus, [R]hyme[14]

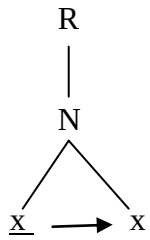
There are three prosodic constituents in GP: O[nset], N[ucleus] and R[hyme]. These constituents may or may not branch, a property determined by language specific parameters. If they branch, then a government relation between the two nodes will hold, as given above. That is, the government relation is strictly local and its directionality is from left to right. All of these constituents except the onset must dominate at least one skeletal point in their representations. This, follows from the licensing role of the nucleus and the fact that every nucleus is dominated by rhyme (see also KLV 1990: Brockhaus 1995a for further discussion).

(13) Contexts for Constituent Government

a. Branching Constituents[15]



Branching rhyme



Branching Nucleus

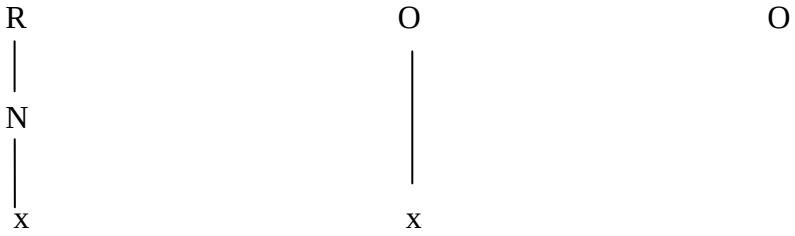
Branching Onset

[14] It has to be noted that GP completely dispenses with the notion of syllable, instead there are only sequences of Onset-Rhyme pairings. For arguments against the syllable see KLV (1990), Harris (1994) among others.

[15] Note that given the conditions on strict directionality and strict adjacency (10) ternary branching structures are automatically ruled out, e.g., a branching rhyme which has a branching nucleus in its representation.

In the branching rhyme the nucleus occupies the left branch of the rhyme, hence being the head of this constituent. Typically the right branch of the rhyme is occupied by the element which is interpreted as a consonantal sound but there are also cases where the melody attached to the nuclear head is shared with the left branch of the rhyme (see for Johnsen's vowel, Kaye 1992).

b. Non-Branching Constituents



simplex nucleus simplex onsets

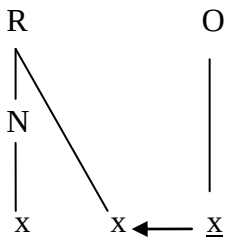
The singleton structures above are as well-formed as the branching ones in (13a). Among the three constituents given above the occurrence of the rightmost one (an empty onset without a point) in the structure, is subject to various conditions depending on the language, and will be explored in detail in the following sections.

2.2.2.1 Inter-constituent Government

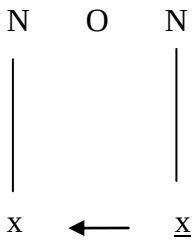
Governing relations hold between two contiguous positions on the skeletal level of representation (KLV 1990:210). The main differences between constituent and inter-constituent government relation are: i) constituent government forms a constituent while the inter constituent government does not ii) the direction of the government relation: The latter is right-headed whilst the former is left-headed. The configurations below show inter-constituent governing relations.

(14) Contexts for Inter-constituent government

(a)



(b)



In the structures above, (14a) is a governing domain formed by a right-headed government relation between the onset head and the right branch of the rhyme. This relation is established as all post-rhymal complements have to be licensed by an immediately following onset. Such a requirement is dictated by the Coda Licensing Principle.

(15) Coda Licensing Principle

"Post-nuclear rhymal positions must be licensed by a following onset" (Kaye 1990: 311).

The implication of the Coda Licensing Principle is that the theory completely dispenses with the notion of coda in the traditional sense.[16]

The reason why Coda Licensing is considered to be a government relation is that the head (Onset) and the complement /post-rhymal complement of this domain are subject to formal and substantive restrictions required for government – mentioned above–. In particular, the governor must be no less complex than the governee and the direction of the government must take place from right to left.[17]In (14b) there is a government relation established between two nuclear positions where an empty onset without a point intervenes.

A typical structural representation in GP and its components (constituents) have already been shown above in (5-14). We have also mentioned that all positions have to be licensed to be integrated into the structure, and that the constituent and inter-constituent relations are contracted through a special sub-type of licensing, namely government.

In what follows we will present yet another type of licensing, p-licensing, which is responsible for the occurrence and distribution of the empty categories in the phonological structure.

2.2 P(rosodic) Licensing of Empty Categories

GP differs dramatically from other phonological frameworks in that it allows for empty positions to occur in the structure, the phonetic interpretation of which is

[16] Note that the term coda is only preserved for practical/communicative reasons.

[17] The conditions on the complexity will be given in 2.5 section of this chapter.

dictated by the Empty Category Principle (henceforth, ECP) (Kaye 1990; Kaye 1995) stated below.

(16) The Phonological ECP[18]

A p-licensed (empty) category receives no phonetic interpretation

P-licensing: 1. domain-final empty categories are p-licensed (parametrized)

2. properly governed empty nuclei are p-licensed

3. a nucleus within an inter-onset domain is p-licensed

Proper Government (p-government):

α properly governs β if:

1. α and β are adjacent on the relevant projection,

2.α is not itself licensed, and

3. no governing domain separates α from β

(Kaye 1995:295)

According to the ECP, a lexically empty position has to be p-licensed in order not to receive phonetic interpretation. However domain final and domain internal empty nuclei differ in terms of licensing conditions they require to remain in the structure, as already stated in the list above. The licensing of domain final empty nuclei is determined by language specific parameter. That is, in the languages where this parameter is ON the words can end in an empty nucleus. In other words languages

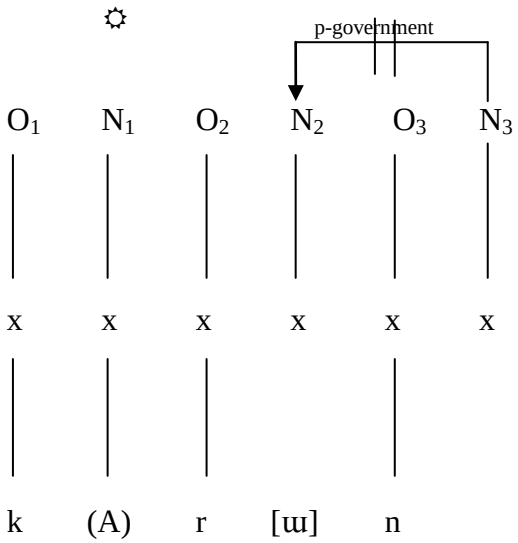
[18] The introduction of ECP brought a structure- conservative explanation for phonological phenomena such as epenthesis.

such as English, Polish and French allow the words to end either in consonants or vowels. On the other hand, the languages such as Italian, Desano and Vata set the parameter to be OFF, therefore in these languages words always end in realized nuclei.

Domain internal empty nuclei are assumed to be silenced either by p-government or through an inter-onset governing domain[19]. Proper government is a licensing relation holding between two nuclear positions which are adjacent on a relevant projection. The governor itself must be a realized nucleus and there should not be any type of governing relation intervening the government site. Consider the vowel-zero alternation process in Turkish, depicted in (17a-b) below.

(17) *karın* *[karɯn]* 'stomach'

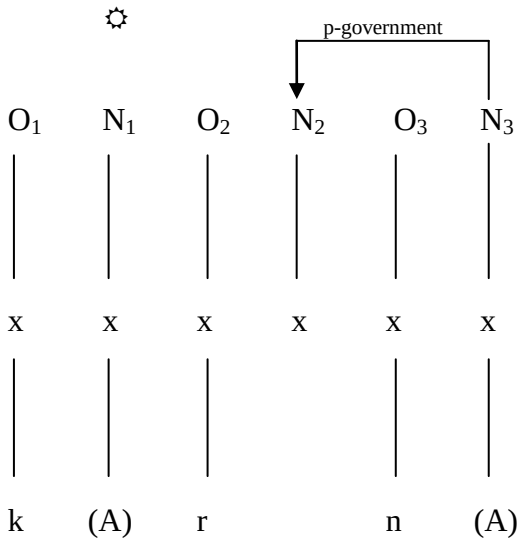
a.



[19] Also see for the Magic Licensing of an empty nucleus in sC- clusters Kaye (1992)

When we trace the p-licensing status of the nuclei from right to left in (17a) we observe the following: N_3 being domain final nucleus is parametrically p-licensed hence remains silent. Being a licensed nucleus itself, N_3 cannot serve as a proper governor for N_2, hence that nucleus is realized. What about the p-licensing status of N_1 then? It seems that N_2, being an unlicensed nucleus itself, is a potential p-governor for N_1. However we have to note that initial nuclei, which are usually the harmonic heads, in Turkish have a special status in that they are lexically specified for their melody and are immune to any kind of changes (linking, delinking, p-licensing) in the course of phonological derivation. Accordingly N_1, cannot be p-licensed through p-government by N_2 in (17a).

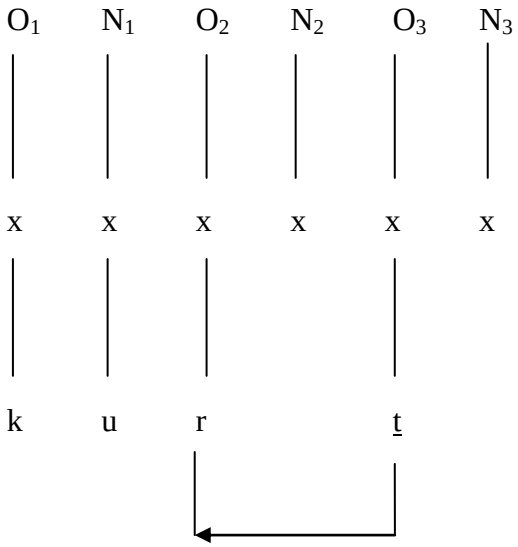
b. *karnı* *[karna]* ‘ stomach- DAT.’



In the dative form of *karın*, N_3 is an unlicensed nucleus, therefore a legitimate p-governor for N_2. N_2 being p-licensed through proper government receives no phonetic content as can be seen in the form above (17b).[20]

Another way to p-license domain internal empty nuclei is through an inter-onset (onset-to-onset) government relation, first proposed in Kaye (1990:322) for Moroccan Arabic stems. It is assumed that the government relation between two onsets, the direction of which is parametrically determined, serves as a means to p-license domain internal empty nuclei. Below in (18) we show an instance of such licensing giving an example from Turkish.

(18) *kurt* *[kurt]* 'wolf'



(İskender 2008:126)

[20]For the practical reasons, we have used Turkish orthography to indicate consonantal segments in the structures above. ☼ signifies the special status of N_1.

In (18) above there is a right headed governing relation between O_3 and O_2 that is in a sense the reverse of constituent government. It is assumed that the melody hosted by O_3 is a potential governor and the one attached to O_2 is a potential governee for such a relation to take place (Further implications and consequences of such government in terms of consonant clusters and constituent structure of Turkish is beyond the scope of our discussion). Also the fact that N_3 is (parametrically) licensed hence cannot p-govern N_2 indicates that the p-licensing of N_2 is obtained through inter-onset government.[21]

Three types of empty positions can be tolerated in the skeletal structure of GP: Empty Nucleus (Nx), Empty Onset with a point (Ox) and Empty Onset without a point (O). The phonological ECP, as is already discussed above, is a universal principle initially formulating the conditions under which empty nuclei can/cannot be interpreted. However, the status of empty onsets in accordance with this principle is hardly articulated in the GP literature. As for the onsets without a point it is not a big deal, we already have stated that in accordance with Onset Licensing Principle any onset should enter the structure licensed by the following nucleus. That is to say, for an empty onset with a point-either word initially or word medially- we have to account for its silence which is subject to p-licensing— restated below—while there is no need for such an account for empty onsets without a point.

[21] For a detailed discussion of inter-onset relations in Turkish the reader is referred to İskender (2008:122-154).

(19) Empty Category Principle (A revised version)

A p-licensed (empty) category receives no phonetic interpretation

P-licensing: 1. properly governed empty onsets with a point (Ox) must be p-licensed

Proper Government:

α properly governs β (α being a nuclear head and β being Ox) if:

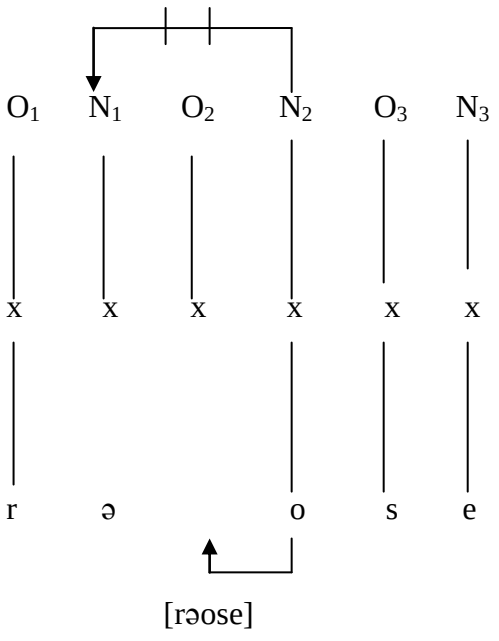
1. α and β are adjacent on the relevant projection (P_0),

2.α is not itself licensed, and

3. no governing domain separates α from β

In accordance with the principle above we will present the environments where Ox was assumed to occur, referring to the previous literature, in (20) below. The French data is taken from Charette (1991).

(20) *rehausser* *[rəose]* 'to raise again'



As can be observed in (20) N_2 is adjacent to O_2 and there is no governing domain intervening in between. Therefore N_2 being an unlicensed nucleus p-governs O_2, which is a lexically empty position, to remain silent. Another important point about the structure above is that, N_1 schwa, which is the realization of an empty nucleus in French, is interpreted. [22] Normally, we expect N_2 to p-govern N_1, however this is not the fact. Charette (1991) proposes that the reason for a failure in p-licensing is the limited power of the p-governor, which having already p-licensed O2 does not have enough p-licensing potential to p-license N_1 as well. In Charette's wording, "A proper governor can only properly govern one and only one empty position" (Charette 1991:93).

Turkish is one of the languages which permits empty categories in the phonological structure of its constituents. The realization of those empty categories can vary to some extent. We consider onsets either with or without a point (Ox), which do not dominate any melody, to occur in the environments where two "phonetically adjacent vowels" are observed e.g., *dua [dua]* 'a prayer'. While empty nuclei can be colored by vowel harmony, specifically the high vowels [i,u,y,ɯ]. Empty categories will be explored in further detail in the following chapters. Now it is time to have a look at the lowest level in the structure, namely the melodic level, and inspect the most outstanding points regarding the segmental composition of the phonological objects.

[22] Note that the p-licensing status of N_1 in (Quebec) French is different from Turkish. Note that the representations in (20) are adapted from Charette (1991:93).

2.3 The Melody: Segmental Representation in GP

Phonological expressions in GP consist of minimal and monovalent building blocks called elements. These elements, which constitute the melodic level of representation, are fully interpretable either on their own (A) or in combination with other elements (A.I) at any level of derivation.[23] This is stated in the Uniformity Condition:

(21) Uniformity Condition

"Phonological expressions are directly interpretable at any level" (Kaye 1995:292).

This condition ensures that there is no place for " underspecification" and that any phonological expression, be it simplex or complex, can directly be mapped from the representation into phonetic signal and vice versa.

The combination of elements is determined by two major factors: the number of elements and the combinatorial restrictions. Regarding the number of elements several proposals were made since KLV (1990).[24] The number has decreased dramatically from ten to five and even to three in the recent theories. The version of the element theory we will be adapting here is a set of 6 elements, as it is presented in Kaye (2000): E: {A, I, U, H, L, ?}. The rough phonetic correlates of these elements are given in the table below.

[23] There have been various views regarding the nature of the elements. Kula (2005: 52) mentions two different approaches: Kaye and Charette (1993 and SOAS GP circle) as proponents of fully cognitivist view while Harris and Lidsey (1995) also pay attention to the acoustic correlates of the elements. Also note Cyran's definition : "The smallest units of representation to which phonology has access are called elements, which are understood as the cognitive objects of both an acoustic and articulatory nature of which segments are composed"(Cyran 1996:2).

[24] See Charette and Kaye (1993), Backley (1995), Jensen (1994), Harris and Lindsey (1995), Nasukawa (1997), Szigetvari (2002), Pöchtrager (2006) for developments in element theory.

Table 1. The List of Elements and Their Phonetic Correlates

ELEMENT	VOCALIC REFLEX	CONSONANTAL REFLEX
A	openness	coronality
I	height/front	palatality
U	roundness	labiality
L	--	slack vocal cords, voice, nasality
H	--	stiff vocal cords, voicelessness, friction
ʔ	--	Stopness[25]

The interpretation of one or more elements in combination is determined by: i) what phonological constituent dominates it ii) whether it occupies the head or operator position within a phonological expression[26] (Kaye 2000: 1).

Besides the number of elements, language specific mechanisms -Licensing Constraints (hence LCs) - are also active in the combination of the elements. LCs restrict the combinatorial properties of the elements, thus defining a possible set of lexical phonological expressions in that particular language[27].

[25]This table is formed on the basis of list given in lecture notes of LING 301 (Denwood 2006).

[26] In a complex expression such as (A.U) an asymmetric relation of headedness may be contracted between the elements. That is one of the elements can be the head and the other element(s) are the operators. It is assumed that there can be only one head in the expression. The difference in the headedness status of the elements is reflected in their pronunciation. For instance (A) and (A), the headed segment being underlined, are different in that (A) is pronounced as a tense vowel while (A) is assumed to be lax.

[27] LC's for vocalic segments are proposed by Charette and Göksel (1996) and LC's for consonantal segments were determined by Balcı (2006) in Turkish. As we will focus on empty categories

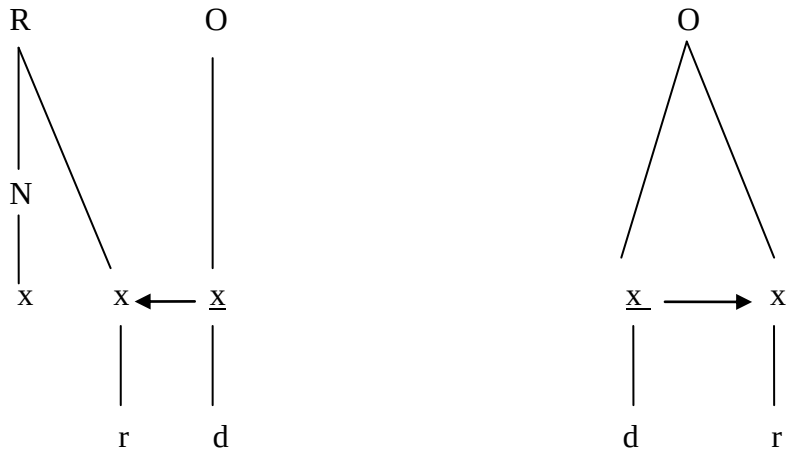
2.4 Substantive Conditions on Government:

Complexity, Headedness and the A-asymmetry

Earlier it has been mentioned that there are two types of conditions to be satisfied in order for governing relations to be formed: formal and substantive conditions. The formal conditions have already been introduced in (10). Substantive conditions are the factors which have to be satisfied in order for some melodic material to be hosted by a head position and for some other by the complement position, either in constituent or inter-constituent governing domains.

(22)

(a) rd as in English ca[rd] (b) dr as in English [dr]op



In (22a) the fact that the head position is occupied by [d] (A.?) and the complement and the complement by [r] (A) whilst in (22b) it is vise versa is determined by a special condition, called Complexity Condition, introduced by Harris (1990).

(onsets) in this thesis we won't be referring to the LCs. The headness status of the elements, determined by language specific LCs, will be ignored. But it should be noted that the LCs proposed for Turkish segmental inventory are not without problems, which deserve a critical re-analysis.

(23) Complexity Condition

"Let α and β be segments occupying positions A and B respectively. Then if A governs B, α must not be less complex than β" (Harris 1990:274).

According to this condition it is only the number of elements which matters in deciding on the governing position to be taken by melodic combination which will be further projected into prosodic constituents. There have been further modifications of the Complexity Condition by Kim (1996:139-167) who also added headedness as another component to this condition. [28] That is, if there are two equally complex elements, the headed one is a better governor than the headless one.

The complexity condition, which is responsible for the well-formedness of governing relations, is not without problems. The condition was introduced in the 1990's when element theory admitted 10 elements. It is obvious that the decrease in the number of elements, which has been a practice for nearly a decade, will have one reconsider complexity (See Pöchtrager 2006:55-57 for further discussion and examples).

Recently, the A-asymmetry (or A governs not A condition as expressed by Kaye (2000:8)), which is still in the state of qualification, has been proposed as an alternative to complexity condition. That is a governed position must/should not contain element A if there is already element A in the governing position.[29]

[28] The complexity condition was not the only condition to determine the substanstive conditions on government. There were also conditions having to do with charm (see KLV 1985; KLV 1990 for details), which were completely dispensed with in the mid 90's. Kim's attempt at headedness was a way to make up for what could not be done anymore, once charm was gone.

[29] See also Pöchtrager (2009: 1-3) for the A-asymmetry and its extensions in the GP 2.0 model.

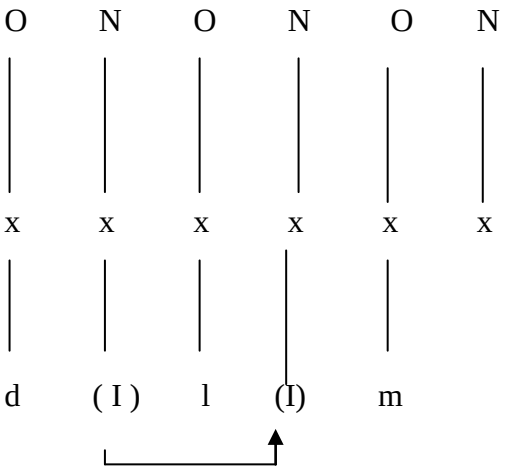
2.4 Phonological Processes in GP

Phonological events (at segmental/melodic tier) can be expressed as two basic processes in GP: fusion/linking/fortition and fission/delinking/lenition of the elements[30] (Kaye 1995:313). In particular, if a process X does not involve either one or the other of the operations -above- it is claimed not to belong to the realm of phonology. It also has to be noted that the source and target in such processes has to be local. Below, we give examples from Turkish *dil* 'togue' and German *tag* 'day' , to illustrate fusion and fission processes respectively.

(24)

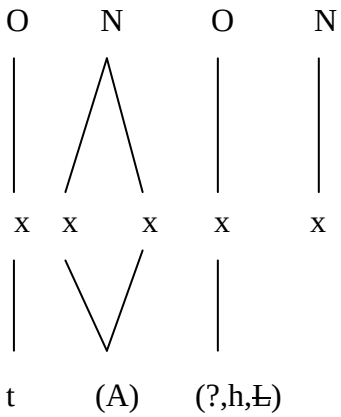
a. Turkish I-harmony

[dil] *[dil+im]*



b. German final de-voicing

Tag *[ta:k]* *[tag+ə]*[31]



[30] Yoshida (1996:23) mentions three operations active in phonological representations: composition, decomposition and switching the head-operator relation. Bercés (2008) also refers to three possible phonological operations in GP: assimilation, fortition and decomposition.

[31] The German example together with the structural and elemental conventions is taken from (Brockhaus 1995b). Also consider the L-lenition account for the German devoicing in the same reference.

In (24a) above we observe the linking of the element I into the empty position via spreading while in (24b) the opposite process, de-linking of the element L in a weak position (the weakness of this position is determined on the basis of the licensing potential it receives from parametrically licensed domain final empty nucleus , in order to license its melody), is at work.

2.5 Identity Avoidance in GP

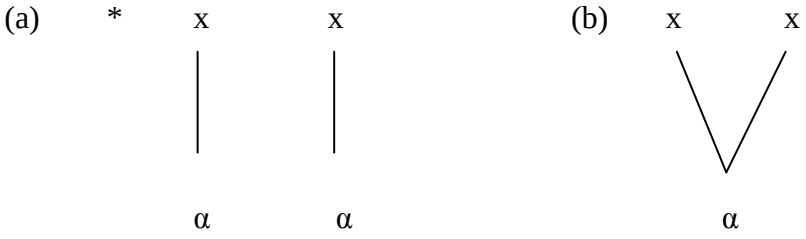
It has been a general practice both in phonology as well as morphology to resolve the occurrence of adjacent identical units. The Obligatory Contour Principle (OCP) has first been introduced as a universal principle of grammar by Leben (1973) in order to reduce co-occurrence of identical tonal patterns. Later on the principle has been extended to the segmental dimension and re-interpreted by Goldsmith (1990) and McCarthy (1986). The OCP as it is adapted to the segmental level, is given below.

(25) Obligatory Contour Principle

"At the melodic level, adjacent melodic units are disfavored" (McCarthy 1986:206).

In GP, the understanding of the OCP has been somewhat inconsistent. For instance, Harris (1994:173) describes the OCP as "a static condition on well-formedness of morphemes as they appear in the lexicon. According to this aspect of OCP, any intra-morphemic geminate cannot constitute a sequence of independent melodic expressions (as in 26a); instead it can only be represented as the simultaneous association of a single expression to two skeletal positions as in (26b)."

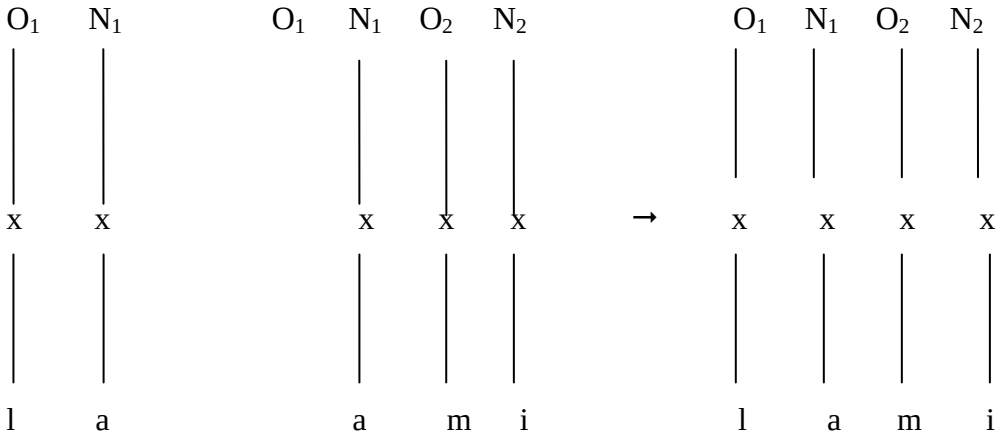
(26)[32]



Harris also notes that OCP remains active throughout the derivation. And that it filters out the processes which cause the violations depicted above by triggering the coalescence of identical melodic expressions.

However, Charette (1991:90) with her famous example from French *la amie* assumes yet another resolution strategy for OCP, illustrated and discussed by Brockhaus (1995: 211-212) in detail. The structure is given below in (27):

(27) *la amie* *[lami]* ‘ the girlfriend’

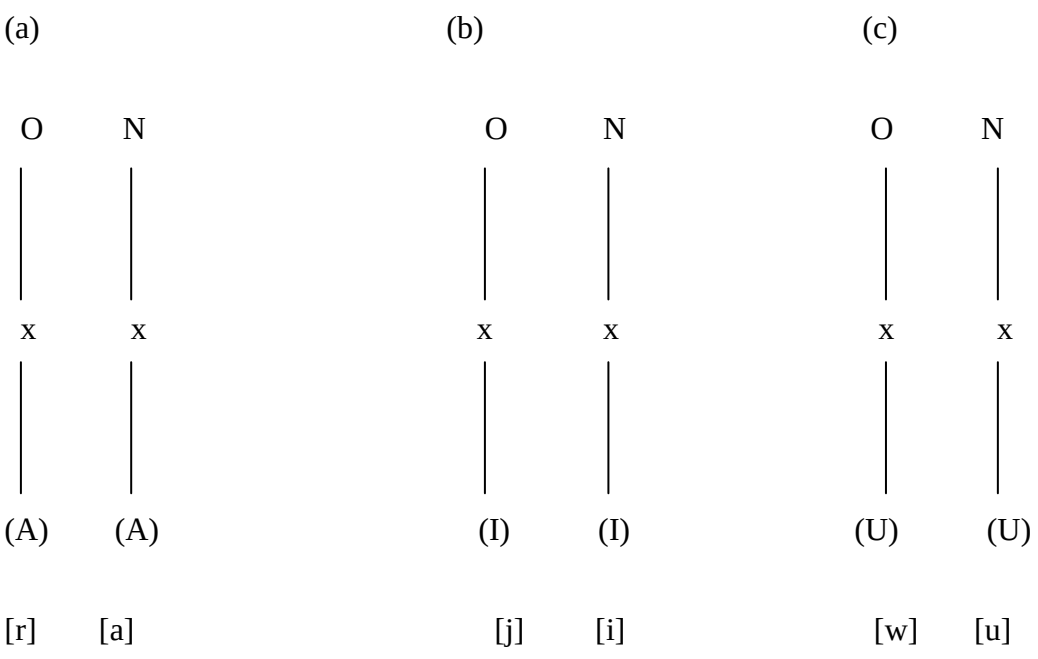


[32] These structures are taken from Harris (1994:173).

It has been claimed that the second domain *ami* begins with an onset without a point. Hence when the article *la* is concatenated with this domain the melody of N_1 of both structures come to stay adjacent. Charette, rightly, sees this case as violation of OCP and the resolution of this violation is suggested as deletion of the leftmost melody together with the nuclear constituent it belongs to. This is counter to expectation. We would rather expect the coalescence of the identical melodies resulting in one element A attached to two skeletal points as is suggested by Harris (this point is also criticized by Brockhaus 1995a).

The missing points about the resolution of OCP in GP can be listed as following: i) How do we know when to use which strategy, coalescence or deletion? ii) If it is the adjacent melodic units at the melodic level that should be avoided, why are the sequences of identical melodies (ar, iy, uw) one hosted by onset and the other hosted by nucleus not excluded at all? As is depicted below:

(28)



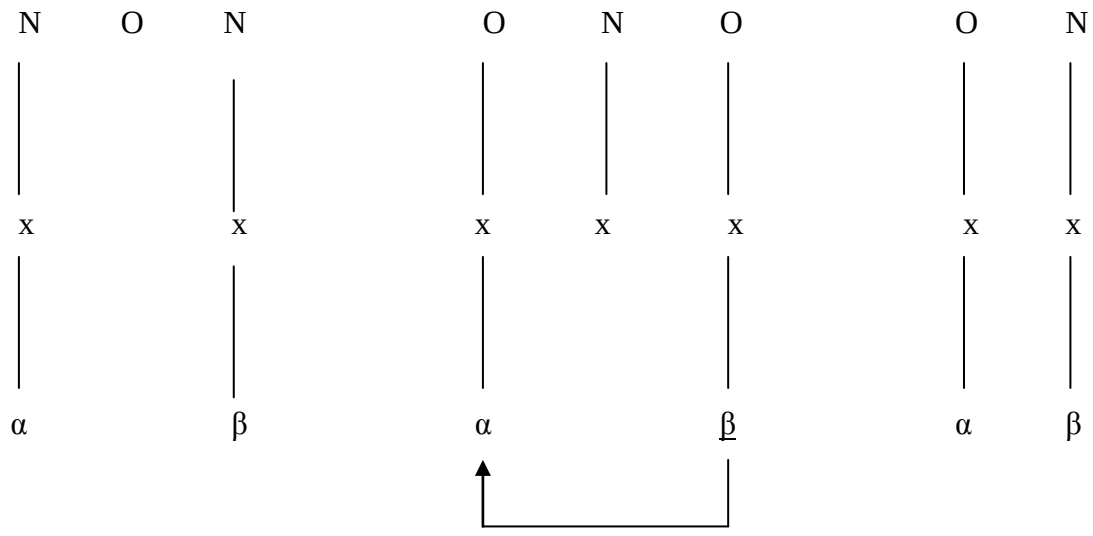
Regarding the first point, the common practice in GP literature is to prefer coalescence as a OCP resolution mechanism. We will also follow this strategy in the course of this thesis. As for the examples such as Charette's, there may be given a fresher look from the viewpoint of morphology involved. More specifically, if one interpreted *la amie [lami]* as one single domain from the beginning, which means there is no derivation where an article concatenates to the stem, and there won't be an environment for OCP to take place. However such an assumption requires further investigation and is a potential subject for future study.

As for the second point mentioned above, it seems that for adjacent melodic units at the melodic level to be avoided there should be a sequence of two skeletally adjacent identical constituents which dominate these melodies (29a).

In GP structure the melodies of two nuclei, two onsets and onset nucleus pair can stay adjacent. Consider the structures below:

(29)

(a) (b) (c)



In (29a) the two melodies α and β see each other as there is no intervening onset point between them. This is a typical environment for OCP resolution to take place in GP. However in (29b) the environment where onset-to-onset government relation takes place, the two melodies seem to be 'somehow' adjacent to contact this government relation, but still this adjacency is different from the one in (29a) in not triggering the OCP resolution. In this case, the two onsets do not see each other due to the presence of intermediate nuclear point. Likewise in (29c) the melodies dominated by O and N are not subject to OCP resolution, though they seem to stay adjacent. Here, as we have already mentioned above, the fact that two constituents are not identical (O and N) prevents the OCP resolution to take place.

Apart from adjacent melodies, also empty constituents are not tolerated in the structure of GP. The theory admits a principle which removes a sequence of empty constituents from the structure (Omission of empty categories can also be taken as a kind of OCP resolution mechanism). According to this principle an empty nucleus immediately followed by an onset with a point is subject to reduction from the structure, as is stated above in its original formulation.

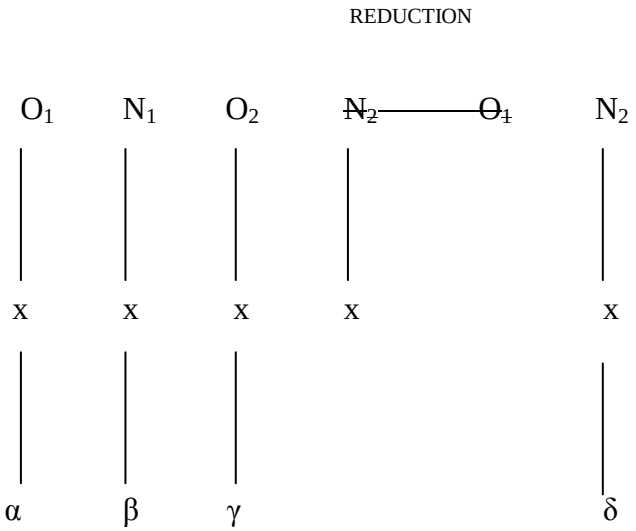
(30) Reduction Principle[33]

"An empty nucleus followed by a pointless onset are removed from any phonological representation in which they occur" (Gussmann and Kaye 1993:433).

Consider the representation in (31) below, where αβγδ correspond to melodic primes (elements).

[33] Also see (Charette 2000: 9) for the revised version.

(31)



The structure above is a typical representation of a stem+ suffix (analytic morphology-to be mentioned below) where a domain final empty nucleus of the first domain (N_2) followed by an empty onset without a point are reduced from the structure as dictated by Reduction Principle.

After giving a quick sketch of the identity avoidance and how it is understood in GP, in the following section we will discuss the morphology-phonology interaction as well as the types of morphology and their effects on phonological structure in the course of derivation.

2.7 Phonology-Morphology Interaction in GP

The scope and nature of phonology-morphology interaction has been an intriguing as well as a challenging topic in the history of phonology for quite a long time, the

assumed nature of such an interaction often determined the route of development of a particular theory of phonology. Various dimensions of this interaction (morphological conditioning of phonological processes, phonological shape of morphological units etc.) have been of great interest both for phonologists and morphologists. An individual sub-field of morphology/phonology, morphophonology has been evolved starting from Trubetzkoy's influential work on Russian mor(pho)phonemics (Andersen 1985) which is quite different from what is meant as phonology-morphology interface in the recent approaches to phonology.

GP being a restrictive theory, it allows only for minimal interplay between morphology and phonology. That is, morphology has either little or no effect on phonological structures. These types of morphology are analytic and non-analytic respectively.

2.7.1 Analytic Morphology

Morphology that is visible to phonology can be observed in two types of configurations:

2.7.1.1 Independent- Analytic Domain:[[A][B]]

To exemplify independent analytic domain we can take a traditional example given in the literature: [[black] [board]]

Each pair of brackets indicates one phonological domain. Phonology applies to each domain individually via φ(phi) function then each domain are merged by concat[34].

φ(concat(φblack),(φ board))

The schematic representation of the independent-analytic domain can be translated as following: "apply phonology" to black first, then "apply phonology" to board, and lastly "concatenate the result of the two" and apply phonology to the result.

If we consider stress assignment as "phonology applied" to both units of the compound above, the stress bearing unit would be the head of the compound, that is the left most member in this case.[35]

2.7.1.2 Dependent- Analytic Domain:[[A]B]

Dependent analytic domain [[A]B] involves a structure of two domains, one (inner) dependent [A] and the other(outer) of independent type [AB] as its name suggests. The application of phonology to this kind of domain can be schematized as following:

φ (concat (φ(A),B))

To interpret this structure; first "apply phonology" to A, then concatenate the result with B and lastly "apply phonology" on the result of this. As Kaye (1995) notes this

[34] Concat merges two phonological strings into one (concat (abc, def)= 'abcdef'), while φ has only phonological string as its argument and applies phonology to this string (φ(X) means apply phonology to the string X).

[35] Each domain bears stress hence we correctly predict a full vowel for both domains. (Brockhaus 1995a)

kind of representation can be confronted in the vast majority of English inflectional: [[seep]ed] as well as derivational morphology: [[dark]ness].

2.7.2 Non-analytic morphology

This kind of morphology is invisible to phonology. Non-analytic domains do not respect the integrity of internal domains as opposed to analytic ones. That is, a non-analytic domain [parental] and a simplex word [go] would be treated equally as one single domain. The structures of these can be formed as following: [A+B] for the former and [A] for the latter.

In terms of classification it is not quite easy to separate types of affixes on the bases of morphology involved in their derivation. Kaye (1995) very roughly classifies regular morphology as being analytic while irregular morphology is considered to be non-analytic in English. However, still a wide-range research is required in order to determine the universal basis of such classification. For instance, in Italian the verbal inflection is quite regular however is of non –analytic type. We will also discuss the relation between regularity and non-analytic morphology giving examples from Turkish in Chapter 4 and Chapter 6.

To summarize, in this chapter we have provided a brief introduction of main concepts and the basic principles of GP we will make use of in the following chapters. The further details will be given in the course of analyses when required. In the next chapter we will be discussing the distribution of "Soft G" in Turkish and its implications for the distribution of empty onsets which in turn have interesting

consequences for a number of phonological phenomena such as vowel coalescence, dağ type behavior, vowel assimilation and k~ø alternation.

CHAPTER 3

DISTRIBUTION OF THE SO CALLED "SOFT G" AND ITS STRUCTURAL CORRELATES IN TURKISH

3.1 Introduction

Government Phonology admits phonological behavior as the only source of phonological knowledge, as dictated by the Phonological Epistemological Principle (Kaye: 2005). Phonological behavior can be considered to have two facets: distribution and alternation.[36] Our focus in this section will be directed towards the distribution of the so called "Soft G" and how this distribution has been accounted for in previous analyses. Also, new distributional criteria based on empty syllabic constituents (Onsets) in Turkish will be proposed.

In what follows we will give a distribution of "Soft G" how it is observed in spelling. This might seem like a weird move in a phonological text, but as we shall see, a similar context is proposed to be relevant in the distribution of /ɣ/ as a new phoneme of Turkish and [ ] as a variant of a /g/ phoneme. We will discuss the missing points of those assumptions and the misleading role of orthography in determining the identity of "Soft G" in Turkish.

[36] Alternation*:* dağ type behavior and k ~ø alternation will be discussed in detail in Chapter 4 and Chapter 6.

Table 2. Attested Environments for "Soft G" in Turkish (orthography based)

Word Initial Position	Word Medial Position	Word Final Position
**	VğV	Vğ
**	VğC	**

3.1.1 Soft G : A new Phoneme /ɣ/ and its distribution

Lees introduces "Soft G" as a new consonantal phoneme: /ğ/. The author claims that " it is necessary to analyze Turkish in such a way that a /ğ/ phoneme is unpredictably introduced by lexical rules into certain morphemes; this phoneme is then later reduced to vowel-length or to zero by automatic phonetic rules" (Lees 1961:7). Below we will give a short sketch of Lees' reasoning to make clear why " Soft G" is given phonemic status in Turkish.[37]

Lees provides the reader with a list of words ending in a final /q/ or /k/ which undergo deletion when followed by a vowel initial suffix (third person possessive in this case)[38] :

[37] It should be noted that Lees' notion of phoneme was that of " morphophoneme" in the meaning used in generative phonology.

[38] Lees notes that the third person possessive has the form –sV, where (s) deletes after consonant final stems and V is subject to vowel harmony.

(1)

(a)	(b)	
ayaq	*aya-ı*	'his foot'
çoq	*ço-u*	'much of it'
inek	*ine-i*	'his cow'[39]

The author states that the final k/q loss before vowel initial suffix, above, is in parallel with the word final (de)voicing facts in Turkish. That is, whenever a word final devoiced segment /b/ appears before a V-intial suffix *(kitap*), it reverts to its voiced form (*kitabı*). In the examples above, according to Lees, one expects the voiced counterpart of k/q—g or γ— to show up in column (b) when a V-initial suffix is attached to the stem. As we do not observe such an occurrence, Lees assumes that the stems in column (a) have word final /g/ or /γ/ which is lost before a vowel initial suffix. The derivation below will make the rule ordering clearer:

[39] We directly take Lees' transcription and translation for the examples. The reader may notice that Lees' phonetic transcription is somehow weird, the author remarks at the very beginning of the book that he borrows the symbols from Standard orthography.

(2)

(a)	(b)
/ayaγ-sı/	/ineg-si/
↓	↓
/ayaγ-ı/ (1) /s/-elision	/ineg-i/ (1) /s/-elision
↓	↓
/ayaı/ (2) /γ/-deletion	/inei/ (2) /g/-deletion
↓	↓
ayaı	inei

The possessive forms of (a) ayak and (b) inek can be seen in the derivation scheme above. Lees assumes that the former has a voiced velar stop while the latter has a voiced palatal stop word finally in their underlying representations. The assumption is that firstly s-elision occurs in both forms, secondly /γ/ -/g/ deletion happens which Lees explains in parallel with final devoicing and finally we obtain forms ayaı and inei.[40]

Lees lists a number of forms which end in vowels but do not take the appropriate form of the possessive suffix (-sI in this case) :

[40] The examples and their transcriptions are directly taken from (Lees, 1961:6) but the derivation scheme is mine, provided for the clarification purposes.

(3)

(a)	(b)	
da:	*da-ı*	‘his mountain’
çi:	*çi-i*	‘its dew’
sı:	*sı-ı*	‘its shoal’

The author compares them with other forms ending in a long vowel (4), claiming that the behavior of the forms in (3) cannot be explained by the presence of final long vowels as the forms in (4), which also have long vowels word finally and still select the (–sI) form of the possessive form, which is the regular pattern for V-final stems.[41]

(4)

(a)	(b)	
bina	*bina:sı*	‘his building’
ara:zi:	*ara:zi:si*	‘his field’

In sum, Lees assumes that the possessive forms of *dağ* and *ayak* behave in exactly the same way, *daı* and *ayaı* respectively, the only difference being in that the final consonant of *ayak* can be construed as a voiced fricative, like in */ayaɣ/*, while the

[41] The behavior of *dağ type* words will be discussed in Chapter 4 in detail.

final segment of *dağ*, cannot be construed and is proposed to be a new consonantal phoneme: /ğ/. "(…) it occurs in just those positions in which a voiced velar fricative is found in Old Turkish and in contemporary Anatolian or Eastern Turkic dialects" (Lees 1961:8) from which it is converted to vowel length word finally and before vowels or to zero between vowels, by automatic phonetic rules depicted below.[42]

(5) Vğ (+) V → V (+)V

(6) Vğ → $\bar{V}$

(Lees 1961:56)

The problem with this analysis is that it involves two separate rules for one single "Soft G" deletion process. That is, in (5) the so called /ğ/ phoneme is deleted between vowels leading to a zero value, while in (6) deletion of the same phoneme leads to vowel lengthening and there seems to be no connection between the process (ğ deletion –vowel lengthening) and the context where it happens. In other words it is treated as a complete accident. Hence, according to Lees nothing prevents the lengthening process from taking place between vowels but not word finally. This aspect of the analysis has been criticized over and over again by proponents of non-linear analyses of the phenomenon. (Clements and Keyser 1983:Sezer 1986).

Moreover, the rules above do not capture another environment of /ğ/ deletion—before consonants-- realized as a vowel length mentioned by Lees.[43]

[42] The claim that /ğ/ occurs as a velar fricative in Anatolian dialects has considered to be one of the main justification for its identity, being a voiced velar fricative. However, neither Lees nor other researchers confirming to his proposal, have ever mentioned that there are also a number of Eastern Anatolian dialects where a voiced velar stop [g] occurs it those specific contexts. Therefore, pointing to dialectal data as a phonetic realization of /ğ/ seems to be dangerous and misleading.

[43] Lees does not mention what kind of consonants can follow /ğ/ in this environment.

Another weakness of such a stand is that it is phonologically impossible to justify two processes in (5) and (6) independently (Sezer 1986: 237). To be more specific, we do not encounter phonological processes which delete a segment either between vowels or word finally, the latter resulting in vowel length anywhere else in Turkish.

Furthermore, the "fully abstract" identity of the /ğ/ – it never corresponds to an audible sound in surface forms – makes the analysis even more arbitrary (This point is mentioned in Clements and Keyser, 1983). However, the followers of Lees' view that /ğ/ is a separate phoneme claim that in some environments it can be pronounced(Aksan 2007:34)[44].

Lees' pioneering work is important in the sense that it was the first theoretically grounded one proposed to describe the behavior and identity of "Soft G" in Turkish, though it is far away from being non-arbitrary, as has been pointed out above. However, we have to note that Lees' proposal has influenced quite a number of researchers to include "Soft G" in the phonemic inventory of Turkish as a voiced velar fricative /ɣ/. (Demircan 1979; Kornfilt 1997; Aksan 1968/2007; Ergenç 2002;Göksel and Kerslake 2005). Consider the distribution of Soft G /ɣ/ assumed in those accounts, stated as following:

-/daɣ/→[da:] in the word final and syllable final position/doG.ru/→ [do:ru]:, /ɣ/ is deleted causing the lengthening of the preceding vowel.

[44] Also see (Konrot 1980) and (Kabak 2006) for perceptual and articulatory characteristics of "Soft G". Later analyses which subscribe to /ğ/ posit phonetic correlates of this phoneme in synchronic grammar. Göksel and Kerslake (2005) note that /ɣ/ is realized as [y] in the environment of front vowels and as [w] in the environment of rounded vowels. Kornfilt (1997) describes this phoneme as a semi-abstract object.

-/a.Gɯr/→ [aɯr]: in syllable initial position (between vowels) /ɣ/ is deleted.

- /ɣ/ never occurs word initially (Such a gap in distribution has only been mentioned in a few words and its consequences have usually been overlooked).

The distribution of /ɣ/ given above seems to be determined on the basis of historical/dialectal evidence. Recall Lees's proposal : "(…) it occurs in just those positions in which a voiced velar fricative is found in Old Turkish and in contemporary Anatolian or Eastern Turkic dialects" (1961:8). Considering the problems with the /ɣ/ -deletion rules in those certain environments (discussed above), one may wonder how the distribution of /ɣ/ was determined. Especially for words like *ağır [aɯr]* 'heavy' or *doğru [do:ru]* 'a straight line', where /ɣ/ is assumed to be deleted word medially, resulting in vowel length in the formerwhile causing no phonetic effect in the latter, the reason for these two contexts to contain a /ɣ/ in the underlying representation (Lees 1961, Demircan 1979, Kornfilt 1997, Aksan 1968/2007 among many others) is not well-justified. At this point we wonder how much orthography is at play in determining the distribution of /ɣ/. That is, it could be the case that the orthography has guided phonologists in the sense that the distribution of the grapheme <ğ> provides support for the proposal that there is a "separate phoneme" in the phonemic inventory of the language.

3.1.2 Soft G: as a remainder of /g/

Another view regarding the status of "Soft G'' suggests that the environments where we find "Soft G" in orthography are the contexts where [g] was eroded in the course of language development due to a number of phonetic constraints, therefore

<ğ> and [g] have been considered to be the variants of the same /g/ phoneme[45]. (Konrot : 1980) More precisely, when determining the distribution of [g], gaps in certain environments were ascribed to elision (or velar softening) of this phonological object [g] in those environments and were characterized with the presence of the " Soft G" in the orthography. The evidence given is the complementary distribution of both objects or their non- occurrence in minimal pairs. Consider the examples given below from (Konrot 1980:22):

(7)

/g/	'ğ'
#_____V gelin 'bride'	V_____V doğa ' nature'
C_____ olgun 'ripe'	V_____C ağla 'cry'
	_____# 'otağ ' large tent'

According to the distribution given above in (7), <ğ> can occur word medially before consonants (*ağla [a:la]* 'cry'), word finally (*otağ [ota:]* 'large tent') and between vowels (*doğa [doa]* 'nature') while [g] is observed only word initially (*gelin [gelin]* 'bride') and after consonants (*olgun [olgun]* 'ripe')[46]. That is, [g] and <ğ> are considered to be in complementary distribution. Also the fact that these objects can form minimal pairs such as : :*aga [aga]-ağa[aa]* 'land lord'; *öge [öge]- öğe [öe]*

[45] Also see, Underhill (1976:10) and Banguoğlu (2007:46), for distribution Demircan (1979 68-72).

[46] See (Konrot 1980:22) for further details.

‘component/ element’ which mean the same thing considered to be a further justification for these two objects to be allophones.

The distribution of “Soft G” as a variant of /g/ given above has a number of problematic aspects as well. First of all, [ ][47]→/g/ correspondence subsumes the assumption that words like *el* ‘hand’-*gel* ‘ come’ where the vowel initial *el* can be considered to contain [ ] →/g/ initially for which we do not have any evidence in the signal.

Second, the fact that minimal pairs cannot be formed and that the examples where [ ] and [g] seem to occur in minimal pairs are instances of free variation which do not differ in meaning,can be questioned. There are a number of minimal pairs and near minimal pairs where [g] and [ ] cause meaning difference[48]. For instance *ağu[au]* ‘poison’-*agu [agu]* ‘gurgle’, *doğa [doa]* ‘nature’ – *yoga [joga]* ‘ yoga’, sığır [sɯɯr] ‘cattle’ – *mıgır [mıgır]* ‘offcast’.

What is more, the proponents of [ ] is the remainder of /g/” view claim that <ğ> as an orthographic sign occurs in the environment where there was [g] earlier in the history of the language. The validity of such an argument is more than questionable, in that even if we define those environments as “a trace of historical g” how would this knowledge have any effect on the acquisition? Furthermore, even if we know that at sometime in the history there was [g] in a word like *doğa [doa]* ‘nature’ how would this information affect the structure of our synchronic grammar?

Moreover, if one has a broader look on the distribution of [g] in Turkish,

[47] [ ] indicates ‘silence’ in pronunciation.

[48] Note that [ ] is assumed to be marked with <ğ> in the orthography.

taking the borrowings into account as well, it will be seen that it is not restricted to the environments stated above in (7). In other words, a closer look into language will provide us with the fact that [g] is not in complementary distribution with [ ], which in turn will prove that the distribution proposed above does not hold and therefore does not support [ ] as a variant of /g/. In what follows, first we will show all logically possible environments for [g] in Turkish, then we will give the attested patterns in contrast with the environments posited for "Soft G".

Table 3. Logical Possibilities for the occurrence of [g] in Turkish

Word Initial Position	Word Medial Position	Word Final Position
gV	VgV	Vg
gC	VgC	Cg
	CgC[49]	
	CgV	

[49] Phonotactic restrictions of Turkish do not allow for a sequence of three vowels *CCC to occur in utterances except for a few cases where word final clusters co-occur with a consonant initial suffix CC#C as in *ku**rt**+**l**ar* 'wolf-PL .'

Table 4. Attested Environments for the occurrence of [g] in Turkish

Word Initial Position	Word Medial Position	Word Final Position
gV- gar	(VgV) [50]- bagaj	(Vg)-lig
(gC)- grev~gırev	(VgC)-dogma	(Cg)-seng
	CgV-karga	

The data given in the table 4 above indicates that [g] can occur in almost all environments attested in Turkish. In some environments, word initially and word medially before consonants, it is more frequent while in others it has a rather restrictive distribution.

In the literature it has been claimed that [g] can either occur word initially or word medially after consonants, word medially between vowels it can only occur in a number of recent borrowings such a *sigorta* 'insurance'.[51] Having searched through the recent TDK (2005) dictionary we have observed that the environment [g] can occur in word medially between vowels is wider than has been proposed, and quite a number of borrowings it occurs in are frequently used in the language e.g., *vagon* (consider the examples in table 5). That is, if we really believe that Turkish does not allow [g] to occur word medially, and that instead this is the environment where we find "Soft G", we would expect words like *vagon* 'coach' to be pronounced as [vaon] which is not the case in the standard variety of Turkish we are referring to here.

[50] The parenthesis "( )" indicates that a pattern is attested in a very restrictive environment.

[51] Underhill (1976)

All in all, distribution of [g] in Turkish given above seems very selective, taking a broader look at the language one will notice that the distribution of [g] alone is not sufficient to assume that " Soft G" is as a variant of /g/.

Table 5. [g] in the intervocalic position in Turkish (borrowings)

VgV	Examples
aga	aga,bagaj,pagan,magazin
age	agel,baget, nagehan
agi	agitato
agu	agu,sagu,aguş
agü	lagün
ago	agop,agora,vagon, fagot
ega	begayet,degaje,mega,negatif
ege	delege
egü	begüm,regülatör
ego	begonya,ego,legorn
iga	çigan, figan, sigara,liga
igu	bigudi, iguana
igü	figür
igo	sigorta,zigon,zigot
ıga	cıgara,tıgala
ıgı	mıgır, mıgırlık
oga	logaritma, nogay, yoga
ogi	logistik, yogi
ogo	logo,logos
öge	öge, döger
üga	dügâh, lügat
ügo	lügol
uga	muganni, rugan, uganda
ugu	guguk
ugo	yugoslav

3.1.3 Soft G: As a grapheme –What do the measurements say?

The orthography-phonology distinction is a very fundamental one in the field of linguistics, however regarding the distribution of "Soft G" it seems that there is a tendency in the field to mix up these two realms. The common belief that Turkish orthography is phonemic, in the sense that each letter corresponds to one of 29 phonemes claimed to exist in the language Konrot (1980), has directed researchers' attention on the "Soft G" which was claimed not to correspond to a particular sound on its own but is only indicated by <ğ> in the orthography. Such a mismatch between orthography and phonology at some point lead a number of researchers (especially the phoneticians) to confuse these two realms. We will give a short literature review of the experimental analyses and their treatment of 'Soft G', discussing the criteria—distribution etc. — they make use of in determining the nature of this object in Turkish.

3.1.3.1 Phonetic Analyses[52]

Quite a number of experimental analyses have been made in order to identify the phonetic identity (phonetic manifestation) of "Soft G" in Turkish. In what follows I will briefly discuss how " Soft G" is manifested in terms of duration and formant values and what it corresponds to as far as acoustic tools (spectrograms etc.) are concerned.[53]

[52] Experimental analyses

[53] "The vocal tract is a complex filter rather like a graphic equalizer. The various resonances of the vocal tract filter out the energy in some frequency regions of the input spectrum which has peaks and thoughs of energy. The peaks are called formants " (Ashby and Maidment 2005:71).

3.1.3.1.1 Selen (1979)

Selen (1979) provides a detailed analysis of the phonetic manifestation of "Soft G", her main focus being the manifestation of "Soft G" between vowels and its effect on the phonetic reflex of surrounding vowels.[54] According to the author, "Soft G" corresponds to a "voiced velar fricative" [γ] which is lost in pronunciation both word finally and word medially. We have to note that Selen's definition of " Soft G" is a bit confusing. Having said that [γ] is a sound existing only in medial and final position in Turkish but lost in pronunciation, she implies that [γ] does not exist at all or to put in another way it does not exist on the surface. But then there are two very obvious questions to ask: i) What is the point in saying that [γ] is a sound if we never have it in pronunciation? ii) Does the writer mix up the orthographic sign used for "Soft G", which she shows as <ğ>, and the sound value ascribed to " Soft G" if there is any? As a matter of fact, Selen points out that the lengthening of the vowels in some environments is due to the presence of <ğ> in these environments.[55] These are the following:

(8)

a- When <ğ> stays as final sound of the word, the immediately preceding vowel lengthens: < *dağ*> *[da:]* 'mountain'[56]

[54] The aim of Selen's study is to indicate sound pattern of Turkish and the method used is a visible-speech method based on F1 and F2.

[55] Note that < > indicates orthographic sign in the text.

[56] Selen also notes that when [γ] is lost word finally, the length of the vowel may be partial *(yarı-uzun).* See for duration of [ɯ] in < sığ> (Selen 1979:53-spec.39). There isn't any clear definition of a "partial length" in the text. The criterion or reference point is for a vowel to be long, is not clear either. See also (Selen 1979:36) for duration of a short, long and "partially long" [u].

b- In the sequence of C+V+ğ+C the vowel preceding <ğ> lengthens : *<kağnı> [ka:nı]* 'oxcart' (Selen 1979: 60).

Here again, the presence of an orthographic (graphical) sign <ğ> is claimed to be responsible for the vowel length, which is not quite possible if we believe in the crucial discrepancy between phonology and orthography.[57]

Moreover, Selen notes that " Soft G" is lost between vowels and she gives details on how vowels which come to stay next to each other after [γ]-deletion, are reflected in the spectrogram images.

That is,

(9)

(i) when "Soft G" is elided between two identical vowels it causes the coalescence of

these vowels ([u:] in *<uğultu> [u:ltu]* 'roar' (Selen 1979:35- spec.21)).

(ii) when it is lost between two different vowels, especially when the second one is more prominent (stressed), the spectrograms are interpreted to show either a diphthong ([aɯ] as in *<ağıt> [aɯt]* 'mourning' (Selen 1979:25- spec.9) or a pseudo diphthong ([oa] as in *<doğa> [doa]* 'nature' (Selen 1979: 33- spec.19)).[58]

[57] The author (as many others) is most probably is influenced by the claim that Turkish orthography is phonemic (see Konrot 1980).

[58] Selen does not explicitly state what a "true" diphthong corresponds to in the spectrogram, in terms of formant values. But when she describes how a true diphthong looks like in the spectrogram, she notes that there has to be an obvious transition from F1 to F2 which is an indication

According to what has been claimed so far, the loss of <ğ> vowel medially causes either a (pseudo) diphthong formation or a vowel coalescence, depending on the quality of the vowels surrounding <ğ>.[59] Recall Selen's definition of " Soft G" that is, a velar voiced fricative [γ] which is lost word finally and medially. So, one may wonder what kind of syllable structure Selen has in mind to claim that a loss of a consonantal segment between two vowels triggers these two vowels to be adjacent and further on to form a pseudo-diphthong/diphthong.

As noted earlier if [γ] is always lost in pronunciation, it is quite misleading to say that there is such a sound in Turkish when the aim is to come up with a pattern of sounds of this language.

Also the terminology used in the text (diphthong, pseudo-diphthong, partial length etc.) is not very clear. It has been noted from the very beginning that the frequency of F1 and F2 is of crucial importance (especially for the interpretation of vowels), in the spectrogram images most of the time it is difficult to observe minor details such as fluctuations which a indicate pseudo-diphthong for example. So we can say that the unclear terminology and blurry phonetic details shake the text's reliability.

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of gliding of the tongue. However in "pseudo-diphthong" there should be no sharp change from F1 to F2 but only a slight transition.

[59] A whole list of diphthongs and pseudo-diphthongs is given in (Selen 1979: 63).

It seems that Selen does not rely on any kind of phonological background. The author interprets the spectrograms with glasses of the first two formants on, which may not be a reliable method to investigate the exact nature of the segments in the sound pattern. As a matter of fact, a sound which may look like a diphthong—in terms of F1 and F2 values-- may not behave as a diphthong. For instance [aj] in the word like <*bay*> *[baj]* 'mister' is claimed to be a diphthong due to its formant values (Selen 1979:65). However when we consider its behavior –any vowel can precede the glide member of the diphthong, the glide part behaves as a consonantal segment in suffixation –it does not behave as a diphthong (a single vocalic segment). Bearing what has been said so far, one should be careful about the sound pattern described only in terms of formant values, as the results can be deceiving and misleading.

3.1.3.1.2 Konrot (1980)

Konrot applies two experimental approaches to determine the phonetic nature of "Soft G" these are: Speech analysis—based on observations of the production of "ğ"—and speech synthesis-based on the perception of "ğ".

In the spectrographic (speech) analysis, two sets of forms were used. In set B, there were forms containing <ğ> in different contexts. Set A, on the other hand, consisted of forms without <ğ> (given in 10 below).

(10)

SET A	SET B
V_1CV_1	$V_1ğCV_1$
CV	CVğ
	$V_1ğV_1$
	$V_1ğV_2$

115 words produced by two native speakers of Turkish, in normal speech, were recorded and 230 spectrograms were generated. By investigating the spectrograms (especially taking into consideration the first and second formants) Konrot noticed that the initial vowels of $V_1ğCV_1$ words were longer than the initial vowels in V_1CV_1. This was interpreted as "ğ" being superimposed on the immediately preceding vowel causing compensatory lengthening of it. The author, notes that taking into consideration only F1 and F2 may be misleading if one wants to determine the articulatory characteristics of the segment in question. In fact, he observed that in most of the spectrograms F2 and F3 came together, forming an articulatory gesture typical of velar consonants. The author was the first to notice such a " velar gesture", however he admits that not all the spectrograms show a clear image of it: "Not all spectrograms show such an obvious velar gesture. Most of the spectrographic (my emphasis) displays of the utterances either show F2 and F3 coming together or show weak portions during the elongated vowel before a transition into the consonants in $V_1ğCV_1$ utterances. This weakening in the upper formants (i.e. F2 and F3) might well be said to indicate a gesture of articulators,

namely the approximation of the back of the tongue towards the velum" (Konrot 1980:20).

Here, Konrot's point was to show that "ğ", in the environments where it is claimed to correspond to a zero value, was not always zero. However, the environments where "velar gesture" was observed to correspond to an articulatory characteristic of "Soft G" were not explicitly stated. It is true that the author gives examples from utterances of V_1ğCV_1 type (e.g., *ağıt*) to show that " Soft G" thereof corresponds to velar gesture in the spectrograms. But besides saying that "most of the spectrographic displays" (quoted in the passage above) show such kinds of gesture, he does not give any further information on whether " ğ" in other environments (given in List B) can also be identified as a velar gesture. Konrot does not argue for the generality of his observations—that the velar gesture is an articulatory correlate of "Soft G" in certain environments or in general—nevertheless there is an immediate question triggered by this " uncommon velar gesture", that is : If not all of the spectrographic images show this gesture (and it is not even clear which ones do show) could it be a minor detail which has very little if not any significance in determining the segmental nature of " Soft G"?

A synthetic speech (perception of ğ) experiment was conducted to test whether vowel length alone --without any possible gestures towards velum-- can be used to "induce the impression" of <ğ>. Konrot by making use of PAT (A parametric artificial talker), synthesized V_1CV_1 e.g., *ada, ala* utterances. The V1 of such utterances were randomly presented to 5 native speakers of Turkish with different duration e.g., *[ada*] and *[a:da]*. The informants were asked to mark the forms from the list of words which do and do not contain <ğ> e.g., *ada [ada]*'

island' , *ağda [a:da]* 'epilating wax' on the basis of what they have heard.

According to the results, vowel lengthening, not being the only cue for " Soft G", is suggested to be sufficient. In other words, Konrot's speech synthesis experiment indicates that velar gesture does not play a significant role in identifying "ğ". It is rather vowel length in the VğV sequences, which is important to determine the presence of "ğ". However there are a few remarks to be stated regarding the methodology and interpretation of the perception experiment: i) To test whether a velar gesture does or does not have any effect on perception of "Soft G", informants are expected to be presented with utterances which are similar in all aspects but velar gesture. Hence, the sequence such as *[a:da]* and *[a✷:da]* (where✷ stays for 'velar' gesture). However the author presented the informants with forms which did not have 'velar gesture' as a variable, so it is difficult to tell then whether the velar gesture does or does not play significant role in perception of " Soft G". As the test was not actually designed in such a way that it could be possible to comment on the role of it in signifying "Soft G". ii) The sound used in this experiment was artificial so it may well be that when the participants heard the sound with longer vowel duration (e.g., *[a:da])* -but without velar gesture-. They might have found it acceptable only because it resembles the real sound –with velar gesture [*a: ✷da*] –. So, we can say that Konrot's technique was not quite appropriate and the interpretation of the results in turn does not truly show the role of "velar gesture" in identifying "Soft G".

Konrot, as opposed to other experimental analyses, relies on a theoretical background while interpreting the results of his findings. The author claims that "ğ" is not a new phoneme as claimed by Lees (1961), instead "ğ" and [g] belong to the

same /g/ phoneme, which he argues for by saying that these two segments occur in complementary distribution. That is, "ğ" can be seen word medially before consonants (*ağla [a:la]* 'cry'), word finally (*otağ [ota:]* 'large tent') and between vowels(*doğa [doa]* 'nature') while [g] is observed only word initially (*gelin [gelin] 'bride'*) and after consonants (*olgun [olgun] 'ripe'*)[60]. On the basis of the above mentioned distribution, Konrot suggests that "the existence of the so-called 'Soft G' in the system of this language should be explained phonetically rather than phonologically" (Selen 1979:22).

We think that if Konrot has the assumption that ' Soft G' is an phonetic variant of /g/ in mind from the very beginning of his experimental study, he might want to come up with a certain phonetic reflex that may indicate the relationship between the two sounds i.e., velarity via gesture or vowel length obtained via loss of [g]. To emphasize it once more, Konrot's main argument was to show that "Soft G" does not have an independent status in Turkish. He claims that it is the Turkish orthography which influences the mainstream of approaches such as Lees (1961) to take the opposite position in determining the identity " Soft G".

3.1.3.1.3 Kopkallı-Yavuz, Kocak, Topbaş, Cangökçe-Yaşar (2008)[61]

This study investigates the function and the phonetic correlates of " Soft G" in Turkish both in casual and in careful speech, with the use of an acoustic analysis and

[60] See (Konrot 1980:22) for further details.

[61] Henceforth (Kopkallı et.al. 2008).

videofluroscopy of the oral and pharyngeal cavity.[62] Two types of words were used in experiments: (C) VC (*ada [ada]* ‘ island’, *denek [denek]* ‘test subject’) and (C)VğC (*ağda [a:da]* ‘epilating wax’*, değnek [de:nek]* ‘bar’) in order to contrast the environments where <ğ> does and does not occur[63]. The informants were asked to produce the words of type mentioned in the line above in minimal pairs both in careful and casual speech[64].

In the acoustic analysis the measurements of Vowel duration, Formants, Transition duration and Transition Formants in the words with and without “ğ” showed that there is no evidence of a (consonantal) segment in the words—like *ağda [a:da]* ‘epilating wax’*, kağnı [ka:nɯ]* ‘oxcart’*, yağma [ya:ma]* ’plunder’ —which contain <ğ> before consonants. Moreover, no changes were observed in the formant frequencies of vowels followed by <ğ>. So, the only difference between the words with and without <ğ> was observed to be vowel duration: The duration of vowels in the former were observed to be much longer than in the latter. Hence, the results of acoustic analysis were reported to suggest that the function of <ğ> is to lengthen the preceding vowel.

However it is difficult to image how a letter (grapheme) -<ğ>- which does not have any phonetic correlates – at least for the words of (C) VğC type - can play any role in a phonological phenomena – vowel lengthening in this case--. The findings of the experiment make it clear that in words of (C) VğC type, where <ğ> occurs

[62] Videofluoroscopy: “The technique of viewing and recording real time X-ray investigation using a video camera. This enables the moving images to be reviewed at a later time, by individual frames or in slow motion”(http://www.encyclopedia.com/doc/1O62-videofluoroscopy.html).

[63] We prefer to show a graphical sign for “ Soft G” with <>, even though (Kopkallı et. al.) indicate it with / / which signifies phonemes. I wonder whether there is any theoretical reasoning behind that, as there is nothing mentioned in the article.

[64] It was assumed that <ğ> is realized differently in casual speech than in careful speech.

after a vowel, this vowel is long (See tables in p.6-10 for vowel durations). Saying that <ğ>, functions to lengthen this vowel has two implications: i) "Soft G" and " the vowel preceding it"—in order to interact—have to be of the same nature, more specifically both have to be phonological /phonetic objects to be able to influence each other. Otherwise, stating that there is "nothing" which has only a graphical representation and function (to lengthen the preceding vowel in (C)VğC words) is not quite a reasonable stand to follow. ii) If there is a vowel lengthening which takes place before <ğ>, it necessitates a vowel to be short at some point—level of derivation etc.—which depends on the authors' theoretical reasoning. However, it seems that the authors do not confirm to any kind of theoretical background which make the reader question how they understand the process of "vowel lengthening".

According to the results of the videofluoroscopic analysis some velar movement and more pharyngeal tension were observed in words containing <ğ> but still there was no evidence observed for the presence of another segment. So, according to this experimental study <ğ> does not have any phonetic properties, rather it is observed to cause the preceding vowel to be tense.

Again <ğ>, which is zero in pronunciation, is claimed to effect the quality of the preceding vowel. However, it seems not to be quite possible as two objects belong to different realms, orthography and phonology, hence cannot interact. Moreover, what the authors refer to as tense vowel (whose tenseness is caused to by preceding <ğ>) is not explicitly stated. Put it in other words, tense vowels are usually long, that is length and tenseness go hand in hand most of the time but in their

wording it is not clear if the authors refer to tenseness as an equivalent of length[65]. If they do not, then one may ask how the vowels, which are claimed to stay before <ğ>, are different from tense vowels in other environments[66].

3.1.3.1.4 Coşkun (2008)

Coşkun has measured vowel durations in the environment of "Soft G" and examined the frequency of the first and second formants in the spectrogram images, and on the basis of his observations he claims that "Soft G" in Turkish is only a grapheme and that its function is to lengthen the preceding vowel (Similar claim was put forward by Kopkallı et.al.(2008)). Accordingly, the pronunciation of words like *soğuk* 'cold' and *ağır* 'heavy' are claimed to be [so:uk] and [a:ɯr] respectively, this is not the pronunciation we have for this words in Standard variety of Modern Turkish. Again claiming that a grapheme effects vowel length is problematic, if one takes seriously the distinction between phonology and orthography.

As opposed to the previous claims (Selen 1979, Ergenç 1991), Coşkun's observations suggest that there are no diphthongs in the words where <ğ> occurs between vowels — *yağış [yaɯʃ]* 'precipitation', *soğan* [soan] *'onion', oğul* [oul] *'son'*—. Instead in this environment the vowel preceding <ğ> is claimed to be long.

[65] Tense vowels: pronounced with greater muscular tension than the norm. Contrast lax. Often, tense sounds are slightly higher [1] (more close) than their lax counterpart (http://www.sil.org/mexico/ling/glosario/E005ai-Glossary.htm#Alpha-T)

[66] It has been put forward that vowels in Turkish are tense (Charette and Göksel 1996, where tenseness is expressed by headedness of univalent elements). See (Pöchtrager 2009), for lax [a] in word final position.

Coşkun also shows a V+ <ğ> relationship with other consonants. That is, <ğ> can be followed by any consonant except ç, j and h and also it can be followed by k, g and y only in compounds (*sağgörü* 'prudence', *bağkesen* 'a special type of insect', *sağyağ* 'cooking butter'). This is the first time one indicates the consonants following <ğ>[67]. However the author does not make any further comments, for instance what can such distribution tell us about the consonantal nature of "Soft G" or at least what was the purpose of identifying all these environments. If only to show where <ğ> as a letter can be observed, then it does not make much sense on phonetic/phonological nature of the segment in question.

3.1.3.1.5 Experimental Analyses: The Problems

It should be clear from the experimental analyses discussed so far that they are inconsistent in determining phonetic nature of " Soft G" in Turkish, even the same spectrographic images are interpreted in different ways (Selen 1979: Konrot 1980: Coşkun 2008). Below we identify a common flaws of these analyses which make one question their reliability and status in linguistic research.

No- theoretical grounding: Most of the analyses discussed above lack theoretical grounding. (except Konrot, 1980). They are based on mere measurements of the segments. Such a stand can be very misleading especially if one's aim is to determine a sound pattern of a certain language. In particular, if one wants to determine whether a certain sound say is a diphthong or not, she/he first has to determine how it behaves and this can only be possible through observing its behavior, distribution and alternation. (Durand 1995: 274) also notes that "a priori

[67] Selen (1979) gives only short notes on what consonant can follow <ğ> word medially.

grounds of physiology or acoustics are not sufficient to determine phonetic properties of sound systems".

Phonology-orthography mess: It seems that in the analyses above phonology/phonetics was mixed up with orthography when the authors claimed that <ğ> has a function to lengthen the immediately preceding vowel (Kopkallı et. al 2008; Coşkun 2008) where a letter is suggested to effect a sound/segment.

Unclear terms : The terms used in the analyses are quite unclear (Pseudo-dipthong, partial length: Selen (1979); velar gesture: Konrot (1980); tense vowel : Kopkallı et. al (2008)) Therefore they cause confusion and shake the reliability of the text, for if one does not understand what the referred term precisely corresponds to, then he will not be able to question the truth of the argument.

All in all, the analyses sketched above are far from giving a coherent phonetic description of " Soft G " in Turkish. It seems that the distributional criteria in those analyses are both spelling and the pronunciation of the utterances and a grapheme <ğ> being an orthographic symbol is claimed to have an effect on a phonological process namely vowel lengthening, which is not quite an acceptable stand if one believes in basic premises of linguistics.

We have tried to show that the distribution of "Soft G" given in the literature in order to identify the status of this item is not reliable. In the next section, giving the representation of the "Soft G" in the structure of GP, we attempt to determine its structural correlates and distributional properties. Furthermore, we shall explore whether there is a one to one correspondence relation between an orthographic sign <ğ> and its phonological counterpart as was implied in the previous accounts.

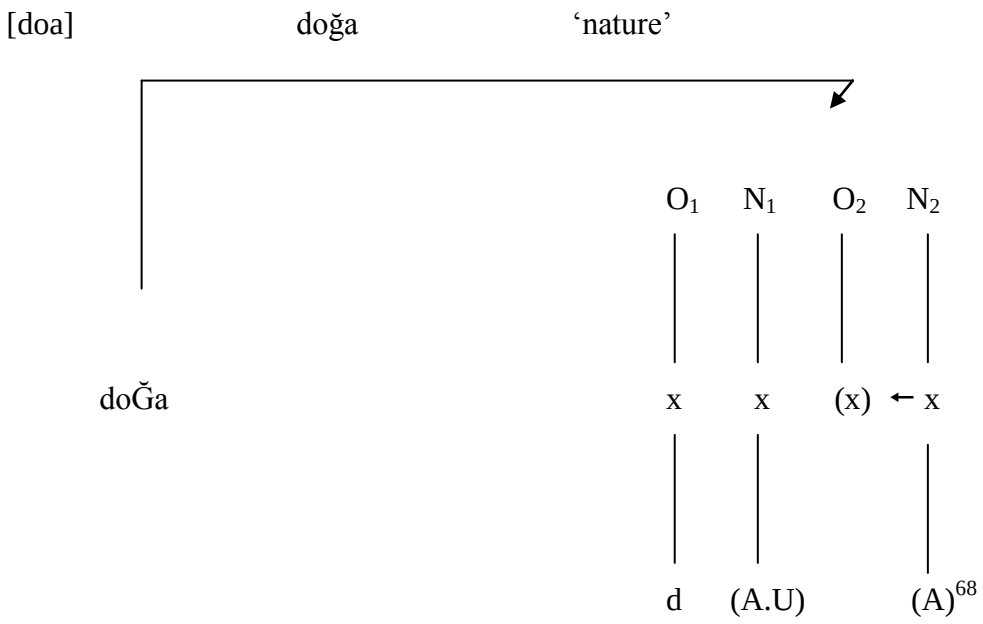
3.2 The Structural Correlates of "Soft G"

In the previous section, it was mentioned that the orthographic sign <ğ> was considered to signify some phonological object e.g. /ɣ/. The distribution of <ğ> as an indicator of a phonological object was proposed to be not satisfactory enough to justify the identity of this phonological object (/ɣ/ or /g/).

In what follows, looking through the eyes of GP, we will try to identify what kind of phonological object/constituent <ğ> signifies. We will claim that the environments where we find <ğ> in the orthography correspond only to a number of contexts where there is an empty onset in the structure. Consider figure 1 below where a number of words containing <ğ> constitute a subset of structures containing an empty onset while there are also some instances where words with <ğ> do not have empty onsets in their representation.

Also consider <ğ> ☞O(x) correspondence relation depicted in the structures below:

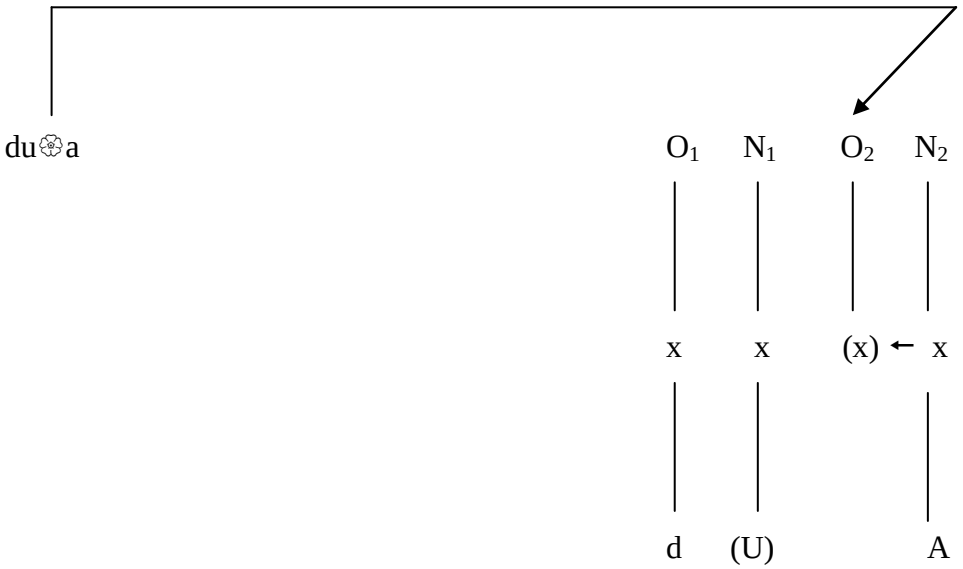
(11)



We assume that <ğ> in utterances like *doğa* corresponds to an empty onset in the structure, however not every O(x) has a corresponding <ğ> in the orthography. For instance, in a word like *dua [dua:]* 'a prayer' we will assume that there is also an empty onset in the structure (the reasoning behind such an assumption is given in Chapter 5), which this time is not indicated with <ğ>. Consider the structure in (12) below where we put ❀ simply to show its structural counterpart as Ox which does not have a melodic or orthographic match :

[68] "(x)" indicates optionality of the onset point in that position which is determined by speech style/rate. This issue will be discussed in details in the following chapters.

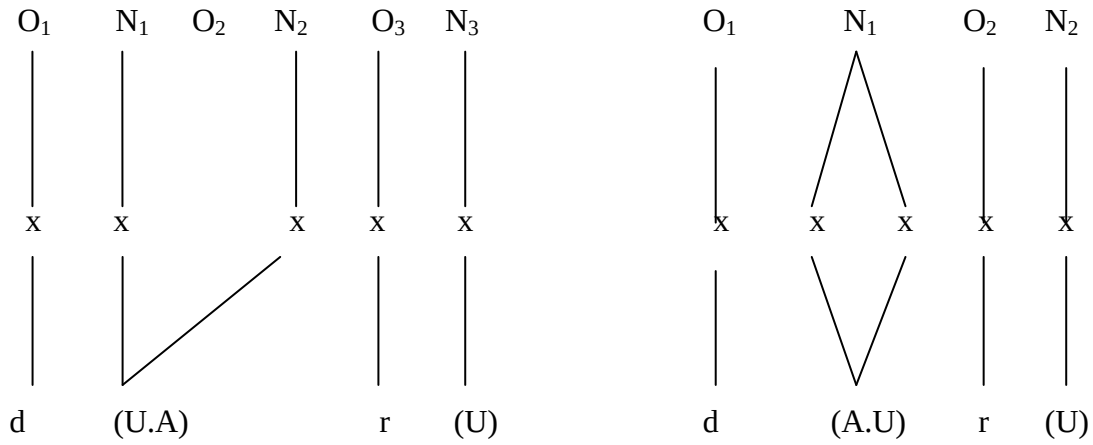
(12) dua [dua:] ‘a prayer’



Moreover, it is not the case that any environment where we find <ğ> in the orthography has O(x) as its structural correspondent. For instance, we will claim that in words like *doğru [do:ru]* ‘ a straight line’ it is not decidable whether <ğ> corresponds to an empty onset there or we simply have a branching nucleus in that context. We will claim that there is nothing in the representation which can give us any reliable cue(s) regarding the right structure (This point will be elaborated on in the following chapters. For the time being it is our concern to give preliminary/introductory assumptions on the distribution of <ğ> and its structural correlates). Consider two (equally) possible structures the theory can generate for *doğru* given in (13) below:

(13)

(a) (b)



All in all, the point we have been trying to make clear here is that a <ğ> ←→ O(x) correspondence relation would lead us astray . And to emphasize once more <ğ> is not a reliable cue to detect phonological entities in one or the other way. We would claim that phonological processes assumed to occur in the environment of <ğ> and " due to its presence" rather take place due to the presence of a certain type of empty onset in those environments. Before that, we shall identify the types of empty onsets allowed in the theory and their distribution in Turkish in accordance with the phonological behavior they entail in those environments. Each environment will be the topic of a separate chapter where it will be explored in further detail.

3.3 Empty Onsets (Ox-O) and Their Distribution

GP allows for empty categories in phonological structure as dictated by the ECP (cf. Chapter 4-sec.2.2). One type of such empty categories are empty onsets. Two sub-types of empty onsets have been identified in the GP literature, described as

following in Gussmann (2002:69): " an onset is empty when it contains no skeletal position, or when it does contain a skeletal position but has not melody attached to it. In both cases the phonetic effect is the same, i.e., no consonant melody precedes the nuclear portion." The former will be referred to as an Onset with a point [Ox] and the latter as an onset without a point [O].[69] Both are depicted in (14a-b) below:

(14)

(a) O
|
x

An Onset with a point

(b) O

An onset without a point[70]

In (14b), we have an empty onset without a skeletal point, not dominating a skeletal point it does not need p-licensing, however its occurrence in the structure still has to be justified/licensed,as will be discussed below. In (14a), on the other hand, an onset dominates a skeletal point which has to be properly governed to stay uninterpreted (silent) and "this government can only be provided by the following [full] nucleus" (Charette 1991:92). Consider the ECP re-stated for empty onsets (also given in Chapter 2) below:

[69] The only constituent which may lack the skeletal point is the onset. (Brockhaus 1995b:193). This follows from the Onset Licensing Principle (Kaye 2000).

[70] There are some analyses where an onset without a point is allowed to "grow" a point under certain conditions, e.g., (Kaye 1995:307-308).

(15)

Empty Category principle

A p-licensed (empty) category receives no phonetic interpretation

P-licensing: 1. properly governed empty onsets are p-licensed

Proper Government:

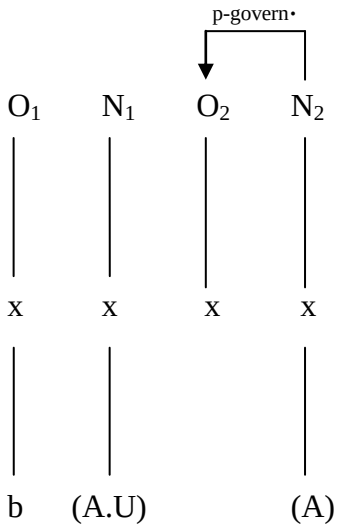
α properly governs β (α being a nuclear head and β being Ox) if:

1. α and β are adjacent on the relevant projection (i.e., P_0),

2.α is not itself licensed, and

3. no governing domain separates α from β

(16) *boğa* *[boa]* 'the bull'



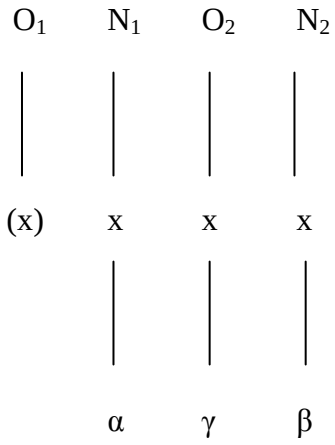
In accordance with the conditions stated under ECP, in (16) above O_2 is considered to be an empty onset (with a point) which is adjacent to N_2 (a realized nucleus) on P_0

and, as can be seen, there is no governing domain intervening between the two positions.[71] Therefore, O_2 is p-licensed through p-government and remains silent.

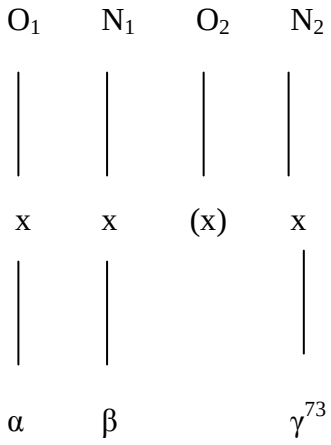
Now let us see how the two types of onsets can be (possibly) distributed in the skeletal structure. Constituents in GP are arranged in such a way that every onset is followed by a nucleus as required by the Onset Licensing Principle.[72]According to these structural requirements, there are two possible positions in the structure where onsets can be found (be they empty or non-empty), either domain initially or domain medially, note again that this also subsumes the final position, as illustrated in the structures below:

(17) Possible Environments for the Distribution of O(x)

(a) Domain/Structure Initial Position



(b) Domain/Structure Medial Position



[71] P-licensing: prosodic licensing; P-government: proper government; P_0: Constituent Projection.

[72] Onset Licensing Principle: "An onset head must be licensed by a nuclear position" (Harris 1992:380).

[73] "α_Y β" represent melodic components of the structure (elements).

The occurrence of empty onsets in initial and medial positions exemplified above can vary from language to language. And also, as it will be claimed for the case of Turkish, the speech style (careful versus casual speech) may also effect the distribution of certain types of empty onsets in certain contexts.

Coming back to the two types of empty onsets, as can be seen in the structures above, both types have the same phonetic effect— silence— therefore the only means for them to differ is their behavior. One of the most popular cases which exemplifies the difference in the behavior of the two onsets is the phonological phenomenon known as *h–aspiré* in French.

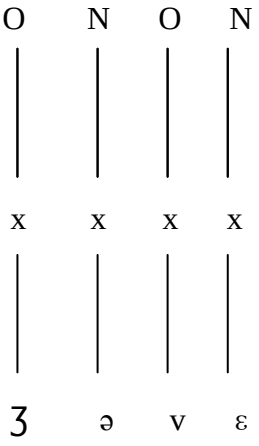
3.3.1 H- aspiré: Evidence for Ox versus O[74]

The fact that a vowel of a(n) (p)article is lost before a vowel-initial word and is preserved preceding consonant initial words is one of the phonological regularities observed in French. Below the behavior of vowel and consonant initial verbs when preceded by the vowel-final pronoun *je* is illustrated.

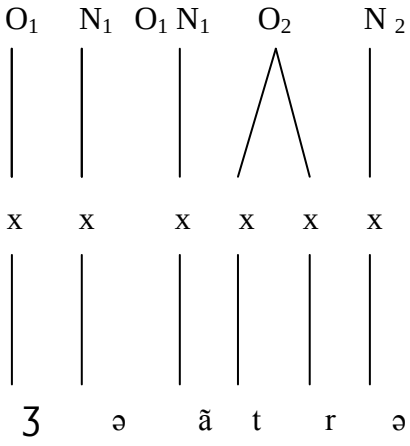
[74] "The term is traditional and comes from the orthography since in Modern French no [h] sound exists. It refers to the situation where some words spelt with *h* exert a different influence upon the neighboring sounds than others; one type of *h* is called h-aspire or 'aspirated h', and the other h-muet 'silent h', even though both are equally silent." (Gussmann 2002:70).

(18)

(a) je vais [ʒ ə'vɛ] 'I go'



(b) j'entre [ʒ ãtrə] ' I enter'



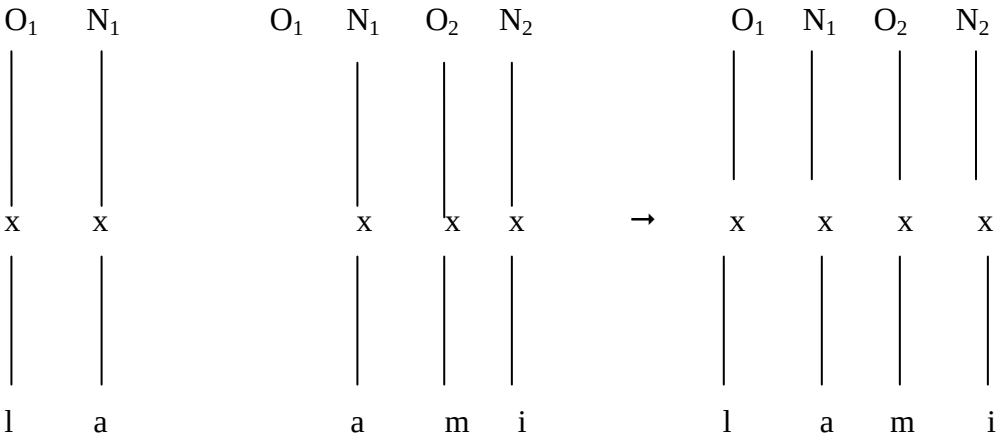
In (18a) above a vowel final pronoun is attached to a consonant initial verb, all the slots are filled and there is no deletion. In (18b) on the other hand, a vowel initial verb is assumed to begin with an onset without a point [O]. Hence N_1 of the pronoun and the N_1 of the stem are adjacent on skeletal level. It is assumed that due to the OCP, the leftmost N_1 must be elided from the structure.[75]

Besides the examples mentioned above there are also some words beginning with a vowel, which, however, display consonantal behavior. In particular, forms such as la hache [la aʃ] which begin with a vowel (h in the orthography), do not cause a preceding article to lose its final vowel. The facts are illustrated below in (19a-b).

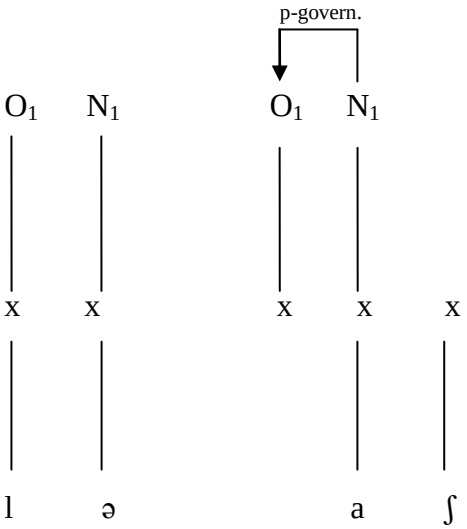
[75] Gussmann (2002:70) only states that the first nucleus is not pronounced, giving no further details why. Charette (1991:90) claims that the first nucleus is deleted as a result of OCP, though later Brockhaus (1995a) criticizes Charette's stand as such an interpretation of the OCP contradicts the Projection Principle and she points out some further problems.

(19)

(a) *la amie* *[lami]* ‘ the girlfriend’



(b)[76] *la as* *[la aʃ]* ‘the axe’



[76] The examples in (18a-b) and (19a-b) are taken from Gussmann (2002) and Charette (1991) respectively and adapted.

(19a) above is similar to (19b) in that here again we see skeletally adjacent nuclei which cannot remain adjacent, thus the leftmost one is deleted. (19b) on the other hand differs from (19a) in that the first onset of the stem dominates a point without a melody and is properly governed by the immediately following nucleus. This onset prevents N_1 of both the article and the following word to be adjacent at the skeletal level, and as there is no adjacency there is no need for resolution of this adjacency, therefore no elision is observed. It seems that French bans nuclear sequences to occur adjacently on the skeletal level.

To sum up the facts above, an onset without a point dominates neither a skeletal point nor melody, therefore it is flanked by skeletally (and melodically) adjacent nuclei. On the other hand an onset with a point dominates a skeletal point therefore is not attached to any melody and falls under the ECP. In French, truly vowel initial stems are considered to begin with an onset without a point while the words which begin with "fake" vowels (orthographic h) and pattern with the one in (19b) in terms of their behavior -in selecting for a vowel final article- are claimed to contain an onset with a point, and such words are called *h-aspiré* words.

In what follows we will present the distribution of empty onsets in Turkish. We shall show that in Turkish we have both types, either domain initially or domain medially, the evidence coming from liason *(ulama)*,vowel coalescence across domains and further processes which we assume to take place in quick speech phonology.

3.3.2 Empty Onsets in Turkish

The distribution of empty onsets in Turkish can be schematized as in the diagram below:

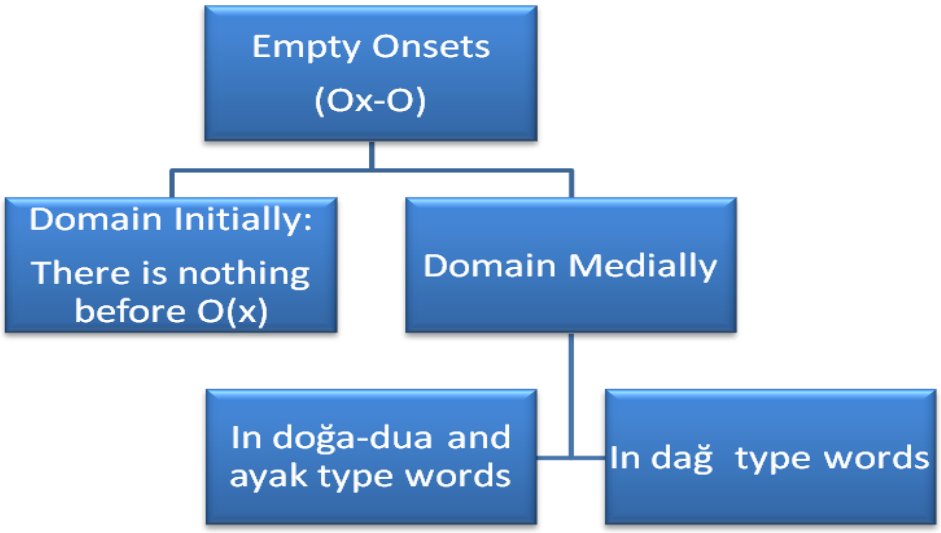


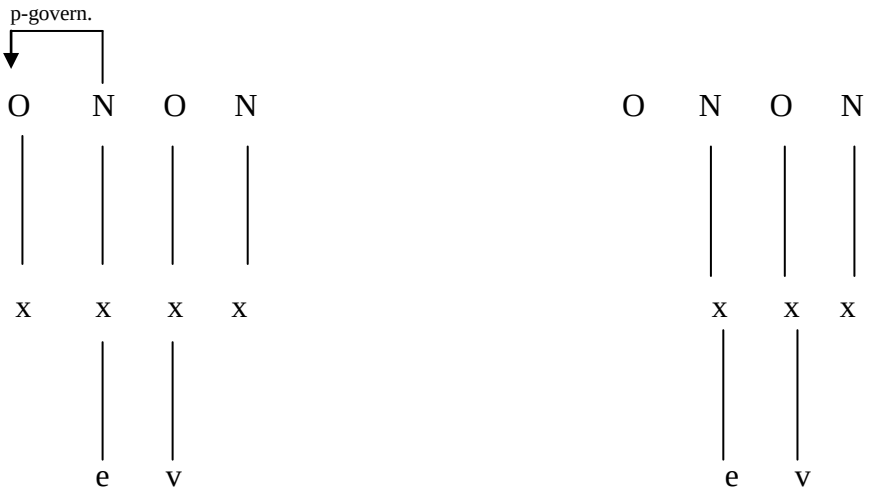
Fig. 1 A diagram showing the distribution of empty onsets in Turkish

Let us first consider the distribution of empty onsets in the (word) domain initial position, which is assumed to be associated with the vowel initial words such as *ev* '*house*', *araba* '*car*', *oda* '*room*'. It is important to note that in previous studies on Turkish the type of domain initial empty onset has not been identified. In particular, two different representations have been assumed for these words: Denwood (1998) claims that vowel initial words should contain an empty onset with a point which is p-governed by the immediately following nucleus while Charette (2000) considers these forms to be composed of an onset without a point word initially. She sees no reason unless theoretically and empirically justified, for vowel initial words not to

begin with an onset without a point. The two rivaling representations of *ev 'house'* are depicted below in (20a-b)

(20)

(a) (Denwood 1998) (b) (Charette 2000)



According to Denwood's representation in (20a), N_1 of the stem is a proper governor of the preceding onset, a fact we expect from all word initial nuclei in Turkish. As the first nuclei of the words are harmonic heads they are assumed to be realized and they are immune to any kind of alternation. Being always realized these nuclei are potential p-governors for their empty onset peers. However there seems to be no further justification for the existence of [Ox] in this environment. That is, the structure in (20b) is neither better nor worse than the one in (20a). There is no concrete reason why O_1-N_1 should be in a p-governing relation apart from mere speculation. Below we will try to justify that it is an onset with a point that should occur at the beginning of vowel initial words, the evidence comes from *liaison* and vowel coalescence across domains.

3.3.2.1 Liaison as an evidence for Domain-initial Ox

In Turkish, when a vowel initial word is preceded by a consonant final one, this consonant tends to be pronounced as a first consonant of the following vowel initial word, in casual/fast speech. This phenomenon is referred to as liaison *(ulama/ulaşma*) (Banguoğlu 1979:Koç 1996).

To make it clearer a number of examples and the structures which allow for a final consonant of the first item to be the first onset of the following vowel initial stem are given below:

(21)

careful speech	casual speech	gloss
a. *aş evi*	*a/şevi*	'public soup-kitchen'
b. *en az*	*e/naz*	'at the very least'
c. *dilim ekmek*	*dili/mekmek*	'a slice of bread'
d. *kardan adam*	*karda/nadam*	'snowman'
e. *yok etmek*	*yo/ketmek*	'to destroy'
f. *ilk okul*	*il/kokul*	'primary school'

As can be observed in the forms above the last consonant of the first word can be pronounced as a part of the following vowel initial word. For instance, the meaning difference between two pronunciations of (the same utterance) *kaşık kaldı*, in careful and in casual speech respectively, *kaşık aldı* 'he/she took the spoon' and *(bir tek) kaşı/kaldı* ' his/her eyebrow is left (to be fixed)' can also be given as an evidence for

k- liaison which takes place in casual speech. Moreover, the fact that the vowel(s) preceding consonants which undergo liaison in casual speech turn out to be lax, word final vowels in Turkish are assumed to be lax (Özsoy 2002, Göksel and Kerslake 2005) can also be taken as a support for the final consonant of the first utterance to be detached from this utterance leaving the preceding vowel as the final vowel of the initial utterance.

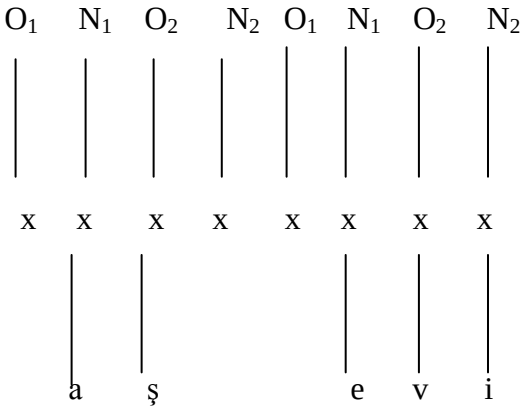
A different version of such a phenomenon exists in French where this time a latent item of a vowel final word appears and is pronounced as a first onset of the following vowel initial word, e.g., *petit livre [peti livR]* 'small book' versus *petit ami [petit ami]* 'small friend'. In English and German on the other hand we do not observe such kind of phenomena.[77]

Coming back to the Turkish facts we assume that a word initial onset with a point, which is subject to deletion in quick speech, and the application of reduction in this context allow for liaison to take place in Turkish. This is illustrated in (22a-b) below:

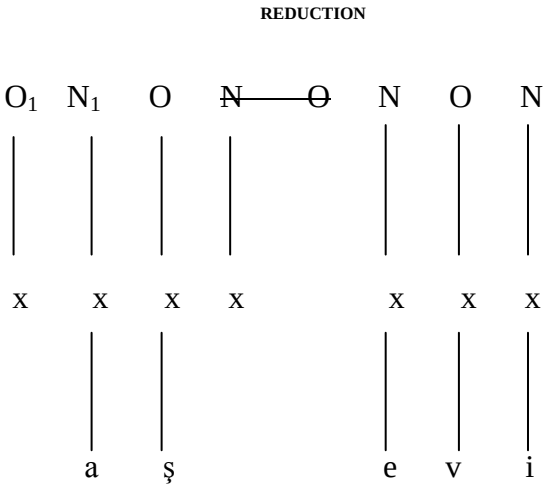
[77] In English some speakers may not differentiate between the words 'an aim' and 'a name' which may seem to be an instance of *n-liaison*. However such a behavior can be accounted for by the specific nature of nasal 'n' involved in these words (p.c. Durand). Also r-linking observed in some varieties of English may be counted as a sub-type of French type *liaison.*

(22) *aş evi* *a/şevi* 'public-soup kitchen'

(a) Careful/ slow speech[78]



(b) Quick/ Casual Speech



Both utterances in (22a-b) above have an analytic- independent structure initially. That is, after the application of phonology independently to both forms it is applied to the final concatenated form (see Chapter 4, sec.2.7).We assume that O_1 of the form

[78] We identify careful/ slow speech as speech type one usually uses in formal contexts while giving a speech at the conference while casual/quick speech is considered to be the speech style one prefers in naturally occurring conversations or formal context. Also see (Ergenç 2002: 53-54) for a further categorization of speech styles e.g., expression speech, reading speech etc.

in (22a) is an empty onset with a point in careful speech. In casual speech on the other hand we assume that an onset with a point (O_1 of the second domain) loses its point, and since it follows an empty nucleus both are subject to reduction as dictated by the Reduction Principle.[79] This is exactly what happens in (22b) above, the word final empty nucleus of *aş* followed by the initial onset without a point of *evi* is elided from the structure, which now only consists of three ON pairs. It seems that the second onset of *aş* becomes the second onset of a final single domain *aş evi.* The fact that the final consonant of the consonant final word becomes a part of an immediately successive vowel initial one can be re-stated as following: When a domain ending in a p-licensed empty nucleus precedes the one beginning with an onset without a point they are concatenated and form one single domain, hence the integration of the second onset and its pronunciation as a part of the second ON pair of this domain. We also have to note that in terms of stress the two domains still preserve their original stress. So, one may ask whether we want to count them as one domain or two separate domains; after all semantically we still perceive them as two different domains.

One may wonder why we do not have a domain initial onset without a point both in careful and casual speech.[80] We assume that if we had an onset without a point, we would have liaison effect in both styles. But this is not the case. *Aş evi* can either be articulated in such a way that the two words are pronounced separately or as *a/şevi*. For instance, in German a compound such as *Abendessen* 'dinner' (*Abend* 'evening' and *Essen* 'meal') cannot be pronounced as *Aben/dessen*. It is probably

[79] "An empty nucleus followed by a pointless onset are removed from any phonological representation in which they occur" (Gussmann and Kaye 1993:433).

[80] The erosion of (x) in quick speech will be discussed in the following chapters as well.

the fact that in German, and likewise in other languages which ban liaison, vowel initial words contain an onset with a point, which they can never lose, in their phonological structures.

The liaison facts mentioned above constitute one of the few tools to test the existence of domain initial Ox in Turkish, as there are not many other word initial phonological regularities that would give us a clue. For example, we cannot look at prefixation since the prefixes found in the language are mostly borrowed, hence are not a good testing ground for explaining what happens in majority of the forms. Another justification for domain initial Ox comes from a phenomenon known as vowel coalescence.

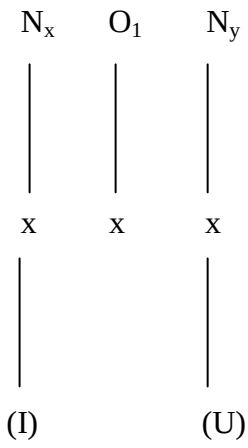
3.3.2.2 V-coalescence (across domains) as an Evidence for Domain-initial Ox

Demircan (1981) in his article on "Syllabification in Turkish" discusses sequences where the first word ends in and the second words begins with a vowel. The author states that the syllabification of these vowels can be done in such a way that either both vowels are pronounced separately (in careful speech) or the former completely assimilates to the latter resulting in a long vowel (in quick speech) under certain conditions. For instance, in two successive utterances (being also an idiom) like *eli uzun* 'thievish' the last vowel of the first word and the initial vowel of the second domain can be syllabified as two separate vowels (with a glottal stop in between : Demircan's assumption) or this sequence can be produced as [u:] where the first vowel completely assimilates to the latter. Later we will give further details of this process, for the time being we only suggest that in careful speech the second domain

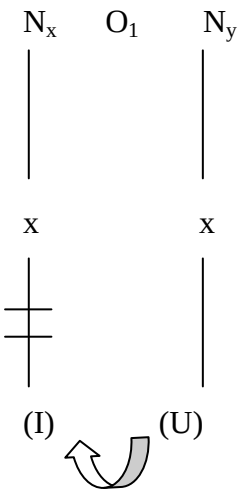
has an initial Ox while in casual speech there is an O which provides the environment for vowel coalescence. Consider the structures below where we only show the final nucleus of the initial domain and the initial onset and its nuclear peer of the second domain :

(23)

a) slow speech: *eli uzun*



b) quick speech: *elu:zun*



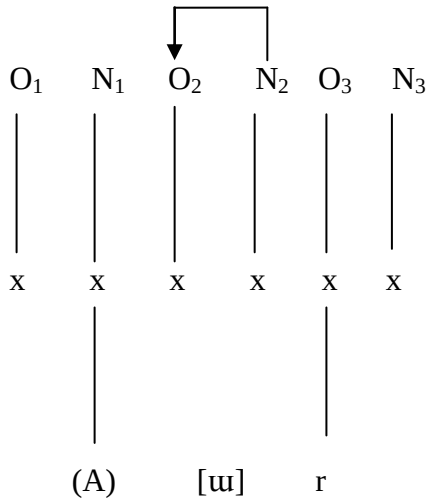
In (25a) it is assumed that due to the existence of an onset with a point in that environment we have e(ʔ)u as the pronunciation, where the melody of N_x and N_y are pronounced separately while in (23b) the melody associated with N_x undergoes a complete assimilation to the one dominated by N_y resulting in a long vowel [u:] in this case. The whole process of derivation will be discussed further in Chapter 5, for now we give only the preliminaries of our assumptions.

3.3.2.3 Distribution of Domain Medial Empty Onsets in Turkish

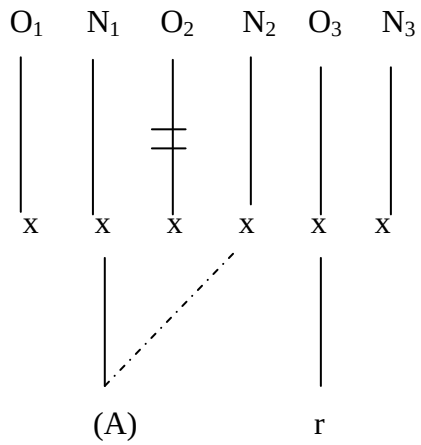
We consider two specific contexts for empty onsets to occur in structure/domain medially as depicted in figure 2. Empty onsets that occur preceding a non-final nucleus and those occurring in *dağ type* words (We will follow Charette (2008) in defining the domain boundaries in Turkish, for further details see Chapter 4-sec.4.7.1).[81]As for the former ones, we posit that in words *like ağız [aɯz]* 'mouth' an empty onset can occur domain medially either with a point in careful speech or without a point/or hosting a melody in casual speech.[82] Consider the structures in (24) below:

(24)

a. *[aɯr]* careful speech



b. *[a:r]* casual speech



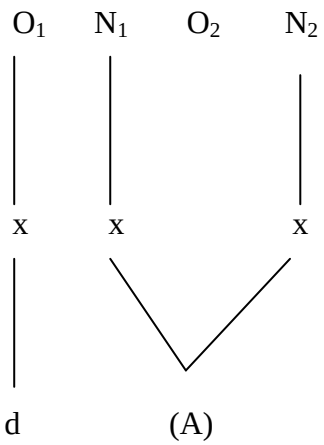
[81] Note that according to Charette (2008) any domain in Turkish must end in a domain final empty nucleus.

[82] The fact that empty onsets with a point cannot be tolerated in quick/speech phonology and the strategies applied to ban their occurrence: i) deletion of a skeletal point ii) filling the empty skeletal slot of Ox with melody via element spreading(from an ambient source) , will be discussed in the following sections.

As can be seen in (24a) O_2 is p-governed by N_2 (a non-p-licensed nucleus). Therefore it is silent, whereas the same O_2 loses its point in quick speech (24b) providing a context where N_1 and N_2 become skeletally adjacent. We will claim that this is the very context where processes such as vowel assimilation (or A spreading), monopthongization (or nuclear/melodic merge) take place due to the absence of an empty onset with a point.

Empty onsets in *dağ type* words, on the other hand, can only occur without a point in that position. Consider the structure below we suggest for *dağ-type* words, which will be justified in Chapter 4:

(25) *dağ* *[da:]* 'mountain'



Note that the structures given above to exemplify the distribution of empty onsets domain initially and medially in Turkish (22-25) are preliminary. The full representations will be given in Chapter 4 ,5 and 6.

The distribution of empty onsets in Turkish conditioned by speech style is summarized in the table 6 below:

Table 6. The Distribution of O(x)'s in Turkish

Type of an empty onset	Initially	Word/Domain Medially	Domain Medially in *dağ-type/ayak type*[83] words
O	Fast speech	Fast speech	Both in fast and quick speech
Ox	Careful speech	Careful speech	--

In this chapter first we have given the distribution of " Soft G" as it was presented in the previous accounts. Then we have show what kind of problems the distribution of "Soft G" ,which is assumed to be in parallel with its orthographic counterpart <ğ>, generates. Second, we have illustrated the structural correspondents of " Soft G", which are often but not always empty onsets with/without a point. We identify the distribution of these empty onsets in the structure of careful and casual speech which is reflected in a number of phonological phenomena such *as dağ type* behavior, vowel coalescence etc. In the following Chapter we will give a detailed analysis on the domain medial onsets which occur in *dağ type* words. First we will identify the identity and the structure of *dağ type* words then we will propose their behavior in vowel initial suffixation, in GP terms.

[83] The details on *ayak type* words will be given in Chapter 6.

CHAPTER 4

DAĞ TYPE WORDS - VOWEL LENGTH IN TURKISH

STRUCTURE AND BEHAVIOR

4.1 Introduction

As has already been stated, in Turkish there are a number of forms which end in a long vowel, <ğ> in orthography. However behave as if they had a final consonant when a vowel initial suffix is attached to them, as in *dağ* [da:] *'mountain'* but *dağı* [daɯ] 'mountain-3 SG.POSS.' We will refer to these forms as *dağ type* words, the term first introduced by Clements and Keyser (1983) and later on used extensively by Sezer (1986). Consider also the words in the Table 7 below:

Table 7. VĞ sequences in the word final position in monosyllabics and bisyllabics

VĞ sequences	Final Position in Monosyllabic Words	Gloss	Final Position in Bisyllabic Words[84]	Gloss
eĞ[85]	*değ- [de:]*	'to touch'	**	**
iĞ	*çiğ [tʃi:]*	'raw'	*tebliğ*	'declaration'
üĞ	**	**	*tebellüğ*	'being informed'
öĞ	*böğ [bø:]*	'parasite'	**	**
aĞ	*yağ [ya:]*	'oil'	*dimağ*	'brain'
ıĞ	*yığ- [jɯ:]*	'to clutter'	**	**
uĞ	*tuğ [tu:]*	'plume'	*bulûğ*	'puberty'
oĞ	*doğ- [do:]*	'to be born'	**	**

We have compiled a list of attested monosyllabic or bi-syllabic words in Turkish ending in <ğ> (given in table 7), in order to see whether any vowel can be long/lengthened in the environment of "Soft G" or if there are any systematic gaps. As can be observed in table 7 above, there are no systematic gaps for either monosyllabic or bi-syllabic words. That is, if a VĞ sequence is missing for monosyllabic forms we find the same sequence in bi-syllabic ones, which means that-word finally- there are no restrictions on VĞ sequences in the language.

[84] *Dağ type* words were considered to be (monosyllabic) native Turkish stems , here we show that words like buluğ which are Arabic borrowings also exhibit dağ type behavior and should also be listed under *dağ type* words. In this thesis (due to the space restrictions) we will follow the usual practice and refer to the monosyllabic words.

[85] Ğ corresponds to "Soft G" <ğ> in orthography; ** represents a lexical gap; < > indicates orthographic forms in the text.

In what follows, first, we will give a short literature sketch of the previous analyses on dağ type words and their behavior in vowel initial suffixation, then we will put these forms in the structure of GP and compare them with other types of length in Turkish—*bina type* and *merak type*—. Finally we will re-consider the *dağ type behavior* and evaluate the consequences of our assumptions.

4.2 Literature Review on Dağ type words and Dağ type behavior

4.2.1 Linear Analyses

4.2.1.1 Lees (1961)

Lees, comparing the behavior of *dağ type* words with words like *bina* ' a building'—both ending in a long vowel—, observed the following when a vowel-initial suffix was added: while a word like *bina* selects for a vowel initial suffix which appears with its buffer consonant {-si} → binası [bina:sı] 'building- 3 SG.POSS.', the typical behavior of vowel final stems in Turkish. On the other hand, *dağ type* words select for a vowel initial suffix {-I} which this time appears without its buffer consonant, dağı [daɯ] 'mountain- 3 SG.POSS.', what we usually expect for consonant final stems. Based on this difference, Lees claims that *dağ type* words should be considered as having an underlying final consonantal phoneme, which is a voiced velar fricative that is converted to vowel length by automatic phonetic rules. In other words, according to Lees, the underlying representation of a word like *dağ [da:]* is /dağ/, where a short vowel /a/ is followed by /ğ/ which corresponds to a voiced velar fricative[86]. This phoneme is deleted word finally or before consonants,

[86] IPA sign for a voiced velar fricative: /ɣ/

which in turn triggers lengthening of the preceding vowel, as is suggested by the following rule[87]:

(1) $V\check{g} \rightarrow \overline{V}$ (Lees 1961:56)

There are two important points regarding the representation of *dağ type* words: i) the identity of the underlying word final phoneme ii) the relationship between the two processes (ğ-deletion and vowel lengthening) considered to take place in the derivation of this word.

Lees claims that the word final underlying segment in *dağ type* words is a voiced velar fricative /ğ/, which, as the author articulates it, corresponds to the so called " Soft G" or yumuşak-G in Turkish. The evidence Lees gives for this voiced velar fricative, which we do not normally observe in pronunciation, is dialectal data: "/ğ/ occurs only in just those positions in which a voiced velar fricative is found in Old Turkish and in contemporary Anatolian or Eastern Turkic dialects." (Lees 1961:8) Such a position has been criticized by a number of researchers (Clements and Keyser 1983; Sezer 1986) for being too abstract and arbitrary. The criticism consists in that *dağ type* words' behavior in vowel initial suffixation can only reveal that there is some kind of consonantal object in the representation, however one cannot posit its properties for sure, as there isn't any cue for that in the signal. Furthermore, giving dialectal data as evidence for an item which does not exist on

[87] Lees also proposes a /ğ/ deletion rule between vowels, in words like ağız [aɯz] 'mouth': $V\check{g}(+)V \rightarrow V(+)V$

the surface in the synchronic phonology is problematic from the acquisition perspective. How would a child who has not been exposed to certain dialectal data in one or the other way construct a representation where there is a final voiced velar fricative which he/she is not hearing in the spoken language? Also, saying that /ğ/ is a new consonantal phoneme which is the so called "Soft G", has the implication that the author is somehow referring to the orthography as "Soft" is the orthographic sign <ğ> in Turkish. At this point one may question the effect of orthography on phonological argumentation which is rather dangerous in linguistic analysis. Another point regarding the representation of *dağ type* words is the two processes claimed to be involved in its derivation (ğ- deletion and vowel lengthening). A linear notation (Vğ → V̄) does not tell one whether these processes apply at once or whether there is an ordering relation or a dependency of some type (for compensatory purposes for instance) between these processes. In short, a linear representation seems to be inadequate in explaining the derivation (if there is any) taking place in *dağ type* words (This point is also discussed extensively in Sezer 1986:232-238).

As for the behavior of the *dağ type* words with vowel initial suffixes, Lees assumes that it is due to the consonantal phoneme in the deep structure of these words that they select for the vowel initial suffix. That is, the author accounts for the word final consonantal behavior in *dağ type* words by positing an underlying consonantal segment in its structure. However he does not discuss the trigger for the vowel shortening in those words. In particular, the fact that we have *[daɯ]* instead of *[da:ɯ]* is not referred to at all. This gives one the impression that the analysis of the *dağ type* behavior provided by Lees is neither a detailed nor a complete one, in the sense that it does not capture all the processes involved in the derivation.

4.2.1.2 Sezer (1986)

Sezer suggests a fully concrete analysis (earlier referred to by Clements and Keyser 1983) in which he assumes that *dağ type* words end in long vowels underlyingly and their behavior in vowel initial affixation can be taken as a lexical exception. He also proposes the following vowel shortening rule to apply to *dağ type* words when a vowel initial suffix is attached to them:

(2) [+syll,+long] →/ [-long] _____+[+syl]

The rule above requires long vowels to shorten when followed by a vowel-initial suffix. (Sezer notes that this behavior is only specific to *dağ type* words, cf. *bina [bina:]* ‘ building’ and *binaen [bina:en]* ‘ based on’, for the cases where a long vowel is not shortened before a vowel initial suffix among the other examples given by the author).

In the same article, Sezer refutes his proposal saying that it denotes a number of additional mechanisms such as, marking *dağ type* words as lexical exceptions, adding a vowel shortening rule to the phonology of Turkish, exclusively for these forms.

As one of the most prominent aspects of a scientific theory/method is to minimize the number of ad hoc mechanisms in explaining processes, we would claim that a number of additional mechanisms assumed to explain the behavior of *dağ type* words takes the analysis far away from being explanatory.

4.2.2 Non-linear Analyses

4.2.2.1 Sezer (1986): An Autosegmental Analysis

Sezer presents a CV type analysis to account for the representation of word final vowel length in *dağ type* words, which he refers to as compensatory lengthening (CL), and *dağ type* behavior.[88] The author's theoretical tools are: General principles of CV phonology adapted from Clements and Keyser[89] (1983), an association principle specific to Turkish and the "Hierarchy of Deletion Principle" listed below.

(3) General Principles of CV-phonology:

I. A string of C's and V's that phonologically help to represent the functional positions in a syllable mediates between the syllable tier and segmental tier

II. Deletion rules may delete the representation of a segment at the segmental level without affecting its corresponding unit at the CV-tier

III. A segment may be multiply associated with CV-tier units without creating crossing associated lines

IV. A segment associated with two units of CV-tier phonologically defines a long segment

V. Syllable initial consonants are maximized to the extent consistent with the syllable-structure conditions of the language in question, and the output of

[88] The CV –model we are focusing on here is based on Clementsand Keyser's (1983) formulation, influenced by McCarthy's (1979) CV-tier conception proposed for Semitic (see Clements and Keyser 1983, McCarthy 1979,1981,1983 for details).

[89] Clements and Keyser (1983) give examples from Turkish *dağ type* compensatory lengthening in order to justify the existence of the CV-tier in phonological representations.

every rule is re-syllabified according to the well-formedness conditions of the language.

(4) Language (Turkish) Specific Principle:

"Association of segmental units to CV units is only tautosyllabic and progressive to the right."

According to this principle associations to the left or across syllables are banned.

(5) Hierarchy of Deletion Principle:

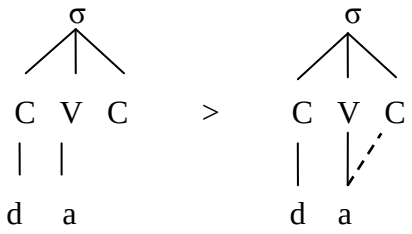
"Unless otherwise stipulated, a deletion that applies at the segmental tier does not remove the associated CV unit. Deletions applying at the CV-tier automatically remove the segmental representations."

This principle indicates two types of deletion processes, the former operating at the segmental level which affects only segmental units, the latter affecting both the CV-tier and the segmental tier. This principle also emphasizes an interdependent non-reciprocal relationship between the two tiers.

Given the principles above, let us see how the CV-type model operates in *dağ type* nominative and possessive forms.

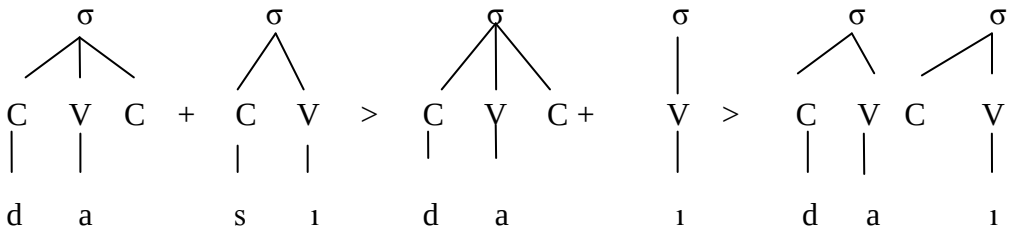
(6)

(a) *dağ* *[da:]* ‘ a mountain’



As can be observed in (6a) above, it is assumed that *dağ type* words contain an unassociated (empty) C-slot in their underlying representation which is subject to association with the segmental material to its left following the language specific principle which dictates that the association process can take place only within the same syllable and only rightwards.

(b) *dağı* *[daɯ]* ‘mountain- 3 SG.POSS.’



The derivation of the possessive form of *dağ* ‘mountain’ is claimed to take place in three stages, as is depicted in (6b) above. The first one is the underlying representation of both suffix and stem. In the second stage, we observe deletion of

the suffixal C-slot, in accordance with the Hierarchy of Deletion Principle. In the third stage we observe re-syllabification as dictated by the fifth principle of the CV-model stated above. Here the empty C slot of the stem cannot be associated with the nuclear melody of the second nucleus as no leftward association is allowed by language specific association principle and also because these two are considered not to be tautosyllabic.

The weaknesses of the analysis lie at the heart of the theoretical ground the CV-model is built on. First of all we see no reason why a vocalic segment should be associated with consonantal slot, depicted in (6a) (A point criticized by Fox 2002:75 as well). Second, if one assumes a preservation and unity of phonological representations throughout the derivation processes as a necessary condition of a phonological theory, then the altering processes such as re-syllabification in CV-model (also deletion of C/V- slots in suffixes e.g. possessive {-(s)I}) which allow one to play around with the phonological structures in more or less random manner would increase the generative power of the theory .

Also, it is not clear why the deletion of the suffixal C-slot in the second stage of the derivation in (6b) is done in that certain environment. This process can be claimed to occur in accordance with the Hierarchy of Deletion Principle which requires the deletions done at the CV-tier to automatically delete segmental material associated with this. However we still have the question, why should the filled C-slot be deleted there? Is it the fact that we cannot have two C-slots in a row? But then we should not expect the existence of forms like tepsi *'a tray'*, either, where there have to be two successive C-slots which host [p] and [s] respectively, in the representation.

Furthermore, there is an ordering relationship between re-syllabification and association of the underlyingly unassociated C or V-slots in derivation in (6b). To be more specific, it seems that there is an extrinsic (prespecified) ordering relation between the re-syllabification and association of the underlyingly unassociated C or V-slots. For instance, in the third stage of derivation it is the assumption that the re-syllabification of the second C-slot of the stem to the suffix which prevents it from being associated with the vowel of the preceding V –slot dominating [a]. There is no trigger present in the representation which requires the ordering relation to take place in that manner but not the other way round. That is, nothing prevents us from assuming that the [a] would be associated with the immediately following C-slot (in the third stage of derivation) leading to the realization of *[da:ɯ]* form, which is not attested.

4.2.2.2 Denwood (2002): A Government Phonology Approach

Denwood (1998) describes monosyllabic words ending in <ğ>, as a number of Turkish stems which have a final long vowel historically derived from lenition of the final consonant. By "derived from lenition of the final consonant" the author assumes that the cause of the V-lengthening is the deletion of the word final consonant. Such a compensatory relationship is claimed to be triggered by the template constraints proposed for Turkish which we will be summarizing below.

Following Goh (1996), Denwood claims that words in Turkish conform to a single four position template (two non-branching onset-nucleus pairs)[90]. The interpretation of these positions is subject to language specific conditions, which for Turkish are proposed to be as the following:

(7)

(i) Domain final nuclei are always empty in Turkish

(ii) The parameter is fixed for domain final p-licensing

(iii) There is only one context where a domain-final empty nucleus must be interpreted in order to satisfy the requirements of minimal word: when O2 of the stem is empty. N2 of the suffix is never interpreted[91].

(Denwood 1998:182)

That is, for the stems either the last nucleus of the second ON pair is empty, which is made possible by the domain final p-licensing parameter switched to ON in Turkish, and its preceding onset is filled or, when the onset in the last ON pair is empty (this is the case in very restricted contexts), its nucleus must be interpreted. So, as far as the stem template is considered both members of the last ON pair cannot be silent at the same time, it is either O_2 or N_2 that can be silent, as stated above[92]. According to

[90] A template in phonology can be defined as following: "Generalized phonological patterns, such as CCVC, where ' C' stands for consonant and the 'V' stands for 'vowel'. In generative phonology, templates are appealed to in the analysis of Arabic and in the study of reduplication patterns." Carr (2008:174)

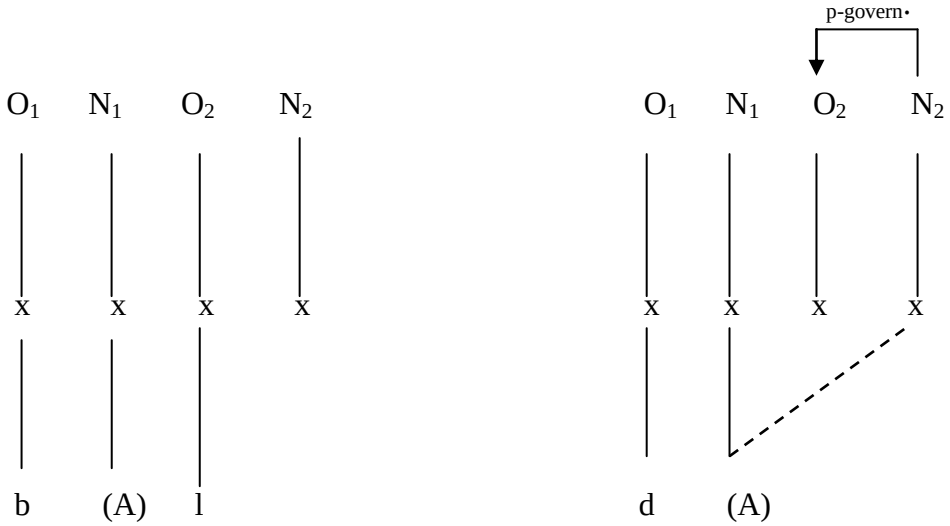
[91] "Suffix" for Denwood is any template that is not the first one.

[92] There is a small set of function and content words of CV- shape, in which the last ON pair seems to remain empty. As for the content words Denwood notes that there is one rare exception su [su] 'water', that historically contained a word final consonant, which can be traced through its cognates in the modern Turkic dialects either as [v] or in the form of a long vowel [u:]. Functional words of

these conditions, stems in Turkish can fit into the four –position template in two possible ways, depicted in (8) below:

(8)

(a) *bal [bal]* ‘honey’ (b) *dağ [da:]* ‘mountain’



Words of the (C)VC type such as *bal* have representations as in (8a), whilst stems like *dağ* are considered to be represented as in (8b). Denwood claims there are two types of template in Turkish, an independent template (stem template) and a dependent template (suffix template), which differ in terms of conditions of the interpretation of their final ON pair. For instance, as can be seen in the conditions given above (4-iii), while N_2 of the suffix can never be realized, it can well be interpreted in the stem templates. Also, stems longer than the ones given in (8a-b) are

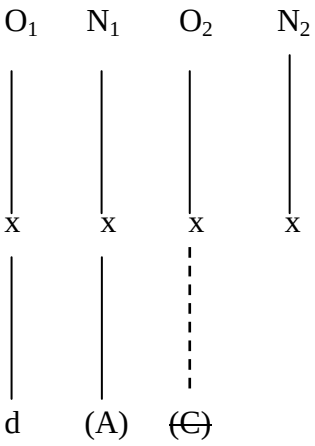
CV-type on the other hand, like [bu] ‘this’, şu [ʃu], ‘that’, o [o] ‘he/she/it’ are considered to be defective, hence exceptional cases.

suggested to occupy more than one template (in a word like kedi ‘a cat’ there are both suffix and stem template, $[[[ked]_{stem}\ i]_{suffix}]]$).[93]

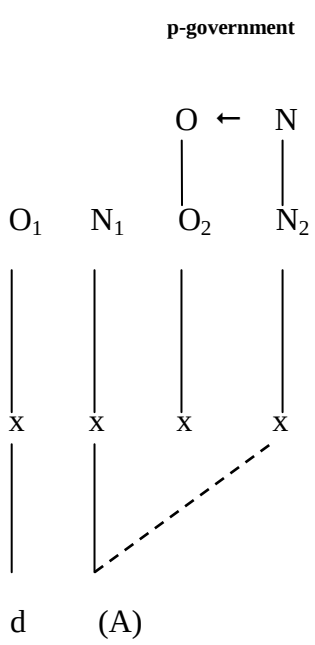
Coming back to *dağ [da:]* ‘mountain’ discussed by Denwood, we have already stated that the author assumes that the final vowel in this word is (historically) lengthened after lenition /deletion of a word final consonant, in order to satisfy template requirements. Let us further concentrate on this claim, going through the structures presented by Denwood (1998):

(9) A historical derivation of *dağ type* words

(a)



(b)



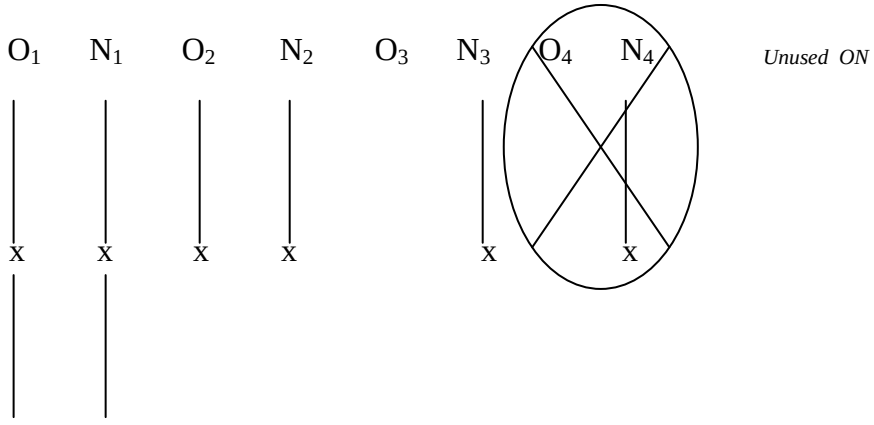
According to Denwood in (9a) both O_2 and N_2 of the stem are empty. The melody hosted by O_2 is claimed to have undergone lenition historically. N_2 remains silent through parametrical p-licensing. O_2 on the other hand cannot get any license to

[93] For further discussion and examples the reader is referred to Denwood (1998).

remain empty. In (9b) the melody hosted by N_1 is claimed to be interpreted in N_2, in order to provide O_2 with a proper governor. Hence O_2 can be p-licensed though proper government. Now the requirements on the template are satisfied and the structure is well-formed.

Regarding the structure of *dağ type* words depicted above, we claim that there is no need to refer to any template requirements in order to account for the representation of the vowel length, as the theoretical tools at hand (structural well-formedness conditions allowed by GP) are satisfactory enough to generate similar structures (9b). The details and the problems the derived structure such as (9b) calls forth, will be discussed in the 4.5 subsection of this chapter. Now let us look how Denwood accounts for the behavior of *dağ type* words whose structure is given in (9b), when we come to vowel initial suffixes. Consider the structure for third person singular possessive form of *dağ* given in (10) below:

(10) *dağı* *[daɯ]* ‘mountain-3 SG. POSS’



(Denwood 2002:95)

[94] The realization of empty melody is given as [ɯ] Denwood represents it with ‘ɨ’. The glosses, and the indication of (s) and O_4N_4 are mine.

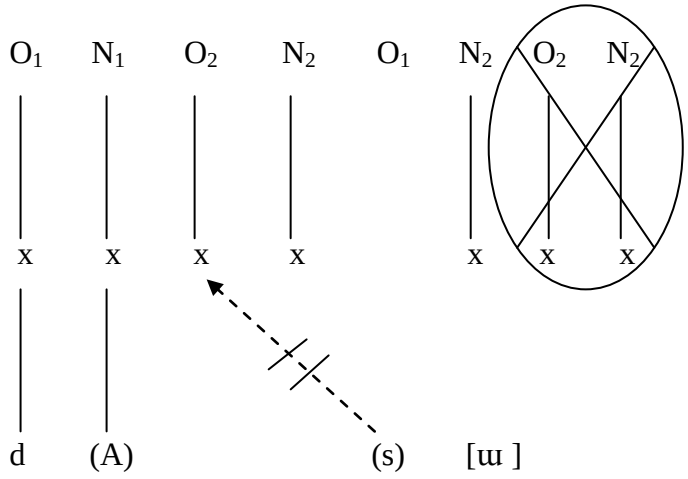
In (10) *dağ* is assumed to fit into the stem template, and the possessive suffix {-(s)I(n)} occupies the suffix template whose final ON pair is empty (unused) and therefore considered to be deleted from the structure. It has to be noted that the reduction of the empty slots from the structure only because they are unused is problematic in terms of arbitrariness and structure preservation which are the core concepts of GP.

According to Denwood, the vowel shortening (delinking of element A from the final nucleus of the stem) before vowel initial suffixes takes place to resolve a sequence of three consecutive interpreted nuclei in a row, which violates the Binarity Theorem.[95] The author claims that the reason why such a sequence is not resolved through the buffer consonant of the suffix (-s) in the O_3 of the suffix, lies in the special conditions proposed for the stem template. According to these, a buffer consonant (of certain suffixes) cannot attach to the final onset of the stem template but are only allowed to attach to the final empty onset of the suffix template, therefore we get *dağı* but not **dağsı,* as the third person singular possessive form of dağ. Consider the structures below in (11):

[95] Denwood noted that binarity , in the non-branching version of GP she adapts, "is understood to mean that no more than two adjacent nuclei may be interpreted." (Denwood 2002:97-98) Demircan (1979) also notes that , due to the fact that a long and short nuclei cannot be adjacent, a long vowel can not follow a short one so we observe vowel shortening in the contexts such as the following: *yağ [ya:]* 'butter' – *yağın [yaɯm]* 'butter –GEN.' but not **[ya: ɯm]*.

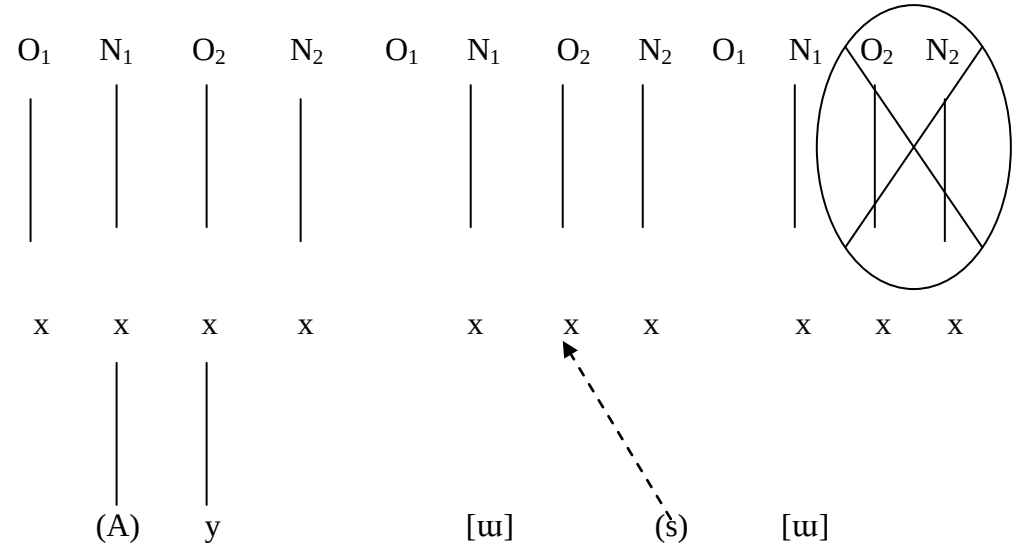
(11)

(a) *dağı* *[daɯ]* ‘mountain-3 SG.POSS’



In (11a) above the first two ON pairs which constitute a stem template are considered to be somehow special in not allowing the buffer consonant (floating segment) of the suffix template (s) to attach to the available empty onset position (O_2).

(c) *ayısı* *[ajɯsɯ]* ‘bear-3SG.POSS’



In (11b) above there are three four positional templates, the first one is the stem template and the other two are suffix templates. Recall Denwood's proposal regarding the conditions on the stem template, where either the nucleus or the onset of the last ON can be interpreted, but not both. According to this requirement one has to consider a Turkish word like *ayı [ajɯ]* ' bear' to occupy two templates (stem+suffix) as is represented above. Now as the final suffix template, which hosts the third person singular suffix, follows another suffix template Denwood assumes that the final onset of the former template can host the buffer consonant of the latter suffix template. Compare this structure to the one in (11a) where the final onset of the stem template cannot host (s) of the possessive suffix due to its 'special status'. Also note that Denwood's assumption would generate forms like *tebliğsi where according to Denwood the buffer of the possessive suffix will attach to the suffix template [[[teb_{stem}]li: $_{suffix}$]]si $_{suffix}$]]]. However this is not the case we have tebliği as the 3 SG. POSS form of tebliğ. So, should forms like *tebliğ [tebli:]* 'declaration' be treated differently or is there a basic problem with the Denwood's proposal regarding the vowel initial suffixation which make reference to the special status of the stem template?

To evaluate Denwood's suggestions regarding *dağ type* behavior in Government Phonology framework: First, regarding the vowel shortening to resolve *V:V in *dağ*, Denwood claims that three adjacent nuclei are not allowed to stay in row, which she claims is also disallowed by the Binarity Theorem of Standard GP. If we look at the representation in (10) we will see that there is an empty onset with a point intervening between N_1 and N_2 of the stem while there is an empty onset

without a point between N_2 and N_3. One may ask whether both types of onsets are identical in providing environment for the interpreted nuclei to see each other or in other words to be adjacent (In the rest of this thesis, our central claim is that an onset with a point prevents two nuclei from seeing each other, serving some kind of blocker role, in the very same manner a filled onset prevents two nuclei from being adjacent). In other words, how adjacency is understood by Denwood is not quite clear. Furthermore, there are a number of words in Turkish where in fact a V:V sequence is allowed e.g. nihai [niha:i] 'conclusive', bina:en [bina:en] 'by virtue of'. Following Denwood's logic one may wonder why the long vowels in those sequences are not shortened or what kind of consequences that has on Denwood's account.

Second, Denwood proposes that the buffer (-s) of the suffix is not interpreted in the possessive form of *dağ* due to the special status of the stem template, which prevents buffer consonants from being attached to the final onset of this template. This is like saying that it is because of the status of the stem template that (-s) behaves in such way and if one further asks why the stem has this special status well the answer for that question will most probably be that it is due to the fact that (-s) behaves in such way (does/ca not attach to the stem template), a circular argument in itself. All in all, Denwood's account of *dağ type* behavior seems to buy one a circular and descriptive argumentation, shaking the reliability of her analysis.

4.3 Summary of the Literature Review

We have given a short sketch of the (linear and non-linear) analyses proposed to account for the representation and behavior of *dağ type* words in Turkish. Besides the problems generated by the particular frameworks the researchers adapt in order to base their arguments, there are a number of arbitrary mechanisms regarding *dağ type* behavior, which we tried to list above. Also, it seems that the common characteristics of these analyses is that almost all of them view the final vowel length in *dağ type* words as being derived for some compensatory purposes (to compensate consonant loss, to fulfill template requirements etc.) and that they treated *dağ type* behavior as a phonological process (Lees 1961;Sezer 1986;Denwood 2002).

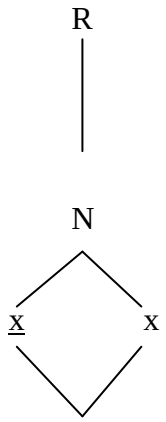
In what follows, looking through the eyes of Government Phonology we will suggest a possible structure for *dağ type* words which represents domain final lexical vowel length. Then we will compare the vowel length with other types of length in Turkish such as *bina* and *merak* type words. Finally, addressing *dağ type* behavior we will claim that given GP's restricted view on what kind of processes should be taken as phonological, *dağ type* behavior cannot be explained exploiting the tools of phonology.

4.4 Long vowels in GP: Options

Dağ type words have word final vowel length in their structure. Before discussing the representation of this length and how it is different from other types of vowel length attested in Turkish, let us see what possible structures GP allows for long vowels. Consider the structures in (12a-b) and (13a-b) below:

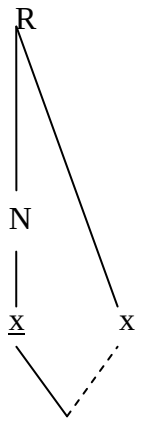
(12) branching structures

(a) Branching nucleus



α[96]

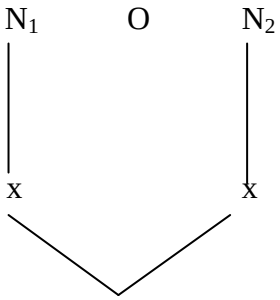
(b) Branching rhyme



α

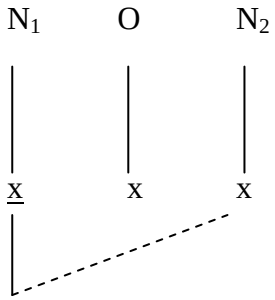
(13) non- branching structures

(a)



α

(b)



α[97]

[96] α corresponds to the melodic primes. Note also that the structure in (12b) can also be considered to be lexical (long).

[97] Directionality of spreading (lengthening) is subject to parametric variation , it is rightwards in our representation.

All of the four structures illustrated above in (12a-b) and (13a-b) are equally possible for representing a long vowel in GP. The difference between these structures lies in that while in (12a) and (12b) there is one melody shared between two skeletal points of one constituent (a nucleus and a rhyme respectively), (13a) and (13b) both have two nuclei each dominating one skeletal point and there is one (single) melody shared between these two points. Also in (9b) the rhyme makes the structure different from (12a), where we have a nucleus. But (13a) and (10b) seem to be are identical with the only difference that in (12a) there is an onset without a point while in (13b) there is an onset with a point flanked by the two nuclei.

In what follows we will show what kind of length the structures above represent, as it is given in the literature, and we will discuss the the type of structures different types of vowel length in Turkish are mapped onto.

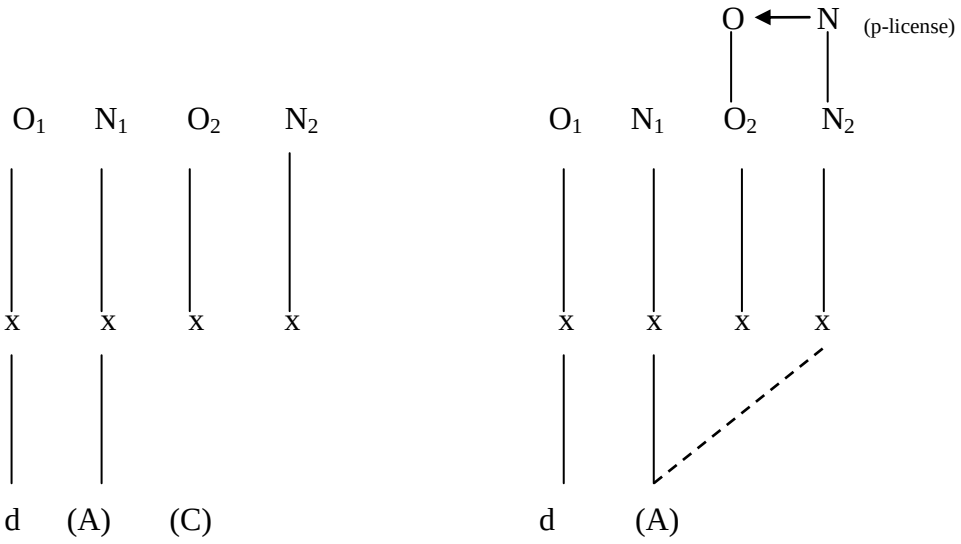
In GP literature, the lengthening in (12b) and (13b) is suggested to take place to satisfy structural or prosodic well-formedness conditions.[98] Consider the structures of *dağ [da:]* 'mountain' in Turkish and *blå [blɔ:]* 'blue' in Norwegian ,which are proposed to have derived, lengthened vowels, as depicted in (14a-b) and (15a-b) below.[99] The structures for *dağ* and *blå* are illustrated as they are given in (Denwood 1998:182) and Johnsen (ms.) respectively.

[98] The structure in (13b) can also represent lexical length (Yoshida 1993).

[99] Note that the structure in (14) is proposed by Denwood (1998) for *dağ type* words, in the course of the discussion we will put forward the problematic sides of this proposal and suggest the alternative.

(14)

(a) (b)



Denwood (1998:182) suggests that the final nucleus in forms like dağ [da:] is lengthened in order to satisfy the requirements on the minimal stem template (proposed for Turkish).[100] By spreading melody into the final nucleus we can provide

[100] Following Goh (1996), Denwood (1998) claims that words in Turkish conform to a single four position template (two non-branching onset-nucleus pairs). The interpretation of these positions is subject to language specific conditions, which for Turkish are proposed to be as follows (this is stated in 4.2.2.2 and repeated once more below):

(i) Domain final nuclei are always empty in Turkish

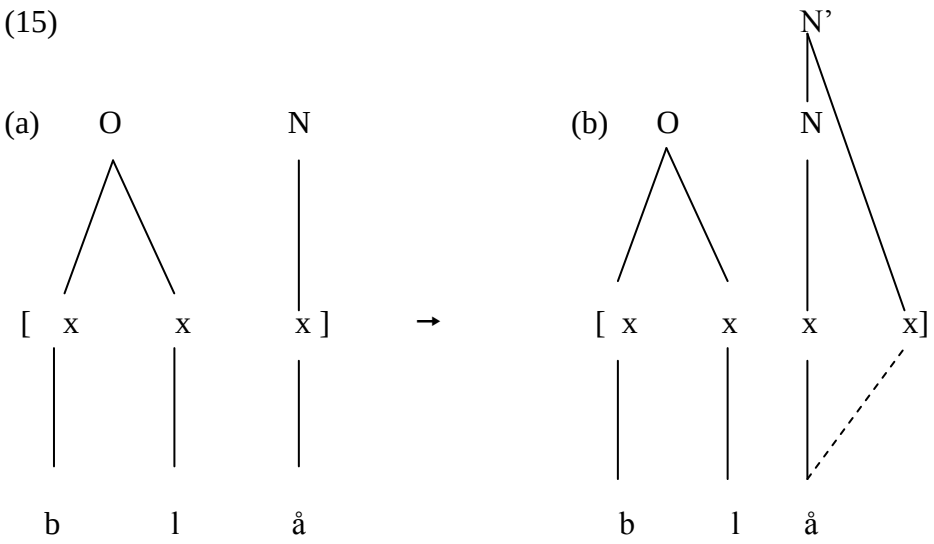
(ii) The parameter is fixed for domain final p-licensing

(iii) There is only one context where a domain-final empty nucleus must be interpreted in order to satisfy the requirements of minimal word: when O2 of the stem is empty. N2 of the suffix is never interpreted.

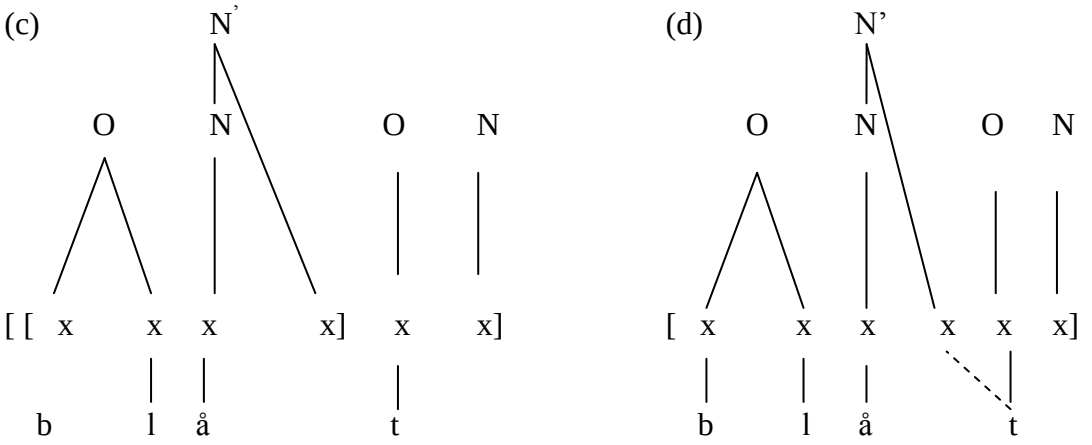
a proper governor for O_2 whose melody is assumed to be historically elided[101]. However if the melody did not spread and the final nucleus was uninterpreted, an empty onset with a point could not get license from its nuclear peer -only realized nuclei can be p-governors-.Hence, rendering the structure to be illicit. In short, the motivation for lengthening is claimed to be the (stem) template requirements of Turkish.

Let us now consider the structure of a branching rhyme (N' as it is given in the original text corresponds to R) posited to represent a derived long vowel. This is depicted in (15a-b) for Norwegian *blå* 'blue'.

(15)



[101] Here by lengthening we assume association of a melody α with an additional (nuclear) skeletal slot via spreading. Denwood defines this association as interpretation in the original text. At this stage we are not concerned with the type of spreading, this point will be discussed in detail later.



Johnsen (ms.) states that in Norwegian words, a stressed position must be heavy, and that can mean long vowel or a short vowel + coda i.e., á being any stressed vowel Cá:CV or CaCCV. In particular, vowel length in Norwegian is derived to satisfy rhythmic requirements and these stressed long vowels are shortened again in the environment of consonant initial suffixes (neuter and passive), whose consonants geminate.

The derivation of *blå* illustrated above exemplifies the relationship between (stressed) long vowels and geminate consonants in Norwegian. That is, a lengthened vowel shortens (disassociates from the branch of the rhyme) when a consonant initial suffix (neutral or passive) is attached to the stem triggering the gemination of the initial consonant of the suffix via its association to the rhymal complement position.

Johnsen assumes that the derivation proceeds in cycles[102]: (15a) is claimed to be the lexical representation of the adjective *blå* 'blue'. In the first cycle stress is assigned to the final nucleus of the domain , which being stress-assigned must branch

[102] Note that Johnsen's understanding of cycles is quite different from that of Kaye's (1995). According to Kaye, the operation applied in the inner cycle can not be undone in the outer cycle, which as can be seen above is not true for Johnsen.

(in Norwegian), therefore N is projected to N'(rhyme) . Also, the melody hosted by final nucleus is associated with the second branch of N'. This rhymal position (N') is associated with vowel length and is claimed to be "unstable" in the sense that it is reserved for non-nuclear material. This is depicted in (15c-d) where the final vowel of the stem shortens and initial onset of the neutral suffix "-t" following the right branch of the rhyme gets associated with this position, forming a geminate consonant[103]. Lars Johnsen's analysis of gemination in Norwegian is significant in that it is the first to introduce a branching rhyme structure (Johnsen Vowel) as a representation of metrically lengthened vowels. However the process of derivation he assumes for the neuter forms of adjectives is problematic in many aspects so that one wonders whether the branching rhyme structure ,with all its expenses, can be proposed to account for the gemination in Norwegian. Let us very briefly point out the problematic sides of Johnsen's analysis in its connection with a branching rhyme.

First, Johnsen assumes that branching rhyme is derived in the course of derivation, consider (15b) above. This is a violation of one of the core principles of GP, the Projection Principle which states that: "Governing relations are defined at the level of lexical representation and remain constant throughout a phonological derivation" (Kaye 1990:221;Kaye 1995:239). That is, any changes in the constituent structure—formed by governing relations at P_0— are excluded in GP. Apart from violating the Projection Principle the structure in (15b) also violates the Coda Licensing Principle which dictates that: "Post-nuclear rhymal positions must be licensed by a following onset" (Kaye 1990: 311). According to which domains can

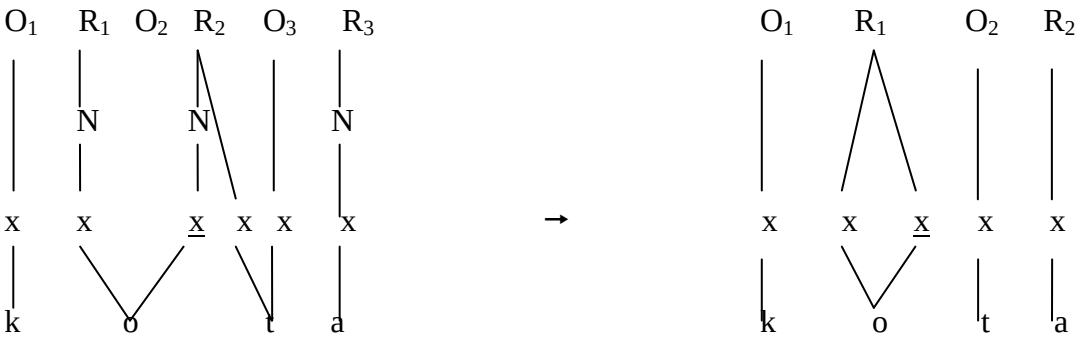
[103] See also (Kaye 1992:18). Also note that all the representations are given as they occur in their source references.

not end in rhymal complements but must be followed by onsets which come in pair with their nuclear peers (ON) as dictated by the structural requirements of GP.

It has been shown above in (14-15) how the lengthening process in the (derived) long vowels is motivated for non-branching (14a-b) and branching structures (15a-d). It has already been noted that the structures in (12a) and (13a) represent lexically long vowels. However, the difference between a single nucleus in (12a) and two nuclei in (13a) may be reflected in a tone/stress difference between two successive nuclei of the latter representation (here duration should be considered independently from stress /prominence of a vowel). For instance, Yoshida (1996) differentiates a branching structure from a non-branching one on the basis of tonal facts in Japanese, that is if there is a sequence of two vowels (VV) each may take a different tone on the other hand if there is only one vowel (V) as in (12a) there is only one tone. Consider the representations below :

(16) *kootta* 'was frozen'

(a) careful speech (b) less careful speech



[ko-otta] *[ko:ta]*[104]

[104] There is a consonant de-gemination process taking place in the casual speech version, which is not relevant to our discussion.

Yoshida states that a word like *kootta*, which means 'was frozen' in Japanese, has two variants: The first one is *[ko-otta]* where the initial vowel of the stem is long. This long vowel is mapped on the structure as a sequence of two nuclei, as a justification for such a structure Yoshida gives the Initial Lowering on the first rhyme.[105] That is, while R_1 is assigned a low tone, R_2 bears high tone, with different tones indicating separate nuclei. The second variant of *kootta* is *[ko:ta]* in which the long vowel is assigned one (single) tone, being an indication of one nucleus. Yoshida claims that (16b) is derived from (16a) via Nuclear Fusion of R_1 and R_2.[106]

We will not give further details and problems of this derivation as it is far beyond our focus of interest. The main point of the Japanese example was to illustrate that lexically non-branching nuclei (as a representation of long vowels), where there are two successive nuclei separated by an empty onset without a point, should not be considered in parallel with lexically branching nuclei.

So far we have illustrated the logically possible representations long vowels can be mapped on in GP. It has to be noted that whether a language X allows its long vowels to occupy branching or non-branching structure or one certain type of these structures is determined by the type of this language, accordingly determined on the basis of phonological phenomena observed in that certain language. For instance, languages like Vata, Palestinian Arabic and Quechua do not allow for

[105] Initial Lowering: a process that assigns a low tone an initial rhyme (Yoshida 1996:87).

[106] Nuclear fusion is problematic as it again violates one of the core principles of the theory: Projection Principle which states that "Governing relations are defined at the level of lexical representation and remain constant throughout a phonological derivation " (Kaye 1990:221). Instead of a structure altering process such as Nuclear Fusion, later on we will claim that it is either the presence or absence of an empty onset with a point which differentiates between the two structures above.

branching nuclei, however in others like Hungarian, Portuguese and German branching nuclei are well attested (Kaye 1990:324, Yoshida 1996: 18 for further details on syllable typology).

Turkish is interesting in that it does not allow for branching onsets. However, word finally it allows for consonant clusters some of which can be represented by coda-onset structures while others can form onset-to-onset governing domains. This has implications for word medial clusters which can also either be represented by coda-onset governing domains or by onset-to-onset government. To resolve such indeterminacy, non-branching accounts of Turkish were claimed to capture the facts more accurately (Denwood 1998/2002; Charette 2008; İskender 2009 among others).

One of the main aims of this thesis is to investigate the nuclear structure of the *dağ type* words and how it is different from other types of length attested in Turkish. In terms of the nuclear structure we do not assume a branching or non – branching structure as a representation of long vowels a priori but we would rather go through all the possible variants and induce the most appropriate representation. We will also compare the (final) representation of *dağ type* words with the representation(s) we assume for other types of length –*merak type* and *bina type*—in Turkish.

4.5 Dağ type Words: Lengthened or Already Long?

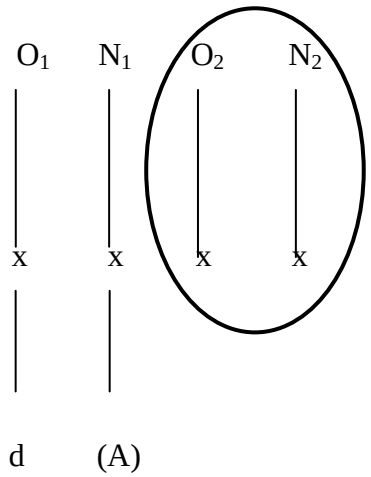
4.5.1 First Assumption: A non –branching derived structure

One way to represent *dağ type* words is to assume that they start their life as two ON pairs. The first ON pair contains a lexically assigned melody while the remaining one

is not associated with any melody and is sent to phonology as such. This structure we will call derived as the lengthening is assumed to take place in phonology, it is depicted below in (17):

(17) *dağ* (Preliminary)

Lexical structure as it is sent to phonology

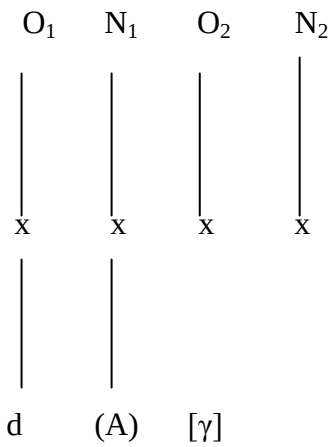


The representation above in (17) contains two empty positions O_2-N_2 and there are two logical options for this form to be realized, which is subject to parametric choice. That is, either O_2 is realized and N_2 is parametrically p-licensed or N_2 is realized acting as a proper governor for O_2 which now can be p-licensed, hence stay silent. Standard Turkish opts for the second option while some dialects of Turkish can be considered to prefer the first option. The two options are depicted below:

(18)

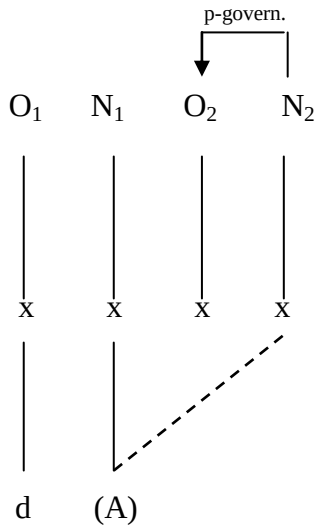
(a) Option 1: Dialects

[daγ]



(b) Option 2 : Standard Turkish

[da:]



In (18a) O_2 is realized as a velar fricative (it is the interpretation of an empty onset) and N_2 is parametrically p-licensed. In (18b) on the other hand N_2 is realized by its association of the melody attached to N_1 and being interpreted now it serves as a p-governor for O_2, in other words O_2 is given license by N_2 to stay silent.[107] However, one may wonder what kind of association process (obtained through spreading) we are dealing with in (18b) above, provided that the term "spreading" can be understood in a number of ways in GP. It is either:

[107] There are a number of dialects (in Eastern Anatolia) which have forms like dag, ending in a velar plosive, for such forms we should say that their melody is lexically set in the same manner as the word final melody in the words like *kan [kan]* 'blood'.

(19)

(i) "An operation whereby some melodic property that in the beginning was only present in position x ends up being present in position x as well as in position y,

or

(ii) A matter of interpretation only: 'Spreading' from x to y really only means that y receives the same interpretation as x. There is no implication that a particular element is present in both positions." Pöchtrager (2009:9)[108].

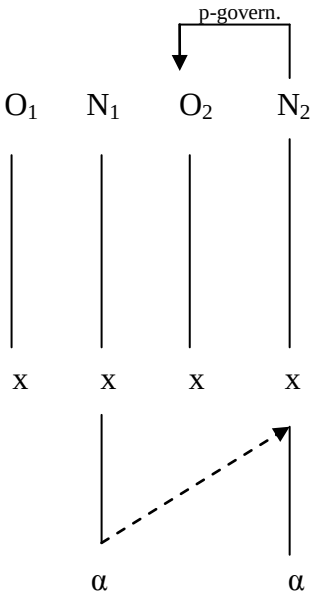
Regarding the view (i) of spreading, it requires the source melody to be always present at the beginning while the target of spreading may or may not be empty. The classical version of this view (which was popular in 1980's) assumed that both the source (N_1 in the structures below) and the target position should be filled as a result of spreading (20a). While yet another interpretation of (i) view (Charette 2007) assumes the source melody to be present at the beginning but the target melody to be empty . That is the melody of the source position is only interpreted in the target while this position does not host a melody itself (20b).[109]

[108] The reader is also referred to Charette (2007) and Denwood (2002) for further discussion on spreading as interpretation (slightly different accounts) .

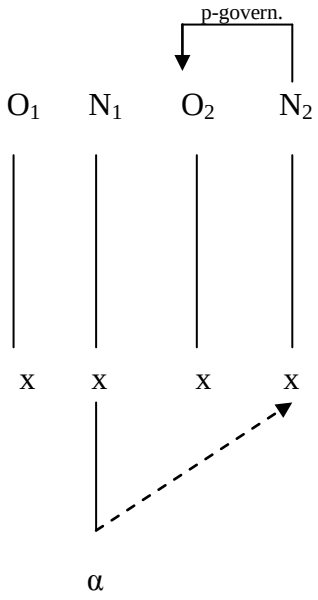
[109] The dotted line indicates interpretation of the melody hosted by N_1 in N_2. α corresponds to some element.

(20)

(a) Classical view- N_2 is filled

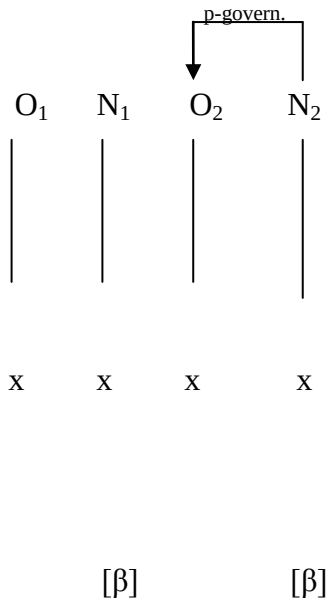


(b) Charette (2007)- N_2 is empty



Coming back to (ii), here the spreading from one position (N_1) to another (N_2) is assumed to be only as an interpretation where both source and the target positions may be empty. In this case there assumed to be a licensing relation between the source and the target whereby the target licenses the source to be realized. In (21) below, where [β] corresponds to some melodic prime, both N_1 and N_2 are empty positions which are interpreted by the realization of [β]. The assumption is that N_1 is the source position (e.g., harmonic head) which licenses the recessive position (N_2) in the structure to be interpreted.

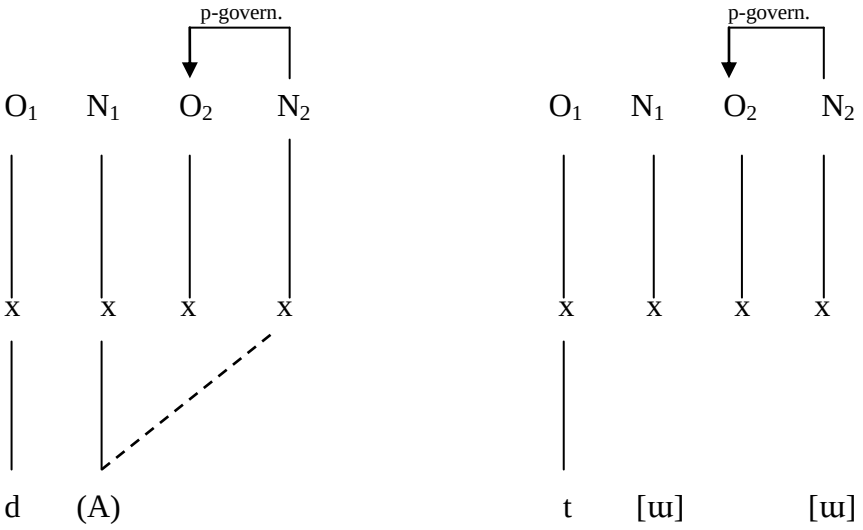
(21)



Having described the three views of spreading above and given that there are *dağ type* words, which have empty melody realized as [ɯ] in their representation, we claim that the (ii) of spreading is better to adhere in order to account for the realization of melody in the final nuclei assumed to take place is these forms (Note that we are still dealing with the non-branching derived structure validity of which will be discussed and rejected below). Consider the representations of the *dağ [da:]* ‘ mountain’ and *tığ [tɯ:]* ‘ crochet hook’ illustrated in (22) below:

(22)

(a) *daǧ* *[da:]* (b) *tıǧ* *[tɯ:]*

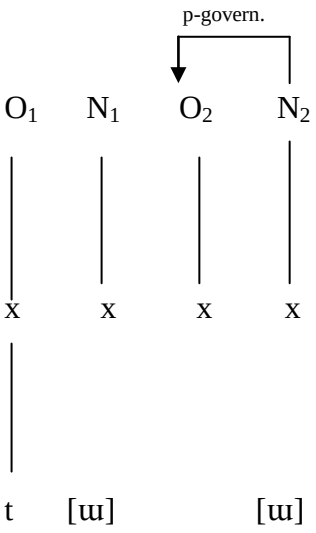


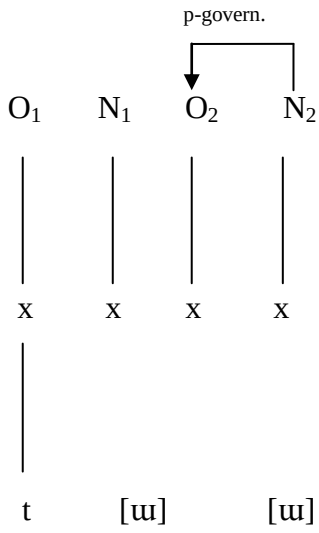
If we are to believe in (i) which assumes that the source nucleus (N_1 in the structures above) must always be filled while the target may or may not be empty, we will be able to account for the structure such as in (22a) where N_1 is filled with element A. However we will miss the structure in (22b) where N_1 does not dominate a melody. On the basis of these , adapting (ii) view of spreading which captures both the forms which do and do not have a full melody hosted by their source nuclei, seems to be more inclusive. Therefore, both in this chapter and in the rest of this study we will adhere to the (ii) view of spreading.

After having introduced the type of spreading we will follow in the text, now we can turn back to the non-branching derived structure proposed for *daǧ type* words and question its soundness. Compare nominative and accusative forms of tıǧ [tɯ:] depicted in (23) below:

(23) *tığ* *[tɯ́ː]* ‘ a chochet hook’

(a) [tɯ́ː] ‘ a chochet hook’ (b) [tɯ-ɯ́] ‘a chochet hook-ACC.’





The structures in (23a-b) seem to be identical. However in terms of pronunciation the one on the right (23b) is pronounced with two vowels the latter of which is more prominent. While in (23a) there is one (single) long vowel heard and pronounced. Given such a difference in pronunciation, one may wonder the reason why two identical structures should have different mappings in the signal. At this point we may say that it is one of the weaknesses of the derived structure at hand which does not give us any cue(s) to identify the forms such as in (23a-b).[110] Further problems related with this particular structure will be discussed below, as a conclusion of which we will reject the non-branching derived structure.

[110] An alternative proposal based on the presence of an onset point in the structure will be given in sec. 4.5.4 of this Chapter.

4.5.1.1 Further Problems with the derived length view: Domain final high vowels

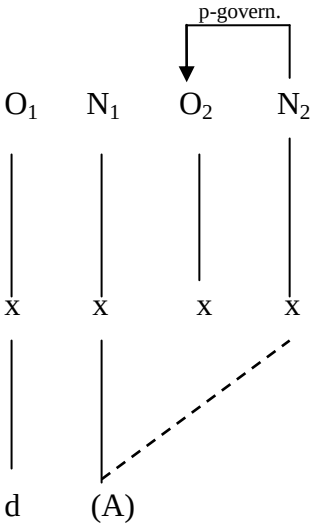
The most intriguing question the derived structure proposed above triggers is why domain final nuclei have to be materialized through spreading/interpretation. In the discussion we have been leading so far it was clearly stated that due to the fact that O_2 (the empty onset) of these stems requires a license to stay in the structure N_2 is realized (through interpretation) in order to serve as a proper governor for this onset.

However if we follow this logic, we should adhere to a more general view such that: "A parametrically p-licensed domain final empty nuclei can only be interpreted when they have to serve as a proper governor for their (empty) peer onsets." According to this proposition, we will never expect to encounter forms like *cadı [dʒadɯ]* 'witch', *kedi [kedi]* 'cat', *kutu [kutu]* 'box' *, ütü [ʏtʏ]* ' iron' where both domain final nuclei and their peer onsets are realized.[111] However such forms are quite common in Turkish. Therefore we are forced to say that the non-branching derived structure proposed for *dağ type* words has to be re-considered.

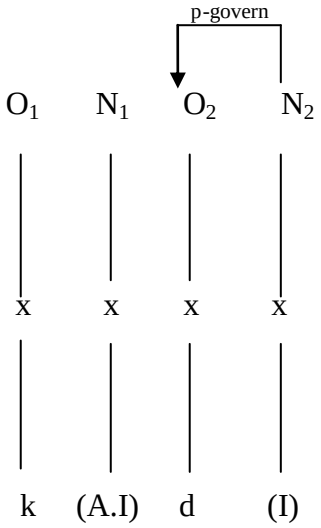
[111] Note that this is a problem Denwood's (2002) template proposal, regarding the interpretation of domain final empty nucleus in *dağ type* words, generates.

(24)

(a) *dağ* *'mountain'*



(b) *kedi* *'cat'*



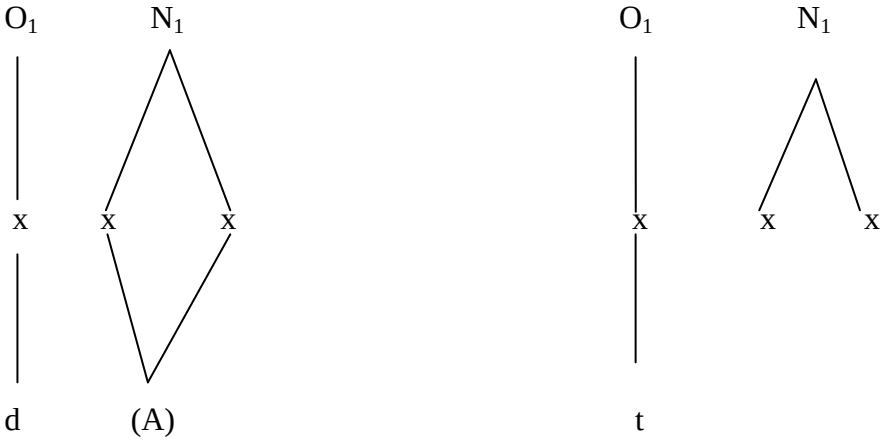
At this point we still assume that domain final p-licensing in ON in Turkish. Given this assumption in (24a) domain final empty nucleus which should be empty according to domain final p-licensed is interpreted as it has a role to undergo, namely to p-govern its onset peer which is an empty onset with a point. So, if a domain final empty nucleus which has to stay silent gets interpreted due to the fact that it has p-governor role to undergo, it can be assumed that whenever there is a domain final nucleus (the melody of which is not lexical but rather is determined by vowel harmony-high vowels in Turkish) it is interpreted to p-govern its onset peer. However as can be seen in the representation of *kedi* (24) both N_2, which is a domain final nucleus, and O_2 are realized, which means that consequences implied by (24a) that is every realized domain final nucleus must have its empty onset peer.

4.5.2 Alternative Story I : A Branching Nucleus

Having set out the problems with the derived structure of *dağ type* words, we assume that another possibility can be to represent word final vowel length in these words by a branching nucleus structure. Consider the representations in (25a-b) below:

(25)

(a) *dağ [da:]* (b) *tığ [tɯ:]*



In particular, a word like *dağ [da:]* can be represented as (25a) and *tığ [tɯ:]* may have the representation in (25b) with a word final branching nucleus.[112] However, in terms of domainhood the structures in (25a-b) is considered to be too small to be a

[112] Pöchtrager (p.c) states that English words such as sir [sər] have a branching empty nucleus in their structure. However, in earlier accounts Ploch (1998:216) notes that there is no evidence for branching empty nucleus in any language.

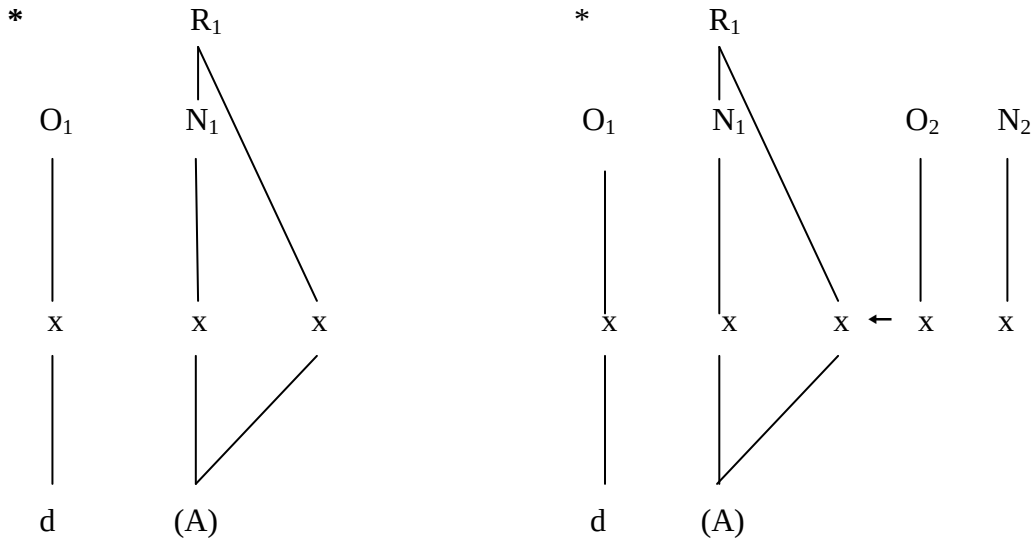
domain in Turkish, where we assume that the smallest domain has to occupy at least two ON pairs.[113]

4.5.3 Alternative Story II: A Branching Rhyme

We have already given a number of reasons for *dağ type* words not to occupy a derived non-branching and branching (nuclear) structure to represent its word final length. Yet another option to represent word final length in these forms is the branching rhyme (Johnsen Vowel) given in (26) below:

(26) *dağ* *[da:]* 'a mountain'

(a) (b)



One of the most striking properties of the structures above (26a) is the absence of the onset position (and accordingly its peer nucleus) following a branch of the rhyme which is required by the Coda Licensing Principle of GP. One may only theorize

[113] The function words like *bu* 'this', *şu* 'that', *o* 'it', *ne* 'what' which cannot stay on their own, are considered to be integrated into larger domains and content words such as *su* 'water', *ye-* 'to eat', *de-* 'to say' seem to be the only words to occupy single ON pair. They can be considered as "mere" exceptions (see Denwood 1998 for discussion).

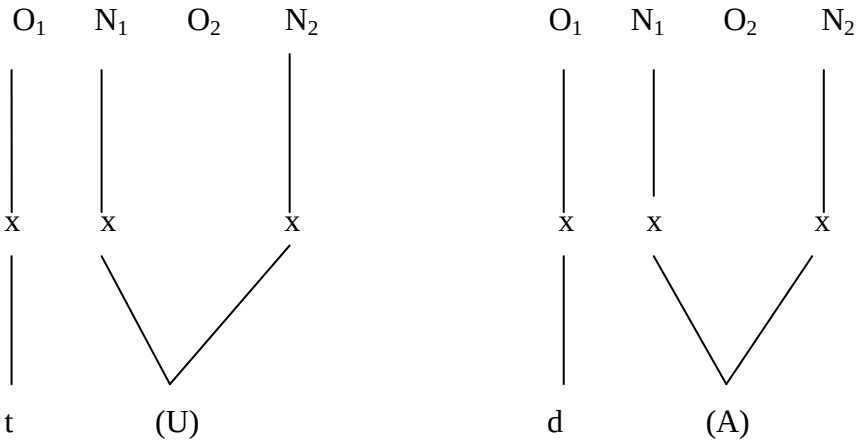
saying that may be there is an empty onset- nucleus pair following the N_1, however such a view will be hard to test, and therefore it is somehow dangerous to follow.

4.5.4 Final Solution: Non-branching + lexically Long

Having given the problematic sides of derived non-branching and branching structures, we assume that the most plausible stand to resolve the representational puzzle of *dağ type* words would be to consider them to have a non-branching structure and lexically assigned vowel length word finally. These structures are illustrated below:

(27) The structure of *dağ type* (Preliminary)

(a) *[tu:]* (b) *[da:]*



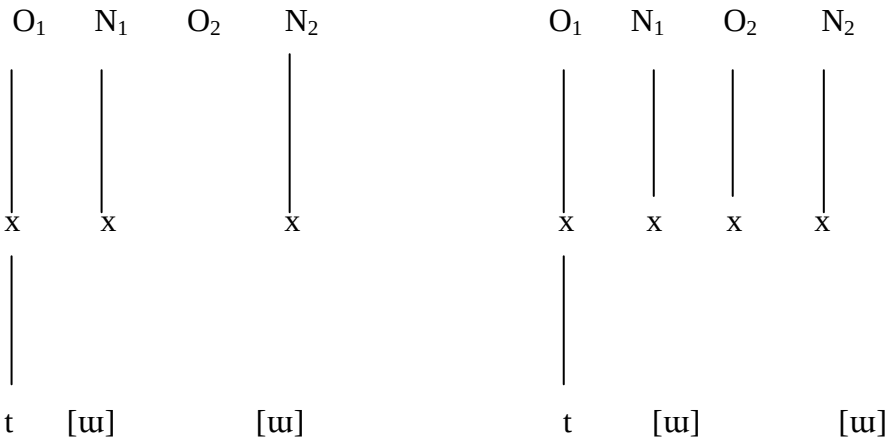
In the structures above (27a-b) we note that: (i) The onset preceding the domain final nucleus is an onset without a point (ii) One (single) melody is lexically shared between N_1 and N_2. In fact, this can be compared to the branching nuclei where both the structure (as in 27a-b) and a branching one contain one melody lexically shared between two skeletal points .

By subscribing to such a view we immediately escape the problem of p-licensing of an onset with a point (O_2) which requires the interpretation of the final nucleus, in order to p-govern the immediately preceding onset with a point, the claim leading to wrong predictions regarding the word final high vowels, as has been mentioned earlier.

As can be seen from the representation in (27) there is an empty onset without a point flanked by N_1 and N_2. Now let us see what kind of effect the absence of an onset point in the structure has in the nominative and accusative forms of tığ, where we have an interpreted empty nuclei realized as [ɯ] in Turkish:

(28) O versus Ox in the representation

(a) *[tɯː]* *(b) [tɯ-ɯ́]*



As can be observed in the structures above the only difference between the nominative and accusative forms of *tığ* in (28a-b) respectively can now be deduced from the structure. That is, the absence of an onset point in the former represents a single (long) vowel, whilst in the latter the presence of an onset point

serves as an indicator of two distinct vowels where the latter is stressed. So there seems to be some kind of relationship between the distribution of empty onset point and stress assignment, which can be directly inferred from the structure. This point will be elaborated on further in the following Chapter.

So far we have claimed that the *dağ type* words have to conform to the representations given in (27a-b). However in the forms where a vowel (nucleus) immediately preceding <ğ> in orthography contains an element I it has been claimed that there are two variants optionally manifested either as a vowel length or as a palatal glide [j], such as in *eğ [e:]/[ej]* 'to bend'. This optionality we will call I-dichotomy. In what follows we will give the representation of the two variants and present the consequences of our reasoning.

4.6 Further Extensions: Değ type words

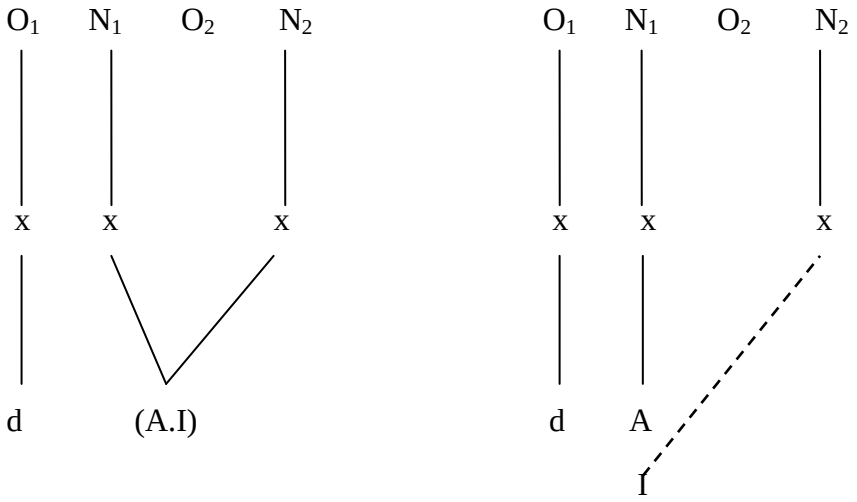
4.6.1 I – Dichotomy : Optional Lengthening or A Palatal Glide

In the GP literature not much is said on optionality in phonology. One possible way for optional forms to be dealt with in this framework is to consider them to be two different entities (lexical items).Considering forms like *değ [de:]* 'to touch', *çiğ [tʃi:]* 'raw' which have an element I in their initial nuclei and are claimed to have two optional pronunciations, we would say that these optional variants do have two different representations in the speakers' lexicon. The first form would be similar to those which we have proposed for the *dağ type* words in general, represented in (29a) below. That is, there is a single melody linked both to N_1 and N_2 lexically. In (29b), we assume that the structure starts its life as two onset nucleus pairs and the element

I present in the first nucleus spreads to the most local (available) position which is the final nucleus (N_2).

(29) *değ* *[de]/ [dej]* 'to touch'

(a) Option # 1: *[de:]* (b) Option # 2: *[dej]*



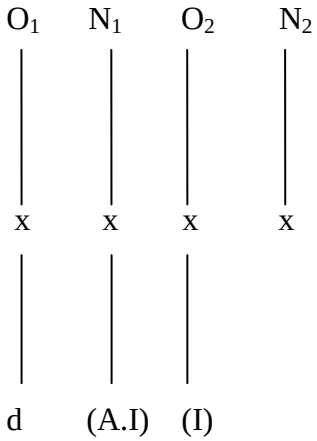
Two structures in (29a-b) resemble each other the only difference being that in the former, the melody (A.I) is lexically shared between N_1 and N_2 while in the latter the final [j] which is a semi-vowel is interpreted via I spreading from N_1. The similarity in their structure suggests that these two forms are related structurally (and most probably lexically). We propose the representations in (29a-b) for words like *değ* however there are further possibilities. Below we will present these options listing the problems they generate , which will strengthen our position in accepting the representations in (29).

We will call *dağ type* words which contain the element I in their first nuclei and have optional variants *değ type* words. Two types of possible structures can be

further proposed for the optional variants of *değ type* words. These possibilities and the problems with them will be discussed below.

(30)

(a) second variant: second possibility



We assume that another options in *değ type* words has the tructure depicted above in (30a). In (30a) it is assumed that O_2 is lexically associated with the melody (I) and is realized as [j]. It seems that (30a) is lexicalized in the same manner as for example *kan* 'blood' is, in terms of its melodic association. However, if we are to admit that the structure in (30a) as a second option to *değ type* words, we won't be able to account for the occurrence of (I) in the onset position of these forms any time the preceding nucleus has an element I in its composition. Such a co-occurrence should then be a matter of coincidence which is obviously not the case. Any time there is an element I in N_1 it is claimed to be followed by a palatal glide, and such a clear pattern should not be considered coincidental.

It seems that the less problematic stand for the optional variant of *değ type* words will be to prefer the structure in (29b). In Chapter 5, we will claim that besides the optional variants of *değ type* words which confirm to the structures in 29 (a-b), there are also a number of derived (optional) variants where the quick-speech phonology and the constraints it dictates for the empty onset without a point are at work in the phonological derivation.

4.7 Other Types of Length in Turkish: Bina Type and Merak Type

We have discussed the representation of length in of *dağ type* words (and a subset of this group *değ type* words) above. However, vowel length in *dağ type* words is not the only type of length we find in Turkish. Below, we will compare the structure of *dağ type* length with the other types of length attested in Turkish, in order to show that each type behaves differently from the other, the fact which requires them to have different structures which we will claim are all lexical.

Based on their behavior, we assume that there are two (other) types of vowel length in Turkish[114]. These are: i) *bina* type length in words such as *bina [bina:]* ' a building', *eda [eda:]* 'affectation', *rüya [ryja:]* ' dream' which have a long final vowel in their representation that is always long. [115] By " is always long" it is meant that long vowels in these words do not alternate. ii) In the second group we

[114] There are a number of other ways to lengthen vowels in Turkish (emphasis etc.) these are mostly phonetic issues and far beyond the scope of our discussion. The reader is referred to (Akçataş 2007:1-21) for a detailed discussion of vowel length in Turkish.

[115] We are aware of the fact that bina can be pronounced either with long or short vowel in the final position. (A point brought to my attention by Ann Denwood). In this thesis we base our assumptions on our own and our informants' dialect according to which *bina* is pronounced with a final long *[bina:]*.

include *merak type* length like in *merak [meɾak]* 'curiosity' , *zaman [zaman]* 'time', *hal [hal̪]* 'attitude' whose vowel length only shows up when they are followed by a vowel initial suffix e.g. *merakı [meɾaːkɯ], zamanı [zamaːnɯ], hali [haːli]*.[116]

In what follows we will briefly mention these (other types) of length in Turkish and, we will propose the (possible) structure(s) to represent them.

4.7.1 Merak Type : Branching nuclei or Johnsen Vowel

In a number of words in Turkish which end in a consonant and have "a", "u" or "i" in their final syllable, these vowels alternate with their long counterparts when either a vowel initial suffix or an auxiliary (et- 'do', ol- 'be') is added. This phenomenon has also been known as Closed Syllable Shortening , where an underlying long vowel is shortened in closed syllable, either word finally or when a consonant initial suffix is attached. (Lees 1961:39; Göksel and Kerslake 2005:19; Scheer 2004:253).[117] Consider the examples below:

[116] We will refer to words where a long vowel behaves like that of *bina, merak* and *dağ*, as *bina type* words, *merak type* words and *dağ type* words respectively.

[117] The non-linear analyses of the phenomenon will not be discussed here .The reader is recommended to refer to (Lees 1961:39) for the rule based formulation of the length alternation process.

(31)

Noun nom	Gloss	ACC.	N+AUX	ABL.
merak	‘curiosity ’	*mer[a:]k-ı*	*mer[a:]k et-*	*merak-tan*
hukuk	‘ law ’	*huk[u:]k-u*	-	*hukuk-tan*
tahsil	‘ education’	*tahs[i:]l-i*	*tahs[i:]l al-*	*tahsil-den*

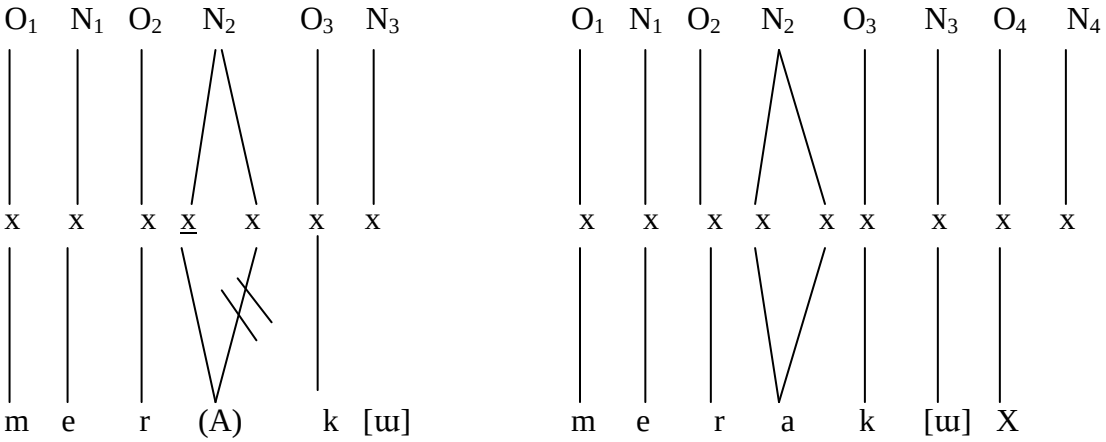
The length alternation in the forms above have long been of interest of GP’ists, starting with Kaye (1990).[118] Below first we will briefly discuss what kind of structure(s) have been proposed for *merak type* words indicating the problems with those accounts. Then we will suggest an alternative structure as a representation of *merak type* words.

Kaye proposed a branching structure to represent lexically long vowels in *merak type* words. According to Kaye, the shortening of a long vowel (disassociation of a melody from one of the branches of the nucleus) takes place before a p-licensed empty nucleus. Consider the structures below in (32):

[118] Note that Kaye (1990) has destroyed the notion of *Closed Syllable Shortening* with *merak* example from Turkish.

(32)

(a) *merak [merak]* ‘curiosity’ (b)merakı [mera:kɯ] ‘curiosity-3SG.POSS.’[119]



Kaye (1990) assumes that *merak* has the structure in (32a) where shortening of a lexically long vowel takes place before a domain final empty nucleus (disassociation lines , the numbering of the constituents and [ɯ]’s are mine). On the other hand in (32b) when a vowel initial suffix of ON-type (O_4N_4) is attached to the stem, the vowel length does not alternate. Kaye’s statement of the phenomenon is far from being explanatorily adequate, he points out to the connection between the domain final empty nucleus and the vowel shortening however the reasons for this shortening to take place in this particular context has not been articulated.

Later on Yoshida (1993), in his account of Palestinian Arabic (P.A.) vowel harmony, adapts Charette’s (1991) notion of government licensing to account for the

[119] X indicates some mysterious consonant in the pronominal stems which is not realized phonetically. The values given for in Kaye (1990) are old-fashioned so the reader is referred to the original text for further information, our main concern here was to provide the representation of long vowels in *merak type* words as it was given in the earlier accounts. We adapt the representations.

absence of (lexically) long vowels (represented by a melody shared between two N slots) before licensed empty nuclei. Below first we introduce the notion of Government Licensing, second we explain how it is adapted by Yoshida (1993) to account for length alternation, third we present how Kaye (1995) adapted Yoshida's proposal to branching nuclei in Yawelmani and lastly we show how Yoshida's proposal can be implemented to Turkish *merak type* length and we discuss the problems this structure generates.

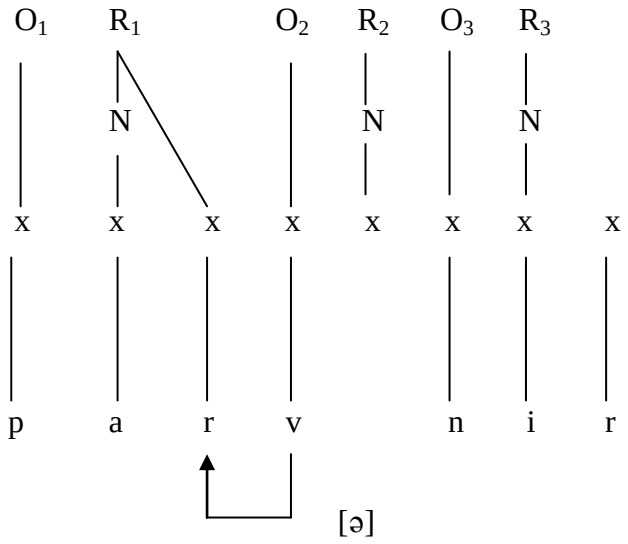
Charette (1991) in investigating the distribution of empty nuclei in French, had observed that empty nuclei (subject to p-government otherwise) are manifested as schwa [ə] following consonant clusters of coda onset or branching onset type. The author claimed that non-nuclear governors need a license to govern their complements which can only be provided by immediately following materialized nuclei. Based on these facts, Charette proposed the following constraint on government:

(33) Government Licensing Principle

"For a governing relation to hold between a non-nuclear head α and its complement β, α must be government licensed by its nucleus" (Charette 1991: 101).

Consider the representation of a French verb *parvenir* [parvənir] 'to reach' in (34) below:

(34) *parvenir*[120] *[parvənir]* 'to reach'



[parvənir] *[parvnir]

(Charette 1991:101)

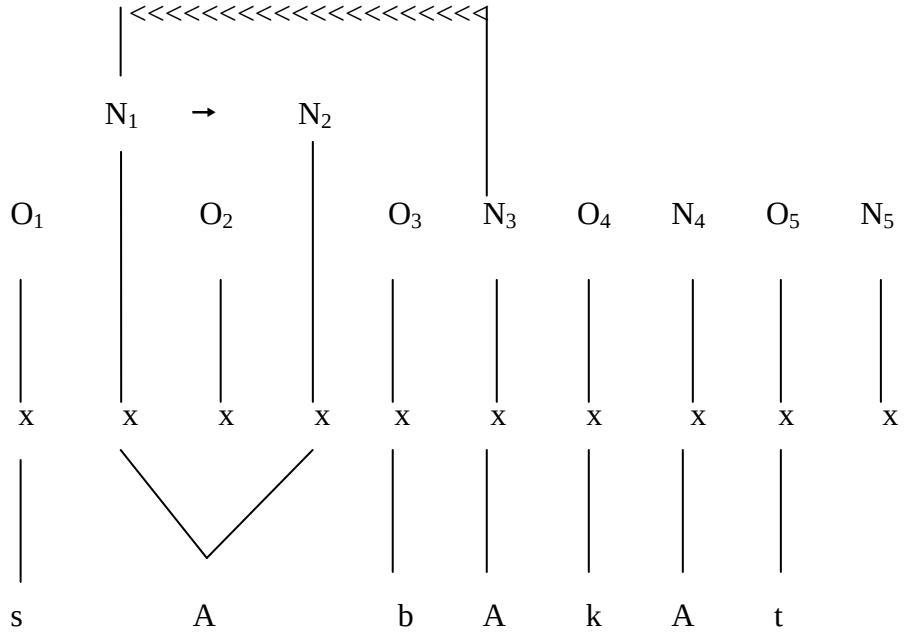
In (34) above there is an interconstituent governing domain formed between the second onset and the rhymal complement of the initial rhyme (cf. Coda Licensing Principle as well). According to the Government Licensing Principle, the head of this right-headed governing domain (O_2) has to be given license in order to govern its complement, by its nuclear peer. In French the government licensors (nuclei) must be the interpreted nuclei, hence R_2 is interpreted which is an empty position and otherwise is subject to p-licensing by the following realized nucleus. Consider the grammatical and ungrammatical forms of *parvenir* given above. Where in the latter, the sequence [rv] not followed by a realized nucleus is ruled out being ungrammatical. Charette notes that the status of government licensors (as being

[120] The numbering and [ə] are mine.

empty or realized) differs across languages(see Charette 1991:102-118 for a detailed discussion).

Having given a brief sketch of the Government Licensing as it is presented in Charette (1991), now it is time to show how Yoshida (1993) adapted this notion in accounting for alternating vowel length in Palestinian Arabic. Consider the structure illustrated below:

(35) saabakat [saabakat]/ *[sabkat] 'raced'[121]



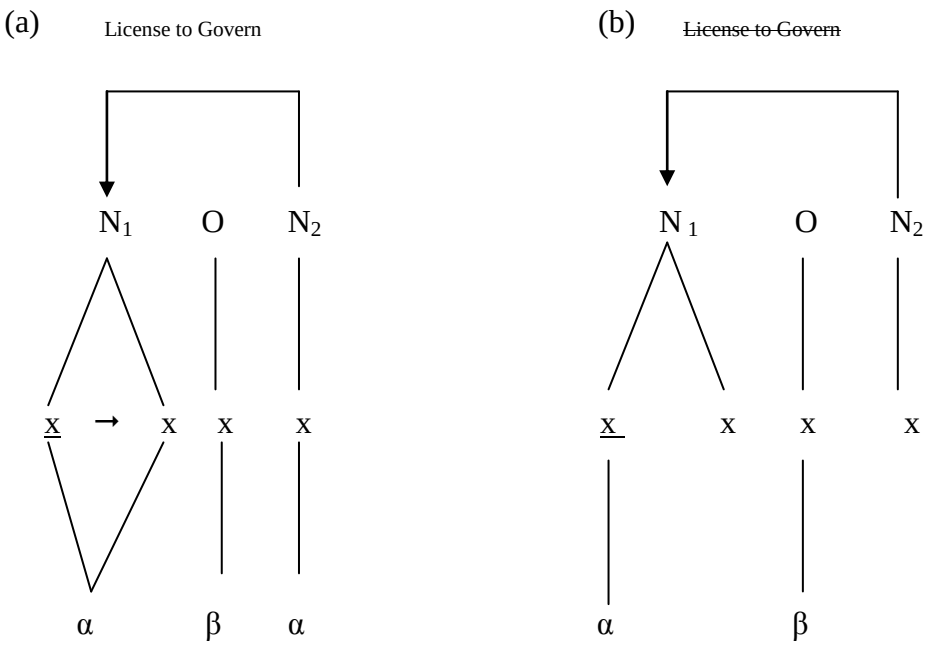
Yoshida states that for N_1 to share its melody with N_2, N_1 has to be given license by N_3 which is a full nucleus, otherwise (if there is no overt licensor to give N_1 license to govern its complement) we would get an ill-formed structure *[sabkat]. Yoshida also notes that any nuclear head in P.A. must be licensed to govern its complement. Government licensors in P.A. can be word final empty nuclei while domain medially

[121] See Yoshida (1993:152) for the representation. We have to add that *saabkat would also be an ungrammatical form.

government licensors must be full nuclei. Moreover, the author also puts forward that word final long vowels are not attested in this language which Yoshida takes as an evidence for his claim that any long vowel must have an immediately following government licensor either empty or full, depending on its position in the word.

Kaye (1995) implemented Yoshida's adapted version of government-licensing to account for Closed Syllable Shortening phenomenon in Yawelmani branching nuclei, claiming that the head of the branching nucleus has to be government-licensed in order to govern its complement. The logic of the licensing to govern mechanism in branching nuclei, is depicted below in (36):

(36)

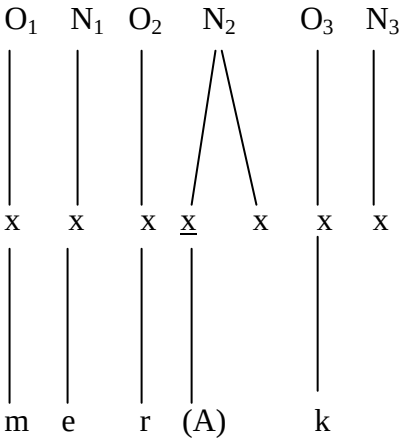


In (36a) the head of N_1, underlined, is given license by N_2 to govern its complement. In (36b) on the other hand, N_1 is followed by an empty nucleus which is not able to be a government-licensor, hence the head of N_1 is not given a license to govern its

complement, therefore its melody cannot be shared with its complement. One may wonder whether the skeletal point also is deleted with the melody. We would say that the skeletal point of the complement of the branching nucleus is preserved according to the Projection Principle which requires the governing relations (the constituent government in 36a to be formed at the level of lexical representation) and stay unchanged throughout the phonological derivation. Following the logic above one may assume that *merak type* words have a branching nucleus in their structure as an indicator of length, whose representations would be illustrated as in (37a-b) below:

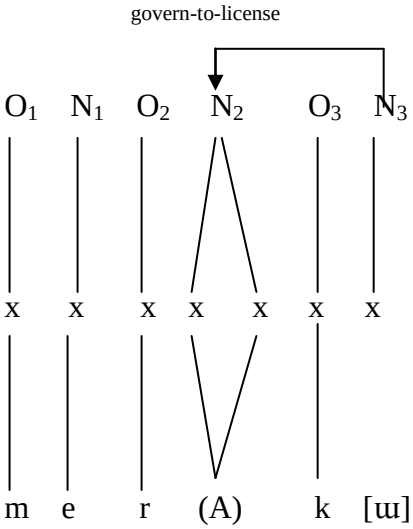
(37)

(a) *merak* *[meɾak]* 'curiosity'



In (37a) above the head of N_2 is not licensed to govern its complement (to license a melody), as the rightmost nucleus is parametrically p-licensed, hence not able to be a government-licensor.

(b) *merakı* *[meɾa:kɯ]* ‘curiosity – 3 SG. POSS.’



In (37b) N_2 gets license to govern its complement from the rightmost nucleus, hence the realization of the long vowel. Here, we give the resulting structure—the structure we get after suffixation— the details on which will be given in Chapter 6.

So far, we have shown that the length alternation in *merak type* words can be triggered by the lack of a government licensor to give license to the head of the branching nucleus to govern its complement. However, Yoshida’s “government licensing” account for length alternation in branching nuclei in Turkish (as well as in general) can be seen as problematic.

Charette (1991) proposes that a government-licensing relation should take place between an onset head and its nucleus peer. The main point there is that onset heads are not strong enough to govern their complements therefore should be licensed by nuclear heads. However when we look at the long vowels hosted by branching nuclei in Turkish *merak type* words, we will see that these vowels are stressed therefore nuclei dominating these vowels are metrical heads. A metrical

head in itself should be strong enough to govern its complement. Therefore, for such a nuclei to require an outer support to govern its complement does not seem very plausible (See also Rowicka 1999 for further comments).

According to what has been said so far, it seems that assuming the length alternation in *merak type* words to take place due to the government-licensing mechanism is not a very plausible position to take. As an alternative view, in what follows we will propose that one may account for the length alternation in *merak type* words by keeping the branching (nuclear) structure and making use of the Licensing Inheritance Mechanism Harris (1997). Before giving our account of the phenomena first we will briefly introduce the notion of Licensing Inheritance and the other supplementary mechanisms connected with it.

Any unit in the phonological representation is assumed to be bound to another unit and therefore integrated into the hierarchical organization of the skeleton through the asymmetrical relation called Licensing. The licensing relations in the structure are driven by a general principle of GP as proposed by Harris (1997), following Kaye (1990), the Phonological Licensing Principle:

(38) Phonological Licensing Principle:

"Within a domain all phonological units must be licensed save one, the head of that domain" (Harris 1997:336).

Harris (1997) also differentiates between two types of licensing: A-(utosegmental) Licensing and P-(rosodic) Licensing. A-licensing, according to Harris, is the ability of a certain position to host a particular set of elements, while P-licensing is referred to licensing relations holding between the constituents, starting from the skeletal tier

and projected to higher levels in the prosodic hierarchy. Harris proposes that there are asymmetries in a-licensing potential of different constituents in the structure, which is determined by their place in the p-licensing hierarchy. This is dictated by Licensing Inheritance Principle:

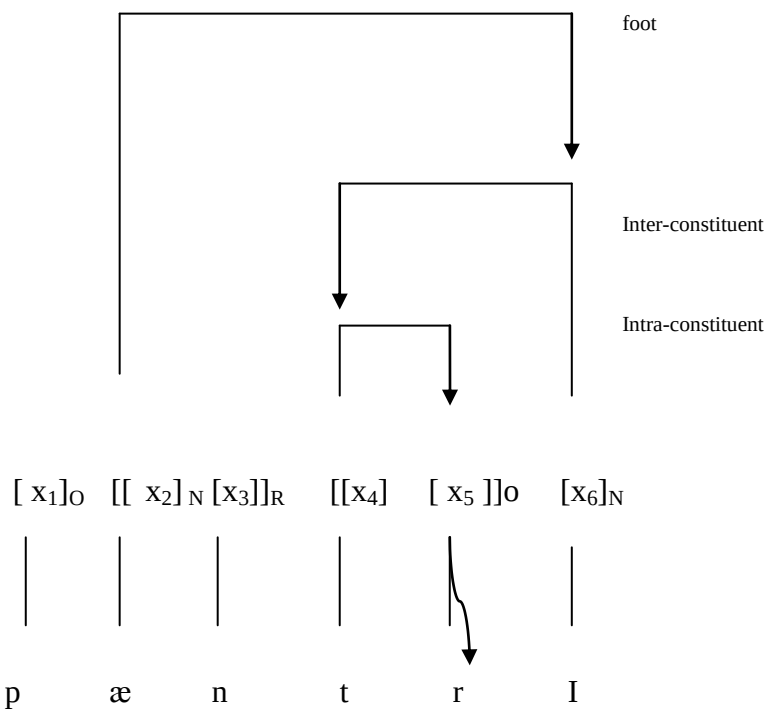
(39) Licensing Inheritance Principle:

"A licensed position inherits its ability to a-license from its licensor"

(Harris 1997:340).

Consider the licensing relations and the distribution of licensing power between the constituents of the word *pantry* illustrated in the bracketed diagram in (40) below (taken from Harris 1997):

(40)



In the diagram above some of the licensing paths are depicted with arrows. x_5 a-licenses its melody [r] and, being the complement of the branching rhyme, is given

p-license by its head onset x_4. x_4 is given p-license by an immediately following Nucleus x6 which is p-licensed by the initial nucleus of the domain x_2[122].

It is assumed that "within a given domain, a p-licensing position has a greater degree of a-licensing potential at its disposal than a p-licensed position." (Harris 1997:340) That basically means that the a-licensing potential of a position is depleted gradually, based on its distance from the p-licensing position (the first nucleus of this domain). [123]

Having given a brief sketch of Licensing Inheritance and how it works, we will show how the length alternation in *merak type* words can be accounted for referring to the Licensing Inheritance Principle. But before that we will give a very brief illustration of how we assume the final empty nuclei in Turkish are to be represented in our discussion (from now on), as this point will be of great relevance in representing the vowel length in *merak type* and *bina type* words.

4.7.1 Representing Domain Endings in Turkish- Trochaic Foot

Following Charette (2008) we assume that all words in Turkish should end in domain final empty nuclei. Charette proposes formation of a domain final trochaic feet, the head of which is a stressed full nucleus and dependent is an empty nucleus which is p-licensed through this relationship. To make the point clearer, we

[122] Note that Harris' usage of p-licensing here (surprisingly) is quite different from this notion's usual usage in GP literature, where p-licensing is used for keeping a position silent.

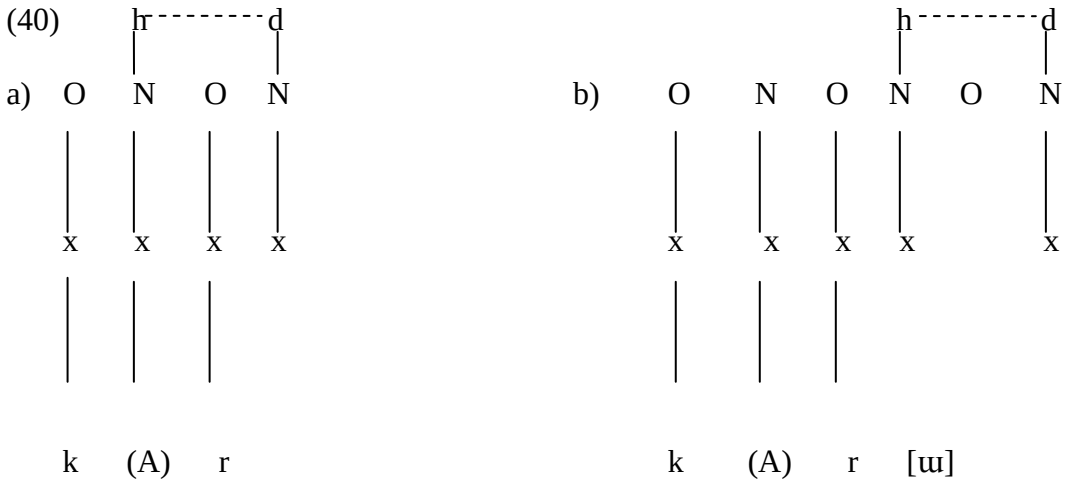
[123] A-licensing potential of a skeletal position refers to its ability to either:

a. directly a-license a melodic expression

b. to confer a-licensing potential on another position

give the following representations of *kar [kar]* ‘snow’ and *karı [karɯ]* ‘wife’ below:

(40)



In (40a) the structure consists of two ON pairs, the first nucleus of the domain is assumed to be the metrical head as it bears primary stress. The final empty nucleus of the domain is the dependent in the trochaic foot; the foot is assumed to be formed between the first and last nucleus of the domain. The notion of trochaic foot is based on the fact that regular stress in Turkish is assigned word finally, the stress assigned vowel is assumed to be the head of the metrical foot which licenses the dependent position to remain silent that is proposed to be an empty nucleus. In (40b), there are three ON pairs, the final of which is empty. Here again the head- dependent relation is contracted between an interpreted final nucleus (the empty melody of this nucleus is claimed to be interpreted in order to serve the role of metrical head, as metrical heads must always be interpreted) of the domain and the empty nucleus to its right. To recapitulate Charette’s proposal, she claims that all words in Turkish end up in empty nuclei which are p-licensed through the formation of trochaic foot, the

dependent of which has to be an empty nucleus.[124]By such a proposal Charette (i) captures the regularity in word final stress by assuming that the metrical heads are full nuclei which have domain final empty dependent nuclei to their right (ii) Claiming that all domain final nuclei are always empty the author resolves the puzzle with domain final high vowels, which constituted a problem for parametrical licensing of domain final nuclei. In the sense that if one assumes that domain final nuclei are parametrically p-licensed (s)he has to expect that all domain final nuclei have to be empty. However in Turkish there are words like *kedi* ' cat' where we have domain final nuclei which are interpreted by vowel harmony. The reason of such interpretation in domain final nuclei was a problem for parametrical p-licensing and required an additional motivation. Charette's trochaic government resolves the problem of this interpretation as it treats word final vowels such as [i] in *kedi* as non-final.

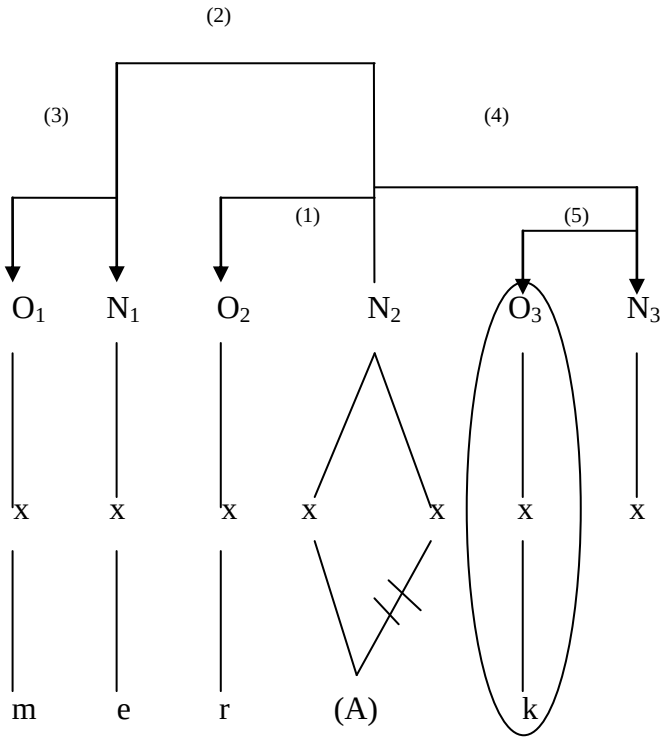
4.7.3 The Role of Licensing Inheritance in Differentiating Merak type from Bina type

Having given the representation of constituent structure we assume for Turkish now we come back to the representation of *merak type* words and the role of the Licensing Inheritance in the length alternation of these vowels.

First, consider the representation of *merak* given in (41) below:

[124] It has to be noted that Charette (2008) based her proposal only the regularly stressed words in Turkish, taking the non-final stressed may give rise to further interpretations of domain final p-licensing. However, as we are dealing only with the words that have long vowels in their composition and such words have been reported to be always finally stressed (Çakır 2006) Charette's account does not have immediate consequences for our data at this point.

(41) merak [meɾák] ‘curiosity’



In the diagram above N_2 (the metrical head) is the p-licensing position of the domain. The licensing power is distributed as following[125]:

(1) N_2 a-licenses its melody and licenses O_2 while O_2 a-licenses its melody [m],

(2) N_2 licenses N_1,

(3) N_1 licenses O_1

(4) N_2 p-licenses N_3, N_2 being the (metrical) head in trochaic foot also licenses N_3 to remain silent,

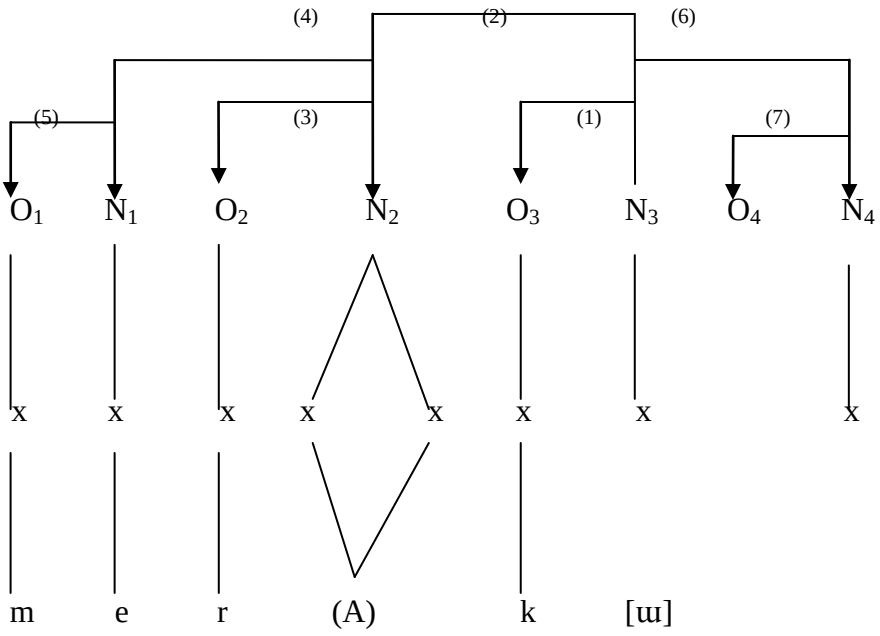
[125] At this particular context we assume licensing to mean prosodic licensing. A-licensing is indicated whenever it is at work as the other type of licensing. Also note that here we assume metrical head to host the p-licensing position in the structure but Turkish also have harmonic heads which may have effect on the distribution of licensing power as well. However for the time being we ignore the status harmonic heads can undergo in terms of prosodic licensing keeping in mind that the status of dual heads (harmonic and metrical) and their interaction needs further investigation.

(5) N_3 licenses O_3.

Taking a closer look, one would notice that N_2 has to license both its melody, its peer onset which dominates [r] , N_1 and N_3 which have to give transfer p-licensing to their peer onsets O_1 and O_3 respectively. N_2 also licenses N_3 to remain silent as dictated by trochaic foot formation, mentioned above.

Our assumption here is that N_2 serves the role to transfer licensing power both to its peer onset and the preceding and following nuclei . N_2 has to give licensing to its peer onset dominating [r], and also being the head in trochaic foot, it p-licenses its dependent. Being divided over many positions, we assume that N_2's own licensing potential is not enough to a-license the melody of the complement of its branch at the same time. Therefore we have the shortening (disassociation of the melody) of the vowel hosted by N_2. However, in the accusative form of merak, that is merakı [meɾa:kɯ] (depicted in 42 below), N_2 is not the metrical head anymore and does not serve the role of p-licensor for the following empty position. We assume that even though N_2 still gives license to its peer onset and the other nuclei in the structure which in turn license their peer onsets, now it is strong enough to a-license the melody in the complement position of its branching structure, hence the realization of the long vowel in [meɾa:kɯ]. In other words, we assume that it is really a matter of a licensing potential that the long vowel has to license its melody, which matters in the length alternation in *merak type* words.

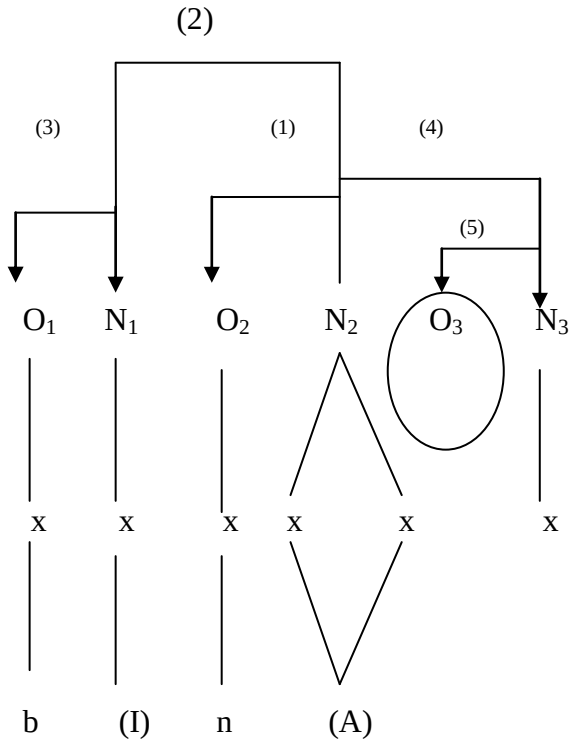
(42) *merakı* *[meɾa:kɯ]* ‘curiosity 3SG. POSS.



Another type of vowel length in Turkish is *bina type* . This type of length can also be represented by branching nucleus structure as in *merak type* words. The difference between the non-alternating length in *bina type* words and alternating one in *merak type* words lies in the following: *bina type* words end in a final full branching nucleus which, being stressed, is the metrical head of the domain at the same time. This nucleus has all the power to license its peer onset, its own melody and the following nucleus N_3 which in turn licenses its empty onset without a point (consider the structure in 43). N_2 also p-licenses its dependent empty position in the domain final trochaic foot. It seems that N_2 in *merak type* words possesses exactly the same property in terms of licensing potential as N_2 in *bina type* words. Then one may wonder what is there which causes length alternation in the former type but

not in the latter. We would claim that it is the status of the onset preceding the domain final empty nucleus. In particular, an onset with a point which dominates a melody as O_3 in (41a) requires more licensing potential then an empty onset without a point as in O_3 in (43a). Therefore, we assume that N_2 of merak in (41a) uses more licensing power than N_2 of bina in (43a) in order to give license to the empty nucleus of the domain which in turn gives license to an onset dominating a melody. Such a depletion in the licensing potential in *merak type* words is reflected in their incapability to a-license the melody in the complement position of their branches.

(43) *bina* *[bina:]* 'a building'



So far, we hope to have indicated the difference between the *merak type* and *bina type* words. We have proposed that both possess a branching (nucleus) structure to represent their long vowels, while it is the difference in the licensing potential of the

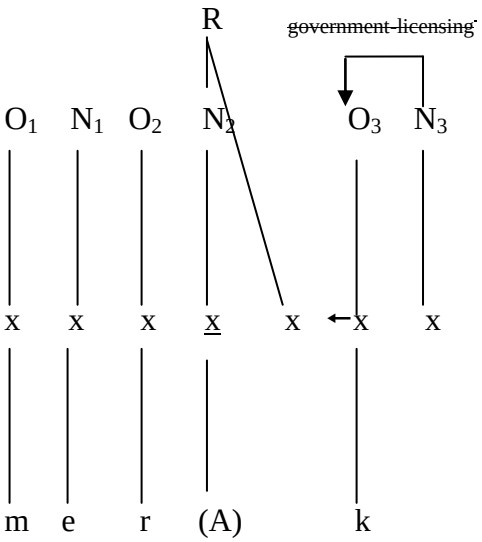
long vowels triggered by the a-licensing potential of the final onset of the domain, that can be referred to in accounting for the alternating and non-alternating vowel length in both forms.

4.7.4 Yet another possibility: Johnsen Vowel in Merak type length

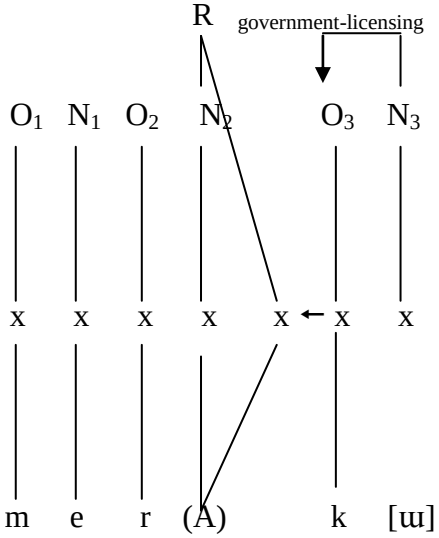
We have posited a branching nucleus as the structure to represent vowel length in *merak type* words. Also in the beginning of this chapter we have postulated a branching nucleus as a representative of lexical length which we assume does not undergo alternation, as in *bina type* length mentioned above. Therefore, the branching structure can be considered to represent non-alternating vowel length. Accordingly one may also propose that the vowel length in *merak type* words can be mapped onto a branching rhyme structure. Under this assumption we would claim that the alternating length can be accounted for by a government-licensing relation holding between an onset head and it nucleus peer. Let us illustrate this in (44) below:

(44)

(a)



(b)



As can be seen in (44a) above it is the absence of an overt government licenser (a full nucleus) in N_3 which prevents O_3 to govern its complement (a rhymal complement). Not given a license to be governed the melody dominated by the rhymal complement is disassociated from its host position, hence the shortening effect in *merak*. On the other hand, in (44b) a vowel of the suffix dominated by N_3 (we ignore the derivational history of the form for the time being) government licenses an onset head dominating [k] to govern the immediately preceding rhymal complement, the long vowel shows up in such a configuration as can be observed above. Now, comparing this with *bina type* words which do not alternate in their final vowel length (*bina [bina:]* ‘ building’ and *binasɪ [bina:sɯ]* ‘ building 3SG.POSS.’) we can assume that *merak type* words and *bina type* words may have different structures

to represent their vowel length. The former may have a branching rhyme structure while the latter may possess a branching nucleus structure.

To summarize, we have searched through all possible representations to find out the most appropriate variant in order to represent vowel length *in dağ type, bina type* and *merak type* words. These three types of length and the possible structures to represent them are depicted in the Table 8 below.

Table 8. Three types of length and their structures in Turkish

	Dağ type	Bina Type	Merak Type
Type of length	alternating	non-alternating	alternating
Non-branching (lexical)	+	-	-
Non-branching (derived)	-	-	-
Branching nucleus	-	+	+
Branching rhyme	-	-	+ (?)

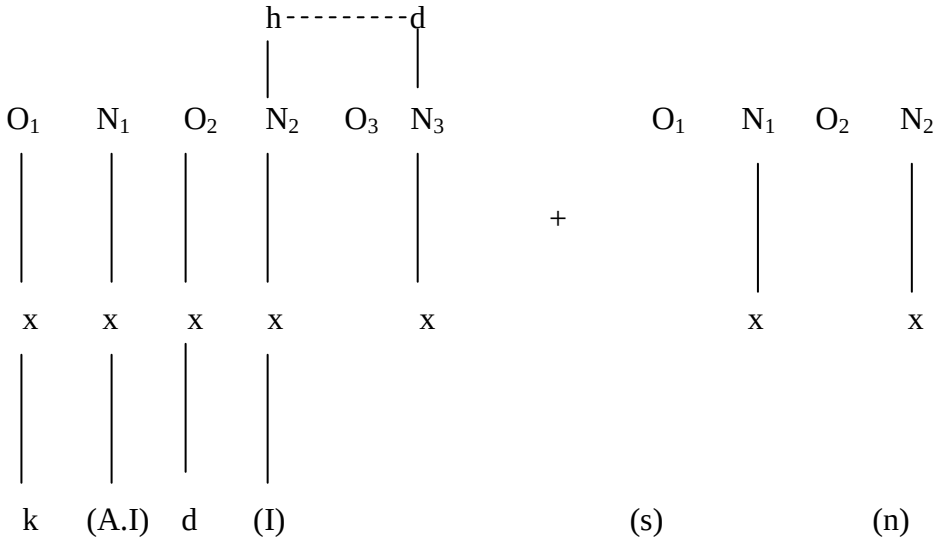
4.8 Behavior of Dağ type Words Through the eyes of GP: Analytic versus Non-Analytic Morphology

The behavior *of dağ type* words is quite challenging as has already been discussed. In order to illustrate this, below we will show the structure of two words in Turkish, one ending in a vowel, the other ending in a consonant, and what happens when a

vowel initial suffix is attached to them. Later on we will discuss how *dağ type* words fit into such a pattern.

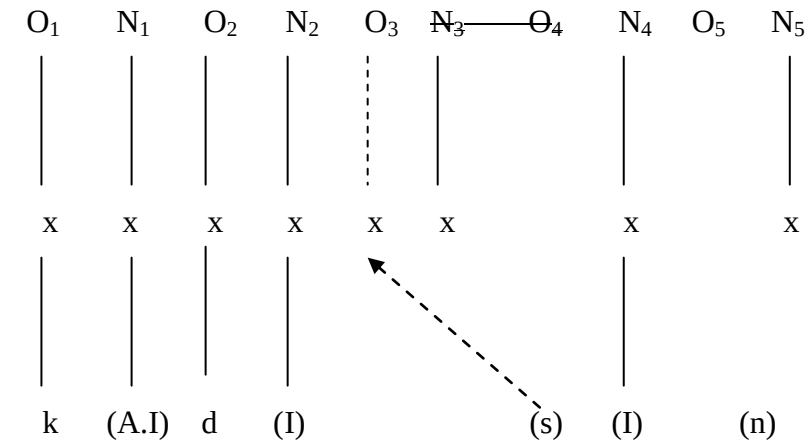
(45) *kedisi* 'cat- 3SG. POSS.'

(a)

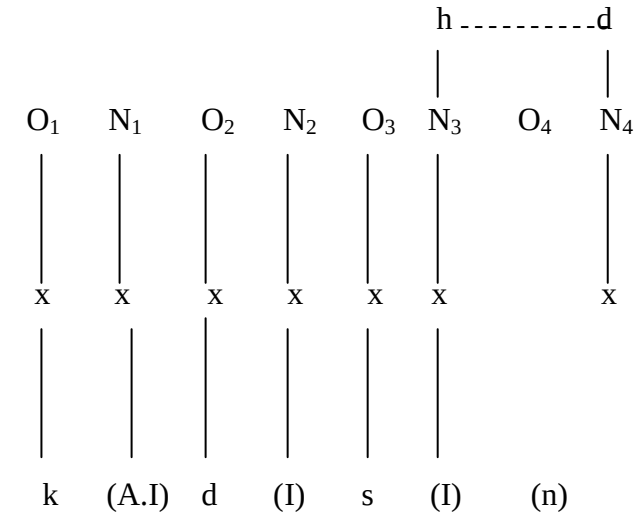


(b)

REDUCTION

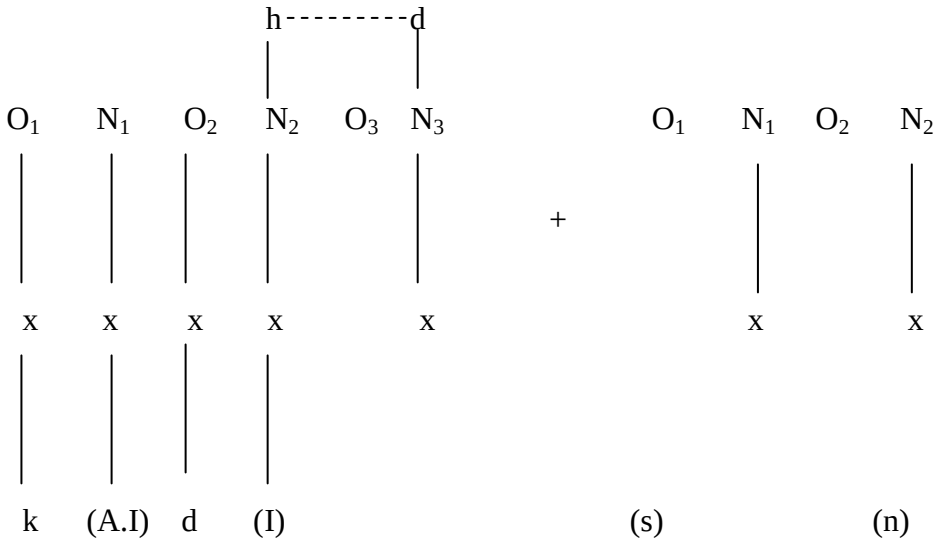


(c)



First, let us see how a word ending in a vowel like *kedi* 'a cat' behaves when a vowel initial suffix is attached to it. Consider the structures illustrated in (45a-c) above. Following Charette (2008), we assume that stems in Turkish end in an empty nucleus which occupies a dependent position in a word final trochaic foot and at the same time is p-licensed through this head-dependent relationship.[126]

(45a)



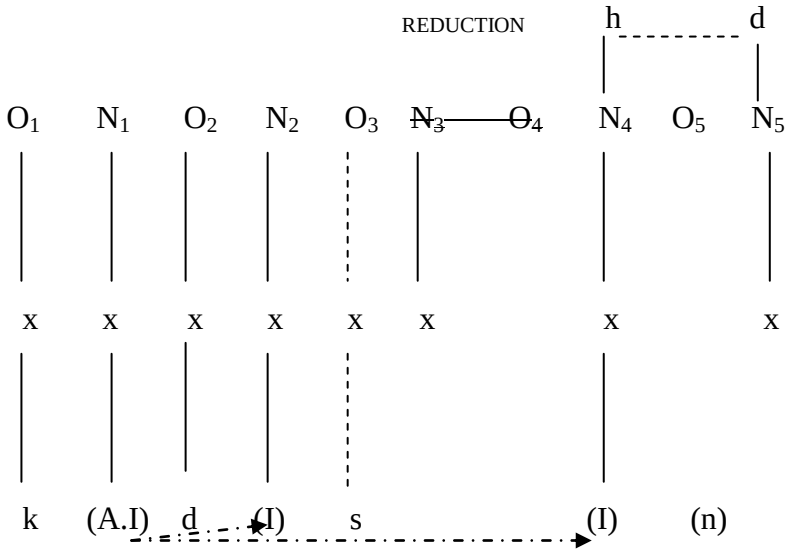
In (45a) N_2 (the stressed nucleus of the stem *kedi*) is the metrical head of this domain and N_3, which occurs to its right, is the dependent empty nucleus. Following Charette (2000), we assume that the third person possessive suffix occupies two onset nucleus pairs, it comes with two floating melodies (s) and (n), two onsets without a point, an initial nucleus (whose melody is determined by the harmony facts of the language) and a final empty nucleus[127]. We also agree with Charette (2000,

[126] Earlier Kaye proposed a parametrical licensing of domain final nucleus (Kaye 1990).

[127] In Chapter 3 we have claimed that domain initial empty onsets dominate a skeletal point, however when it comes to suffixes (dependent domains) we assume that vowel initial suffixes(which come with floating segments in their structure) can dominate an empty onset without a point e.g. third person possessive {-(s)I(n)}.

2006, 2008) in that concatenation takes place analytically in the form above. Recall that a (dependent) analytic domain has the structure of [[A] B]], where phonology first applies to the inner domain [A] then the concatenation of A and B follows, after which the phonology applies to [A+B].

(45b)



Coming back to the derivation in (45b-also given above), following Reduction Principle according to which, "An empty nucleus followed by a pointless onset are removed from any phonological representation in which they occur"(Gussmann and Kaye 1993:433), N_4 (an empty nucleus) followed by an empty onset without a point (O_5) are removed from the structure. As an immediate consequence of this reduction O_3 comes next to N_4. N_4 is interpreted though vowel harmony and O_3 grows its skeletal point (as is illustrated by dotted lines now ready to host the floating melody (s) of the possessive suffix. [128]

[128] As the suffix does not form an independent domain we assume that its stress assignment (foot formation) is done after the concatenation. But note that stress assignment is assumed to be done twice, first in the inner domain (45a) and then it is redone in the outer domain (45c).

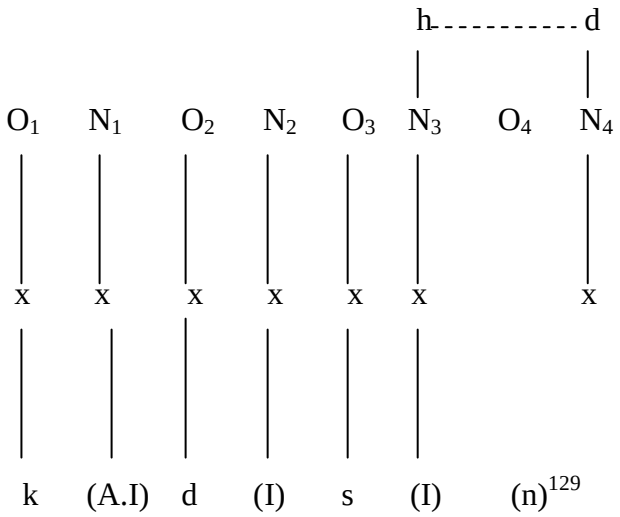
Domain final trochaic foot is formed between N_4 and N_5 .We assume that another floating melody (n) of the suffix { – (s) I (n)} remains as a floating object in the structure.

At this point one may wonder why the floating melody (n) cannot be attached to O_5 which is an empty onset without a point in the same manner as (s) does. More specifically why O_5 does not grow its point to host (n) giving rise to **kedisin* which is not an attested form.

One way to account for this process is to follow Charette's (2000:14) stand, who proposes that Turkish does not allow floating consonants to link to the word final constituent(s). According to this claim the floating (n) in the structure like (45b) will not be able to attach to O_5. It has to be noted that such a stand is arbitrary but at this point we do not have a more plausible account of the phenomenon either. The unexpected behavior of the floating segments in Turkish still needs further investigation but as it is far beyond the scope of our study we leave this topic for the future research.

In (45c-also depicted below) we show the final structure of the third person singular form of *kedi* after the suffixation. N_3 is the metrical head of the domain.

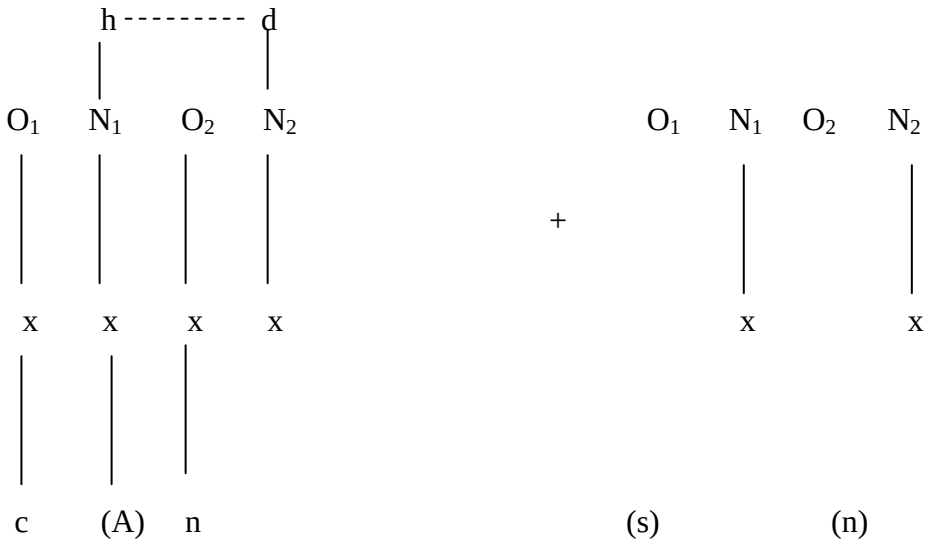
(45c)



Next, we will illustrate the behavior of a stem ending in a consonant when a vowel initial suffix is (3SG.POSS.) attached. Consider the representations in (46a-c) below.

(46) *canı* *[dʒnaɯ]* ‘ soul-3SG.POSS.’

(a)

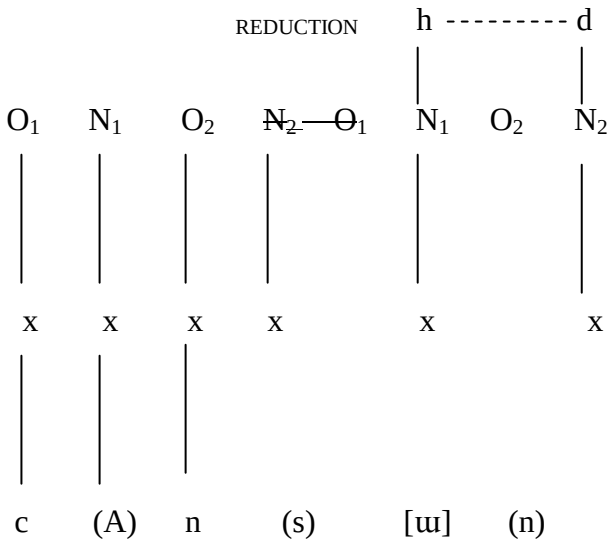


[129] Note that the ( ) indicate vocalic melody when it is put across elements otherwise it indicates latent buffer segments in the text.

In (46a), we depict the stem which consists of two ON pairs. The first nucleus of the stem being the metrical head forms a trochaic foot with the empty dependent nucleus to its right. N_2. The suffix, as has already been mentioned, has two ON pairs, two floating melodies and initial nucleus whose melody is determined by the vowel harmony and a final empty nucleus.

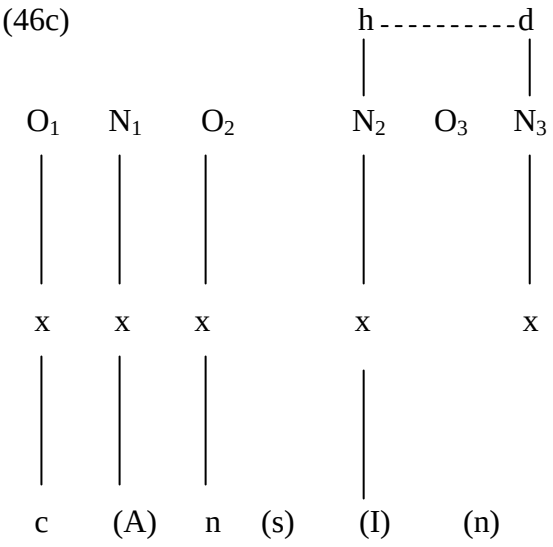
In (46b) below, the final empty nucleus of the stem followed by an empty onset without a point of the suffix undergoes reduction, dictated by the Reduction Principle, i.e. both are eliminated from the structure. After reduction, the floating melody (s) does not find itself a place to be associated hence is not realized. The first nucleus of the suffix is interpreted through vowel harmony and becomes the metrical head of the domain, forming a left headed foot with an empty dependent on the right. The second floating melody (n) of the suffix remains latent in the structure.

(46b)



In (46c) we give the final structure obtained at the end of the derivation. There are three ON pairs the final one of which is empty and the trochaic foot is formed between N_2 and N_3 as is illustrated in the structure below.

(46c)



In the representations above in (45b) and (46b), it seems that the concatenation follows the intrinsic rule ordering which directly follows from how a word is built up[130]. In particular, when a suffix concatenates to a stem/root as in (45b) the ordering of the processes involved in this derivation: 1) reduction, 2) association of the floating melody to the empty onset now available to host it (similar ordering can be observed in 46b), occur in the natural flow of derivation and as an immediate consequence of it.

[130] Compare this with the extrinsic rule ordering of SPE, which is based on arbitrary list of pre-specified rules.

4.8.1 Dağ type words in V-initial Suffixation

Dağ type words which end in long vowel would be expected to pattern with other vowel final words such as kedi above when a vowel initial suffix is attached to them. In other words, the third person singular possessive form of *dağ [da:]* is expected to be **dağsı [da:sɯ]*. However, this is not the case, we get *dağı [daɯ]* as the attested form. Such behavior of *dağ type* words has been claimed in the non-GP literature to require a more complex derivation (involving C-deletion and V-lengthening stages) which was assumed to be a phonological derivation (Sezer 1986, Denwood 2002). As the treatment of *dağ behavior* in other frameworks was already discussed in the previous section, in what follows we will propose two (theoretically) possible analyses of the phenomenon, but this time looking through the eyes of GP.

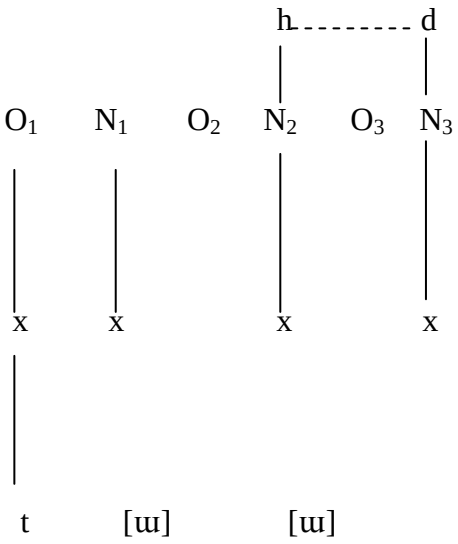
We will claim that *dağ-type* behavior should not be considered as a phonological process given the *Principle of Non-Arbitrariness* and that GP allows only for two basic phonological processes (linking and de-linking). Rather, it must be morphological.

4.8.2 Dağ type Behavior: Beyond the borders of GP

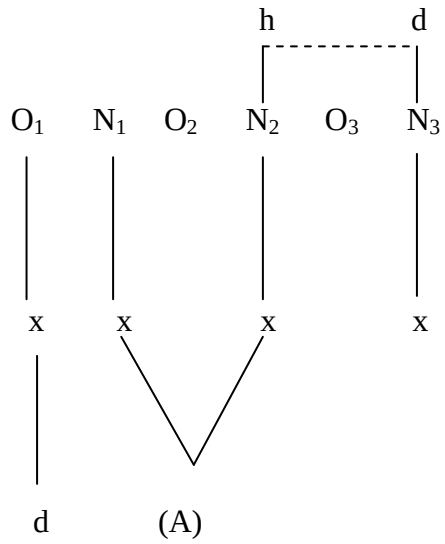
We have already proposed that *dağ type* words have a domain final long vowel which is represented by three ON pairs. The first two nuclei in this representation do not differ in their melody. (Recall that we have adapted Charette 's (2008) word final trochaic government to represent domain endings in Turkish). Consider the structures for *dağ [da:]* 'a mountain' and *tığ [tɯ:]*'crochet hook' in (47) below:

(47)

(a) *[tɯ:]* 'crochet hook'

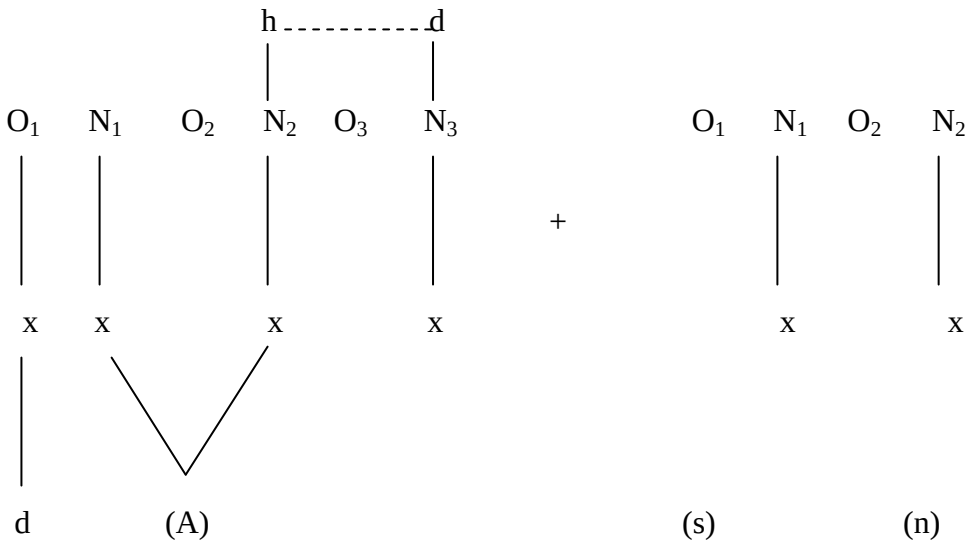


(b) *[da:]* ' a mountain'



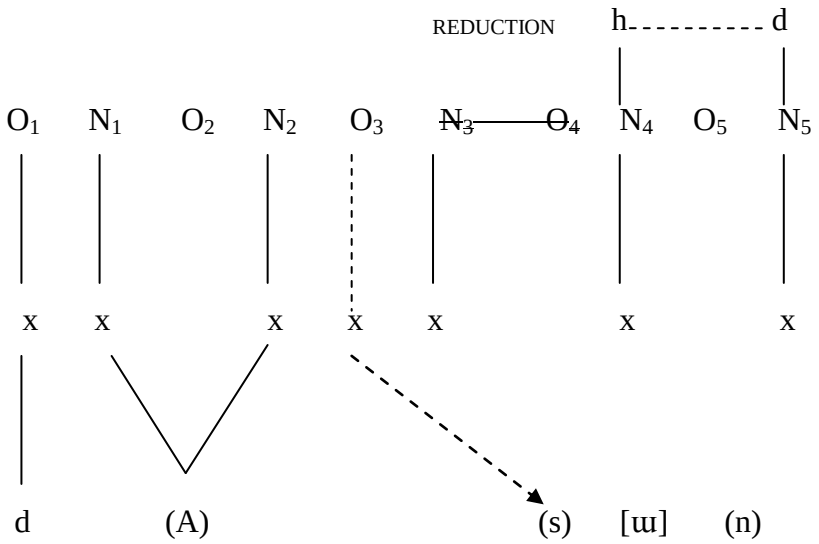
Now, let us see how these words behave when a vowel initial suffix (third person singular possessive) is attached to them. First we will give the expected case that is *dağ [da:]→*dağsı [da:sɯ]*, then we will try to describe the processes involved in the derivation of the attested form *[daɯ]*.

(48a)



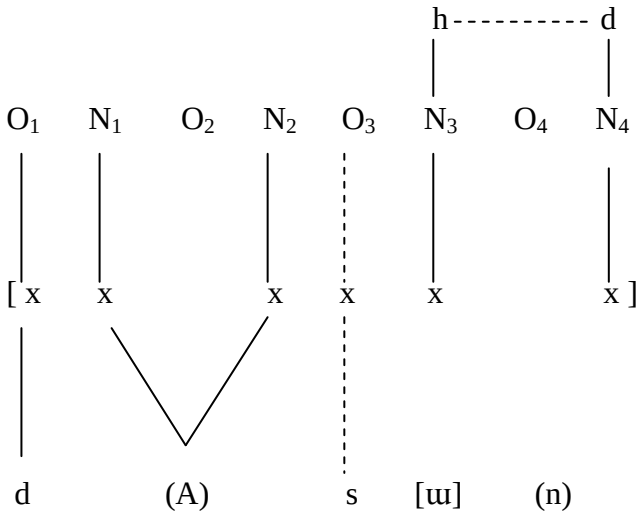
In (48a) we show what *dağ* 'mountain' with its three ON pairs, the last one of which is empty, and the third person singular possessive suffix, which contains of two ON pairs, looks like before concatenation. As has already been mentioned in the stem dağ *[da:] 'a mountain'*, N_1 and N_2 share the same melody, while N_2 is also the metrical head of the domain which forms a trochaic foot and licenses N_3 on its right to stay silent. The suffix, as has already been illustrated above, comes with two floating melodies (s) and (n) and its first nucleus (N_1) is to be realized through vowel harmony. Given that *dağ* also ends in a vowel just like *kedi*, the very first expectation is that the former word reveals similar behavior with the latter before vowel initial suffixes (The assumption that the suffix attaches to the stem analytically remains).

(48b)



In (48b) above, N_3 (an empty nucleus) and O_4 (an empty onset without a point) are reduced from the structure as is dictated by the Reduction Principle. The floating melody of the suffix (s), attaches to O_3 (indicated with dotted lines), an empty onset which grows its point. N_4 is interpreted through vowel harmony and the trochaic foot is formed now between the two final nuclei of the domain (N_4 and N_5).

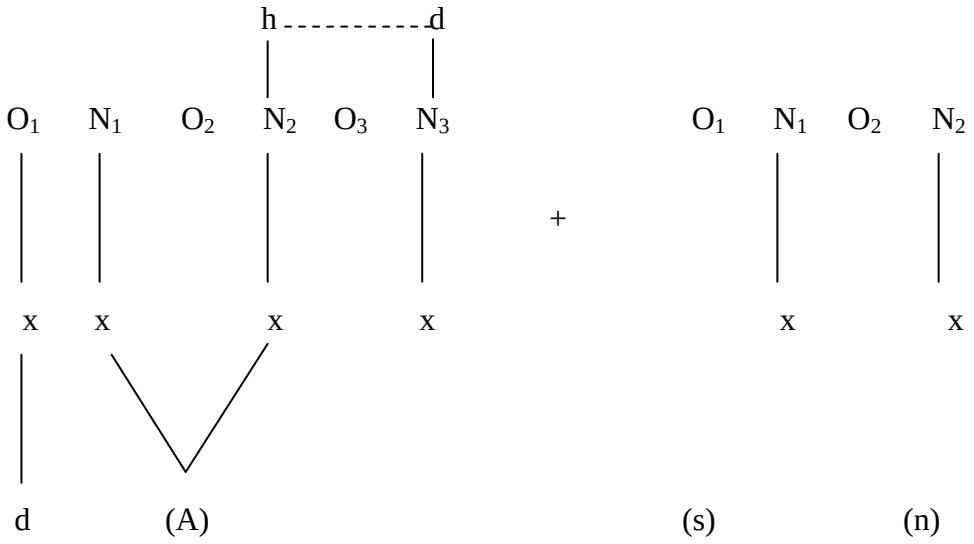
*(48c)



In (48c) above, we give the final (hypothetical) structure of the third possessive singular form of *dağ*. However, the hypothesized form does not match the attested one, which is [daɯ]. It seems that to go from *dağ [da:]* to *dağı [daɯ]* requires more complex derivation than we have assumed in (48a-c). Having said that, let us see what kind of additional processes we need to account for the third possessive singular form of *dağ*, and whether GP allows for these (We are still assuming that the morphology involved is of analytical type).

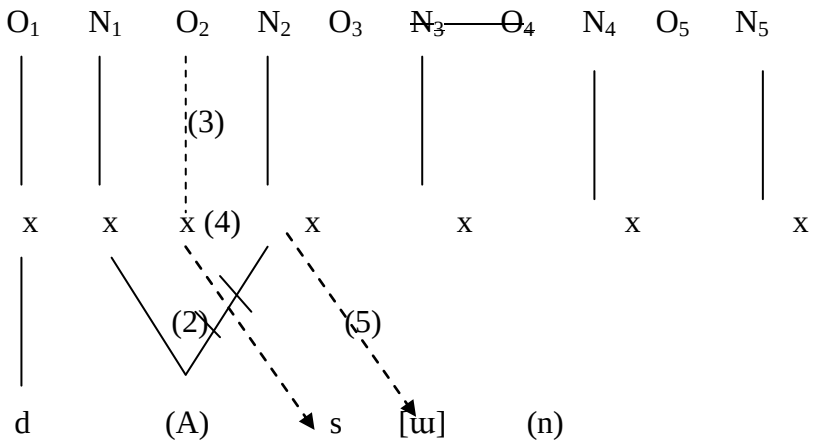
As is illustrated in (49a-d) below, the derivation of the third person singular form of *dağ [da:]*, if one assumes that concatenation of stem with the suffix takes place analytically, involves a number of processes. Let us go one by one through these processes and see what kind of problems they raise.

(49a)



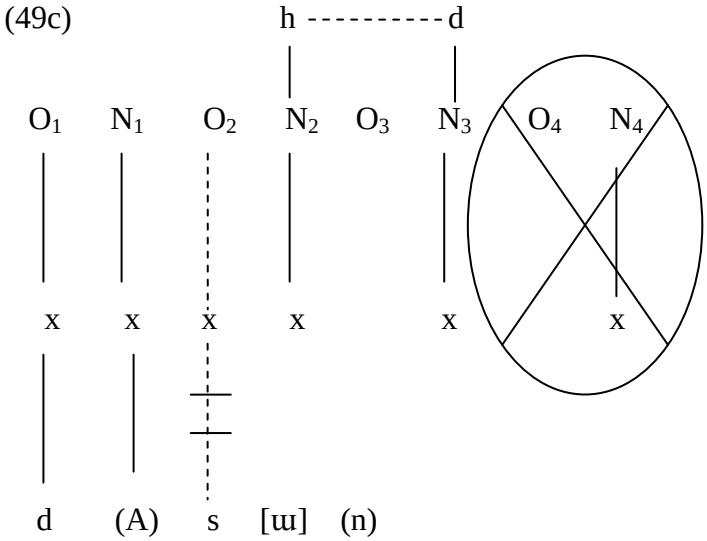
(49a) above is similar to (48a) and is the representation of *dağ* with three ON pairs, the last one of which is empty, and the third person singular possessive suffix, which contains of two ON pairs, looks like before concatenation.

(49b) REDUCTION (1)



In (49b), N_3 (an empty nucleus) and O_4 (an empty onset without a point) are reduced from the structure through Reduction Principle.It seems that the melody shared between the N_1 and N_2 of the stem, has to be disassociated from N_2, hence the vowel shortening. After disassociation of the melody (the element A), O_2 of the stem can be expected to grow its point (one may wonder why it is O_2 but not O_3 which grows its point, we would say that O_2 is the first available empty nucleus, hence should have precedence in hosting floating melody) which is now ready to host the floating melody (s) of the suffix. However, this item is not interpreted or is interpreted for some reason.

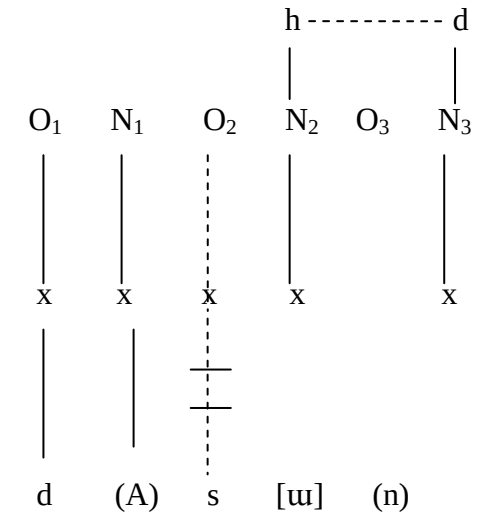
(49c)



As can be seen in (49c), N_2 of the stem (whose melody originally comes with the initial nucleus of the suffix) gets interpreted through vowel harmony and occupies the metrical head position forming a left headed trochaic foot. The final ON pair is unused and gets deleted from the structure and the suffixal floating melody (n), not having found an (non-final) empty onset to be associated to, remains floating.

In (49d) below, we show the final structure of *[daɯ]*, at the end of the derivation.

(49d)



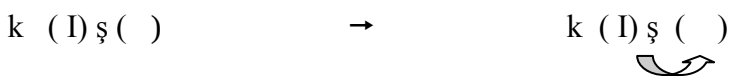
As far as the problematic aspects of this derivation are concerned, we have the following points ; First, assuming the disassociation of the melody shared between N_1 and N_2 would violate the Principle of Non-Arbitrariness which states that "There is a direct relation between a phonological process and the context in which it occurs." In this case there isn't any kind of direct relationship between the disassociation of the melody from N2 and the interpretation of [ɯ] in that position.

In (49b) we have indicated reduction with (1), the disassociation process with (2), growing of (x) point with (3), the (s) association with (4) and the interpretation of N_3 with (5). It seems that the disassociation process provides an environment both for (s) association/disassociation and the interpretation (realization) of N_2 to take place (it also follows from being a metrical head). This resembles extrinsic rule ordering of SPE type, where one rule precedes the other providing it with an environment/ a content to apply, a relation known as feeding.[131] GP by no means allows for an extrinsic rule ordering to take place among the processes throughout the derivation.

Moreover, as dictated by the Principle of Non-Arbitrariness given above, we expect a direct relation between a process and the context it takes place it. Consider how a non-arbitrary link is created between the trigger (source melody) and process (spreading) in Turkish I-harmony occurring in the word *kişi* ' a man', illustrated below in (50):

[131] Two rules A and B are in a potentially feeding relation if the application of A creates a new input to B. If B applies, then A is said to feed B; if B does not apply, the A and B stand in a counterfeeding relation (Kenstowicz 1994: 94).

(50) *kişi* *[kiʃi]* ‘a man’



Not going into the details of vowel harmony and its conditions in Turkish, let us focus on the I harmony observable in *kişi*. As can be seen the first nucleus of the stem, which is the harmonic head of the domain at the same time, dominates an element I and the second nucleus is assumed to be lexically empty. Vowel harmony requires the element I to spread rightwards and being interpreted in the second nucleus of the domain. The spreading of element I from harmonic head to recessive position takes place locally and as can be seen there is a direct relation between the trigger (element I) and the spreading process.[132]

However such kind of direct relationship cannot be observed between the disassociation of the lexically assigned melody and the (s) association and the interpretation of the melody dominated by N_2 in (49b). Also, the reason why suffixal floating melody (s) is not interpreted where we expect it to (in the O_2 of the stem) remains mysterious.

Yet another problematic side of the derivation in (49) is the status of the second floating melody (n) which is considered to be a part of the third person singular possessive suffix.[133]

[132] For further conditions and the details on Turkish vowel harmony see (Charette and Göksel 1994/96; Pöchtrager 2009).

[133] We have to note that this is not a problem of this particular form but a problem in general with suffixes which come with floating melodies in Turkish.

In (49c) it can be seen that the trochaic foot is formed between N_2 and N_3 of the stem. The final two ON pair is empty and unused therefore considered to be subject to deletion. However, if we consider Charette's (2000) claim that floating melody cannot be hosted by final constituents, one may wonder what prevents (n) from being associated with empty O_1 of the suffix, which is obviously not the final constituent of the domain. If seems that again there is some kind of extrinsic ordering of the processes that is final ON pair are elided from the structure first, not providing any space for (n) to be associated with. Here again we face arbitrariness.

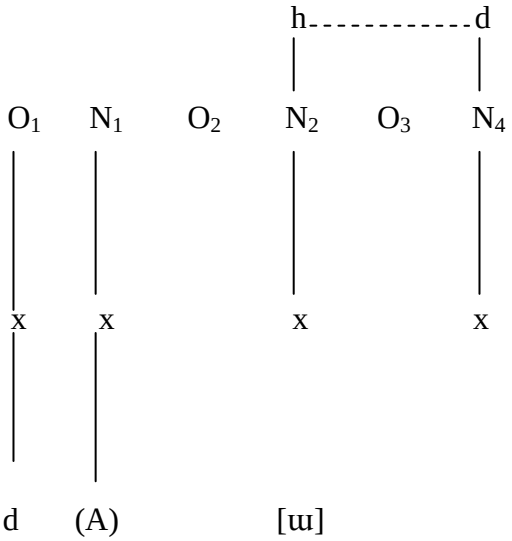
To recapitulate what we have said so far, the third singular possessive form of dağ seems to have gone through a number of phonologically arbitrary operations, during its derivation. In GP, which only admits fusion and fission of elements in phonological processes which furthermore have to take place in a non-arbitrary manner (Kaye 1995:312), the behavior of *dağ* in particular, and that of *dağ type words* in general, seems to be inexpressible.

One way to treat the behavior of *dağ type words* can be the assumption that the possessive suffix (or any V-initial suffix) is attached non-analytically in such forms. Recall that non-analytical morphology is not visible to phonology. In other words, if we have a domain of the type [A+B], where A is considered to be the stem and B the suffix, the phonology applies to the concatenated form, that is [AB], at once.

Coming to our case, assuming that the possessive form of dağ, which is *[daɯ]*, is a non-analytical domain would mean that it should be treated in the same manner as a simplex Turkish word cadı *[dʒadɯ]* ' witch' in terms of domainhood.

More specifically, both should be considered to consist of one (single) domain. Consider the representation below:

(51) *[da: + (s) I (n)] → [daɯ]*



Assuming the structure in (51) for the possessive form of dağ, one immediately gets rid of all the problems with extrinsic ordering relations (between the reduction of unused ON pairs and association of floating (n) for instance) and arbitrary processes such as vowel shortening (cf. 49b). That is, forms like [daɯ] may be assumed to be stored in the lexicon as chunks, therefore we won't have much of a chance (or a need) to handle the patterns *[da:]-[daɯ]* by derivation, at least not phonologically. If the forms are derivationally related, that derivation must be of a morphological nature.

Also, when we assume non-analytic morphology to be involved in [daɯ] we will assign different morphological status to the same suffix (third person singular): Analytical in forms like *kedisi* and non-analytical in *dağ type* words. Such a case is not all that unusual in the GP literature, consider Kaye's analytical and non-analytical treatment of simple past suffix in seeped and kept, respectively (Kaye 1995:310).

To summarize, in this chapter we have given a short literature survey on *dağ type* words and their behavior in vowel initial suffixation. Then we put *dağ type* words in the structure of GP and we have compared the length represented by *dağ type* words with other types of length in Turkish—*bina type* and *merak type*—. Finally we have evaluated *dağ type* behavior from the GP perspective, concluding that this phenomenon involves non-analytic morphology and should not be considered as a phonological process.

CHAPTER 5

DOĞA- DUA TYPE WORDS[134]

5.1 Introduction

In the previous chapter we have analyzed the structure and behavior of *dağ type* words, comparing the type of length they represent with *bina* and *merak* type length in Turkish. We have observed that *dağ type,* has a non-alternating onset without a point in their structure. In this chapter we will focus on *doğa-dua type* words which we claim have an empty onset with a point that can alternate with its pointless counterpart in quick/casual speech.

Phonetically adjacent vowels can either occur in the environments where there is <ğ> word medially between vowels in orthographic representation of native words such as *doğa [doa]* 'nature' or in borrowings such as *dua [dua:]* 'a prayer' in Turkish. This environment is significant in that here two successive vowels (phonetically adjacent) come together and due to this contact a number of (optional)

[134] Doğa type is (assumed to be) a class of words which contain (with reference to traditional terminology) "phonetically adjacent" heterosyllabic vowels or in GP terms words which contain a domain medial empty onset which can either alternate its point or get interpreted via element spreading from the ambient nucleus.

phonological processes can take place in colloquial/quick speech.[135] These processes are vowel assimilation/vowel coalescence and glide insertion.[136]

According to Kabak (2007), one of the first systematic analyses of this environment, the trigger underlying those processes is claimed to be the fact that in Turkish hetero-syllabic vowel sequences (hiatus) are disfavored, hence are (optionally) subject to resolution in casual speech. The resolution mechanisms, assumed to be determined by the quality of the flanking vowels, are either vowel assimilation or glide insertion. In particular, a word like *ağır [aɯr]* ' heavy' can also be pronounced as [a:r] in casual speech where the second vowel in the sequence of V.V (where "." indicates syllable boundary) can fully assimilate to the preceding vowel. On the other hand, *eğit- [eit]* 'to educate' does not correspond to **[eet]* but rather it is pronounced as [ejit] in the casual speech where this time a glide is inserted into V.V sequence.

Kabak (2007:1379), claims that Turkish is one of the languages which do not readily allow certain types of identical sequences in words and systematically applies a number of phonological processes to resolve such sequences. In what follows, going through Kabak's analysis of "hiatus and its resolution" we will have a fresh look on hiatus and how its resolution takes place, if there is any at all. We will claim that this is one of the environments where an empty onset with a point (Ox) can be

[135] It has to be noted that in descriptive studies it was claimed that word medially, between vowels " Soft G" either does not have any phonetic reflex or can optionally be manifested as a palatal glide in the environment of front vowels or labial glide in the environment of round vowels (Aksan 1978; Göksel and Kerslake 2005). However, there hasn't been said much on the formation of the optional variants (why do we have them, what is the cause –effect relationship between the trigger of the palatal glide and the front vowel, have they been formed via phonological process or are they stored in the lexicon as such).

[136] For proposals regarding vowel assimilation we will refer to Sezer (1986) and Kabak (2007), for the glide insertion we will refer to Kabak (2007).

attested in the structure of Turkish. Moreover, we will claim that due to the presence of Ox in this environment a number of phonological changes take place e.g., A-spreading.

5.2 A Challenging Term : Hiatus

According to Kabak (2007) hetero-syllabic vowel sequences (assumed to form hiatus) are disfavored in Turkish and are (optionally) subject to resolution in casual registers (as stated above)[137]. However, if one takes into consideration the Minimalist Hypothesis which states that "Processes apply whenever the conditions that trigger them are satisfied" (Kaye 1995:291), Kabak's stand may seem problematic, in that if a language favors hetero-syllabic vowel sequences in one certain context why should it disfavor the same type of sequences in that very similar context at the same time.

Another point is related to the adjacency issue, in particular if hetero-syllabic vowel sequences are to be banned (in casual speech) and this is triggered by the fact that successive (identical) vowel sequences (hetero-syllabic) cannot stay next to each other, one may wonder how come they can optionally stay adjacent such as in *ağır [aɯr]* 'heavy', *oğul [oul]* 'son', *göğüs [gøys]* 'breast' in careful speech. More specifically, what is meant by "adjacency" and how the adjacency for V.V sequences

[137] It has to be noted that Kabak (2007:1380) also mentions "hiatus resolution through allomorphy" where V.V sequences obtained through suffixation are always banned. Consider, *kapı* 'door', **kapıı* 'door-ACC.' but *kapı-***y***ı* .

differs in careful speech from that in casual speech? In the following subsection, we will try to clarify these points making use of GP structures.

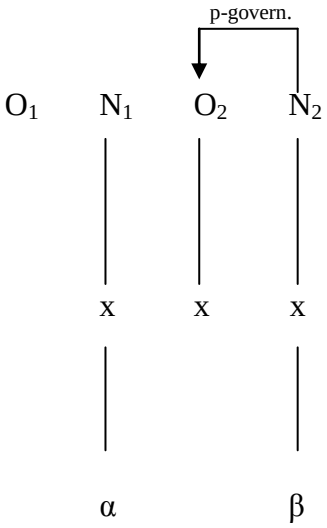
5.2.1 No hetero-syllabic sequences any more: N-O-N

As has been pointed out in the theory section, GP completely dispenses with the notion of "syllable". Instead we have successive Onset- Nucleus pairs bound together by licensing relations throughout the structure. Therefore, constituents of the same type (O-O or N-N) cannot possibly be adjacent. This is dictated by the Onset Licensing Principle which states that "An onset head must be licensed by a nuclear position" (Harris 1992:380).

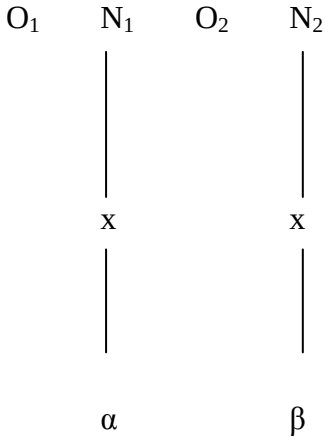
Only in contexts where two successive nuclei are separated by an onset without a point these nuclei can be skeletally (hence melodically) adjacent. In this case the melodies hosted by those two nuclei can see each other. Consider two structures below in (1a-b):

(1)

(a) Careful speech



(b) Casual speech[138]



In (1a-b) above α and β correspond to an element or a combination of elements and α ≠β, these melodies stay in the structure either as in (1a) separated by an onset point or as in (1b) skeletally-melodically adjacent. We will claim that (1a) is the environment where an empty onset with a point can stay in the structure. We will further claim that this empty onset with a point in this context can (potentially) lose its point in casual/quick speech giving rise to the structure in (1b) .[139] Moreover, we

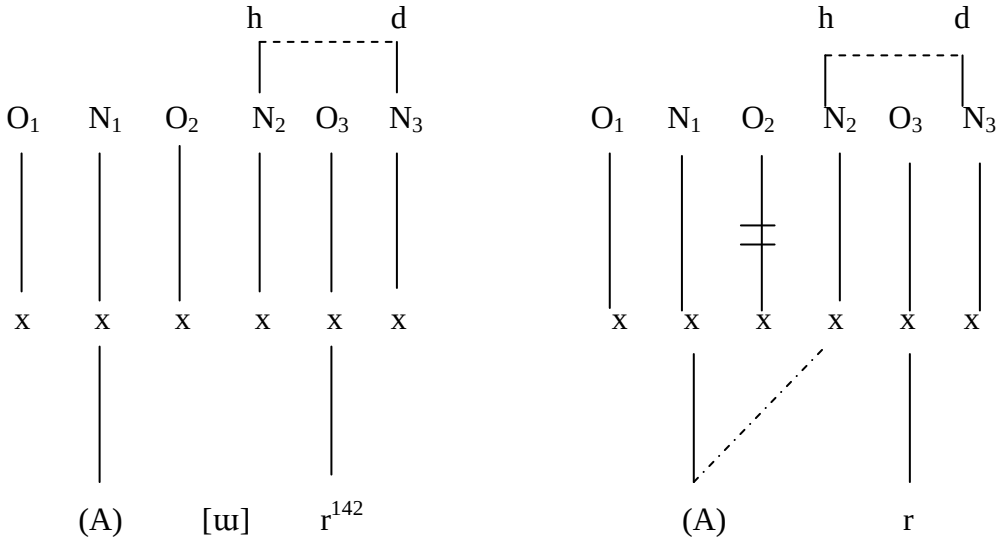
[138] β can either be a lexically specified melody as (U) in *ağu [au]* 'poison' or a position associated with this melody can be lexically empty as (U) in *oğul [oul]* 'son', which is considered to be interpreted there due to the requirements of vowel harmony.

[139] The notions of quick and casual speech will be used interchangeably in this thesis. What is meant by quick/casual speech roughly corresponds to Ergenç's definition of colloquial speech: " Colloquial speech is an act, a form of communication which the members of a language society make by applying the intonation rules of the language through a subconscious drive"(Ergenç 2002:53). Careful-slow speech on the other hand is the version of speech based on the written forms, pronounced prominently/carefully(see also for expression, conference and reading speech definitions given by Ergenç 2002: 54-54.)

will consider that Ox (an empty onset with a point) is avoided in quick-speech phonology, thus is either subject to deletion as in (1b) or is interpreted via spreading of the ambient elements[140]. Consider two pronunciations of the word *ağır* 'heavy' in careful and casual speech illustrated in the structures below[141]:

(2)

[aɯr] careful speech b. [a:r] casual speech



In (2a) above O_2 is an empty onset properly governed by the following realized nucleus N_2. In (2b) on the other hand, which is the quick/casual speech

[140] Kabak assumes a number of extra mechanisms to account for the assimilation and gliding in those environments e.g. (1) [coronal] and [high] are specified in Turkish (2) Only specified features can spread. Our account is simpler and as can be seen from the respresentations there is a direct relationship between the context (across an empty onset without a point) and the process (e.g. A spreading) which suggests a non-arbitrary explanation.

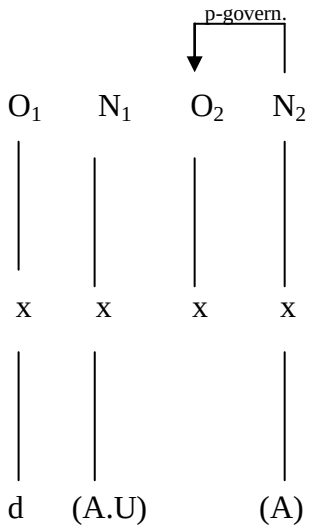
[141] Recall that we have adapted Charette's (2008) trochaic foot structure (see for Chapter 4), indicate with h(ead)-d(ependent) structure in (2a-b). For the sake of simplicity the head and dependent positions won't be marked each time throughout the discussion, but the reader should keep in mind that the word final empty nuclei are kept silent through such a governing relationship.

[142] The initial empty onset in the structures is given with a point (Ox), the reasons that particular representation are discussed in Chapter 3.

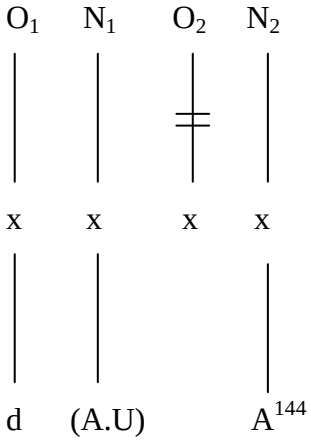
representation of *ağır* (an empty onset with a point) O_2 loses its point and the melody associated with N_1 spreads rightwards to N_2 across this empty position.[143] Below we will discuss this process which can take place in casual speech due to x-slot deletion (of an empty onset), but for the time being our concern is to exemplify the x-erosion process in the quick/casual-speech phonology. Let us give another example. Consider the representations of the word *doğa [doa]* 'nature' both in careful and casual speech as is depicted below in (3a-b).

(3)

a. *[doa]* careful speech



b. *[doa]* casual speech



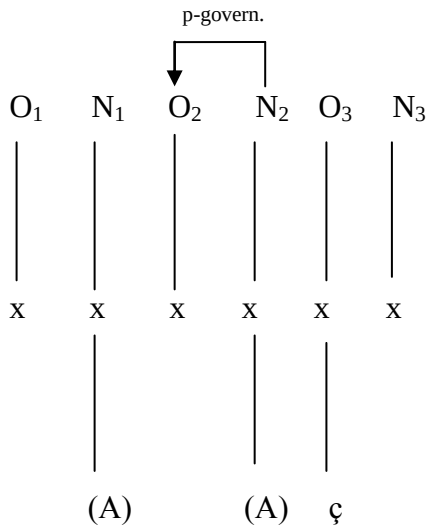
[143] Note that there can be ideolectal differences regarding the choice of the two options. That is, some speakers may only prefer to use casual speech version even in formal contexts.

[144] Kabak (2007), claims that doğa has two optional variants *[doa]~[dowa]* we will discuss his assumptions and their consequences later on, for the time being we consider doğa to have only one pronunciation that is [doa] in both careful and casual speech. Also, U's failure to spread is due to the restrictions on vowel harmony—U cannot spread to the expression containing element A-- hence we have k(A.U)ll(A)r not *kollor (A.U)ll(A.U)r 'hands'(Refer to Charette and Göksel 1996 for further details).

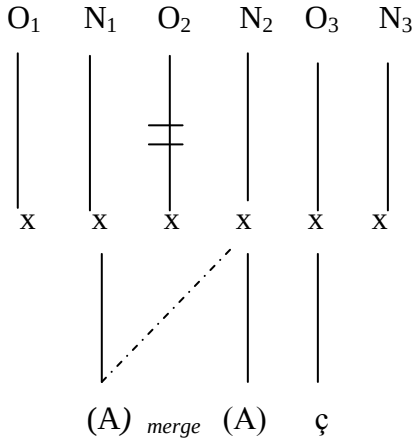
We assume that an empty onset with a point in (3a) again can lose its skeletal point as in (3b). We claim that the nuclear sequences in both structures are equally well-formed. The reason for A-spreading to take place in (2b) but not in (3b) is determined by further conditions (to be given next). If we are dealing with identical lexically specified melodies which become skeletally adjacent , we claim that they are subject to a merge operation in casual speech. Consider the structures for *ağaç [aatʃ]* 'tree' in (4a-b) below.

(4)

a. [aaç] careful speech



b. [a:ç] casual speech



It is assumed that the melody dominated by N_1 and N_2 in (4a), cannot be skeletally adjacent when O_2 loses its point as in (4b), a fact dictated by Obligatory Contour Principle (Harris 1994:173). According to which, "any intra-morphemic geminate cannot constitute a sequence of independent melodic expressions instead it can only be represented as the simultaneous association of a single expression to two skeletal

positions", a point also illustrated in Chapter 2 sec.2.6. Therefore, skeletally adjacent melody -the element A- is merged in one element shared between N_1 - N_2 and we get a long vowel rather than a sequence of two successive vowels as is represented in (4b).

5.3 Optional Phonological Processes: V-assimilation and Glide Insertion

Having illustrated that Turkish accepts melody to stay skeletally adjacent (except the lexically specified identical ones-the sequence of which is resolved via merge operation in casual speech), now we will give further details on phonological processes which can take place in casual speech, making extensive use of the data given in Kabak (2007).[145]

5.3.1 Vowel Assimilation = A Spreading

First of all, let us see when and how vowel assimilation, one of the " hiatus resolution" mechanisms applies according to Kabak (2007) and how the same process can be dealt with in GP terms.

Regarding hiatus resolution through vowel assimilation, the following formulation, which is completely arbitrary, has been assumed on the basis of the conditions given in (Sezer 1986 and Kabak 2007):

[145] Note that we only consider Kabak's preliminary assumptions regarding the environments of hiatus, we do not go into the details of his underspecification account of the hiatus resolution mechanisms.

(5)

$V_1\ V_2 \rightarrow [V_1V_1]$ iff:

a) V_2 is high

b) $V_1$and V_2 agree in backness and roundness[146]

c) [e.i] →[e.e] being an exceptional case*

Consider the examples given in (6) below:

(6) Hiatus resolution through vowel assimilation

(1) a.	*[souk]*	~	*[sook]*	'cold'
(2) b.	*[aız]*	~	*[aaz]*	'mouth'
(3) c.	*[göüs]*	~	*[göös]*	'breast'
(4) d.	*[eik]*	~	**[eek]*	'bent'
(5) e.	*[soan]*	~	**[soon]*	'onion'

In (6a-c) above the VV sequences undergo assimilation, the conditions of which are stated in (5) above. In (6d) *[eik]* includes two vowels [e] and[i], both of which agree in frontness and the second one is high, normally we expect this sequence to undergo assimilation resulting in *[eek]*, however this is not the optional version of eğik [eik], at least in Standard Turkish which we are referring to here. Therefore

[146]Sezer (1986:242) gives further restrictions, viz. the assimilation of [ɯ] to [a] is quite regular such as in *[kaɯt]~[kaat]* 'paper' whilst the assimilation of [y] or [u] to the preceding vowel is more restrictive. For instance while [oul]~[ool] is fine according to the author, in [søyt]~*[søøt] the option which has undergone assimilation is bad.

such a sequence is considered to be an exception to the conditions stated in (5a-b). In (6e) vowels of a VV sequence agree in backness, however the second one is low (counter condition a in 5) hence it cannot be assimilated to the preceding vowel.

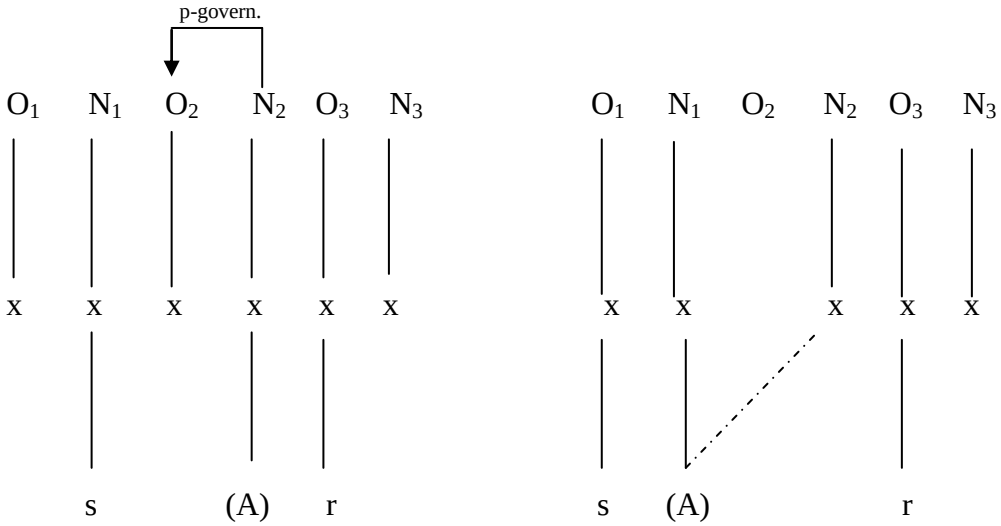
As is illustrated above, the ungrammatical forms 6 (d-e) indicate that not all VV sequences are allowed to undergo assimilation. The ones which cannot undergo such a process are either resolved via glide insertion (*faiz [fa:iz] ~[fa:yiz])* or do not undergo any change (*noel [noel]*) depending on the quality of vowels in that particular environment. Below, we will give the environments (as described in Kabak 2007) where glide insertion take place.

5.3.1.1 A spreading within domains

When we look at the forms which are claimed to undergo assimilation through the eyes of GP we can say it is really a matter of element spreading to take place in the context provided by deletion of the skeletal point of Ox in casual/quick speech. Consider the structure of the word *sağır* 'deaf' below in (7a-b) in careful and casual speech respectively:

(7)

a. *[saɯr]* careful speech b. *[sa:r]* casual speech



In (7a), an empty onset with a point is p-licensed through a proper government relation contracted between N_2 and O_2. In (7b) on the other hand O_2 loses its point, providing the environment for A-spreading rightwards. One may immediately raise two questions regarding the structure in (7b): i) How could it be the case that O_2 loses its point which is licensed to stay in the structure through p-goverment, a relation contracted in the lexicon which is not subject to alternation throughout the course of derivation as dictated by the Projection Principle [147]. ii) It has already been proposed in accounts on vowel harmony that the element A in Turkish is inactive in terms of spreading Charette and Göksel (1994/1996). So how come that in this context it can spread?

[147] "Governing relations are defined at the level of lexical representation and remain constant throughout a phonological derivation" (Kaye 1990:221).

Regarding the first question we would suggest that the quick-speech realm is somehow different in that it allows for some processes which we do not expect to come across within the borders of phonology proper as handled by GP[148]. In other words, we may say that quick speech phonology can allow arbitrary processes to take place violating the Principle of Non-Arbitrariness[149] which should not be considered as phonological processes.

Meanwhile, it is difficult to explain why the skeletal point of O_2 in (7a) should be subject to deletion, being licensed to stay in the structure. So, we suggest to ascribe this process to quick/casual-speech phonology, which deviates from the regular phonological domain, the reasons of which are far beyond the scope of the topic at hand. Coming to the second question, we will propose that the element A, can spread only across an empty onset without a point to a lexically empty position. As in the structure proposed for *sağır* in casual speech, the element A spreads rightwards across an empty onset without a point, resulting in *[saar]*. In terms of stress, the representation in (7a) has its stress on the last nucleus. In (7b) we assume that the stress is on N_2. In other words N_2 is the metrical head, as there is only one melody interpreted in two positions, the second being the metrical head we have to assume that the pronunciation of sağır in quick speech is really [saAr] where we have a sequence of two a's, the bold one indicating the stress. However it is interesting that native speakers do not differentiate between the forms *[saAr]* and

[148] There is not much said on the relationship between careful speech and slow speech in GP literature. We assume that these two realms follow different requirements. e.g., careful speech phonology strictly obeys Non-Arbitrariness principle while in casual speech arbitrary processes can take place.

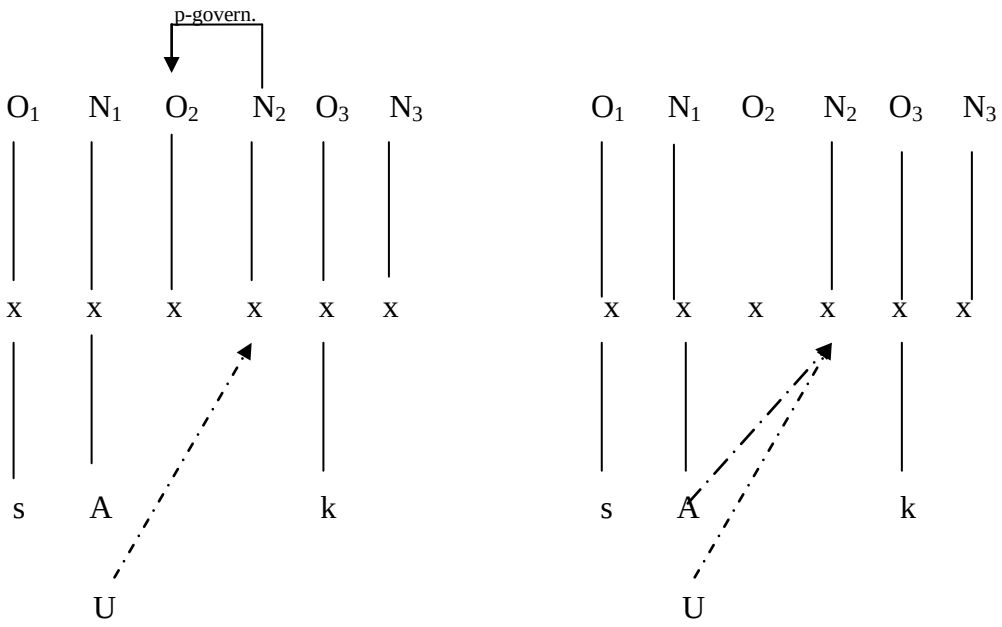
[149] **"**There is a direct relation between a phonological process and the context in which it occurs" (KLV 1990:194).

[sa:r], the former consisting of a sequence of two vowels the second of which being stressed, the latter on the other hand including one long vowel.

Let us see further contexts for A-spreading and illustrate how the spreading as "interpretation" is applied there (cf. Chapter 4 sec.4.5.1). Consider the structures of the form *soğuk* 'cold' given in (8) below:

(8)

a. [souk] careful speech b. [sook] ~[so:k] casual speech



In (8a) the melody hosted by N_1 is lexically specified as a combination of element A and U (the headedness status and the order of elements in compound expressions are ignored here), N_2 is a lexically empty nucleus and the element U is interpreted in this position as dictated by harmony facts of the language. (See also Denwood 2002, for a slightly different account on V-harmony in Turkish, an interpretation-approach). In (8b), this time the element A is also interpreted in N_2, now an empty onset without a point providing the context for such an interpretation to take place.

Let us consider once more the possible contexts where the spreading-interpretation of the element A can take place in (9) below:

(9)

careful speech	*casual speech*	*gloss*
(a) (A)ğ( )r [aɯr]	(A)ğ( )r [aɯr] ~[aar]	'heavy'
(b)s(A.U)ğ(U)k [souk]	s(U.A)ğ( )k [sook]~ [so:k]	'cold'
(c) g(U.I.A)ğ(U.I)s [gøys]	g(U.I.A)ğ( )s [gøøs] ~[gø:s]	'breast'
(d) (I.A)ğ (I)k [eik]	*(I.A)ğ (I)k [eik]~*[eek]	'bent'

According to the data given in (9a-d), it can be seen that the element A can spread rightwards (across an empty onset without a point) when it is on its own (from a simplex expression), or in combination with the element U (9b) or with both U and I (9c). However when the element A is in combination with the element I it cannot spread rightwards. Hence the ungrammatical form in (9d) **[eek]*. Such an I-U asymmetry does not come as a surprise at all. Vowel harmony facts already suggest that while the element I is fully active in terms of spreading, the environment for U-spreading is more restricted (Charette and Göksel 1994/1996, Pöchtrager 2009 among others).[150] However, according to the Minimalist Hypothesis we still have to give a plausible explanation for A spreading to be banned in the very environment where it is expected to occur.

[150] U-I asymmetries are also quite common in a number of other languages such as Polish, German, Finnish, Scandinavian languages.

One stand to take is to assign a different headedness status to the element A when it occurs in combination with the element I as opposed to the environments where it occurs in combination with the elements I and U and the element U.

Recall that in elements may differ in terms of roles they undergo in combination with the other elements. In particular, an element can be a head or an operator in phonological expressions, which is determined by language particular parameter(s) –Licensing Constraints (LC). There can be only one head, per one phonological expression. Now, given the I-U asymmetry, if we assume that element A is the head when combined with the element I and the operator otherwise we get the following:

Option # 1: A is the head in (A.I) and an operator elsewhere.

According to this condition the licensing constraints determining the vowel inventory are to be given as follows: i) U must be a head ii) A can license operators. Consider the table 9 below where we try to determine Turkish vowel harmony generated by these constraints.

Table 9. Vowel Inventory of Turkish (hypothetical)

(A)	~~(A.I)~~	(A.I.U)	(A)	~~(A.I.U)~~
(I)	(A.U)	~~(A.U.I)~~	~~(U)~~	( )
(U)	(I.A)	~~(I.U.A)~~	(I)	
	(I.U)		(A.I)	
	~~(U.A)~~		~~(A.U)~~	
	~~(U.I)~~		~~(I.U)~~	

Given that we have three elements (A-I-U) to represent vocalic inventory in Turkish the LC given above will generate Turkish vowel inventory as such (headed expressions correspond to tense vowels while headless ones indicate lax ones):

(A), (I), (U), (A.U), (I.A), (I.U), (A.I.U), (A), (I), (A.I), ( )

According to this inventory there is only one [u] (U) tense one—in Turkish which is obviously not the case given that we have words like *kutu* ' a box' where the final u is lax. This inventory also suggests that there are both lax and tense [i] and [a] in Turkish which are inadequate characterizations given that all high vowels in Turkish are lax word finally. Consider also (Pöchtrager 2009-for the headedness of element A in Turkish).

We can also assume that element A may be headless in combination with element I and headed otherwise:

Option # 2: A is an operator in (A.I) and a head elsewhere

The second option, suggests "A must be a head" as a licensing constraint where both which (rougly) generates (A), (A.I), (A.U), (A.U.I) to occur in the vowel inventory of Turkish (We won't give the whole list here). (A), (A.U), (A.U.I) are in contradiction with (A.I), as "A must be a head" requires element A to be a head in all environments. However in (A.I), A is not the head. Hence we say that the two LC's, A can license operators (A.U) and A can not license operators, contradict. It also does not generate headless (lax) expression such as (A) which is claimed to be present in suffixes e.g., –l(A)r (Pöchtrager 2009).

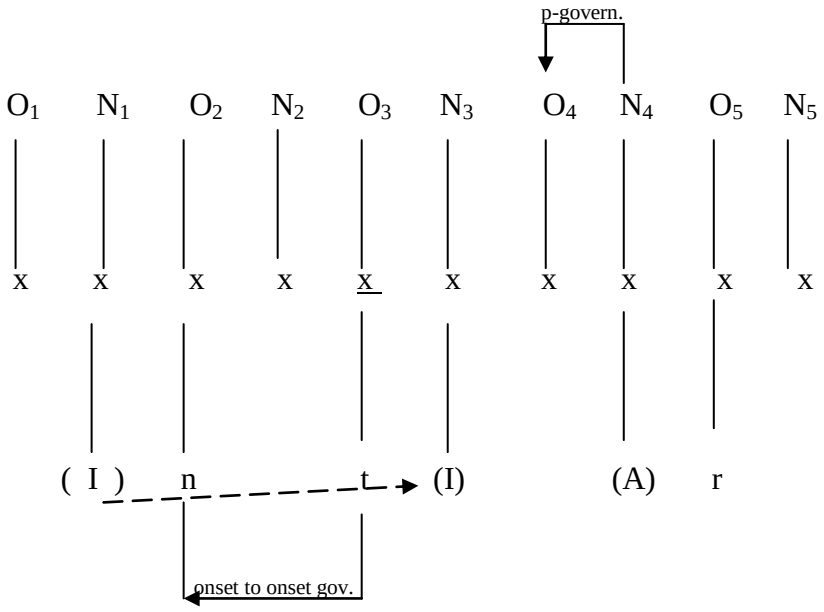
Both options are problematic in that they make false predictions regarding the Turkish vowel It seems that the headedness is not quite a plausible explanation to be

given in order to determine the I-U asymmetry in connection with A-spreading. At this point we leave this issue for further discussion and continue with the directionality of A-spreading within domains.

There are a number of examples such as: *ittihat/ittaat* ‘concord’, *intihap/intaap* ‘election’, *iltihap/iltaap* ‘inflammation’, *imtihan/imtaan* ‘examination’, *intihar/intaar* ‘suicide’, *izdiham/izdaam* ‘crowd’, *layiha/layaa*, ‘memorandum’, *iftihar/iftaar* ‘gratification’ and *istihare/istaare* ‘lucid dream’. The common characteristic of these words is that they are all Arabic loans and that the element A can spread leftwards in these domains in quick/casual speech, as illustrated in the example below:

(10) *intihar* ‘suicide’ *[intihar/intiar]~[intaar]*[151]

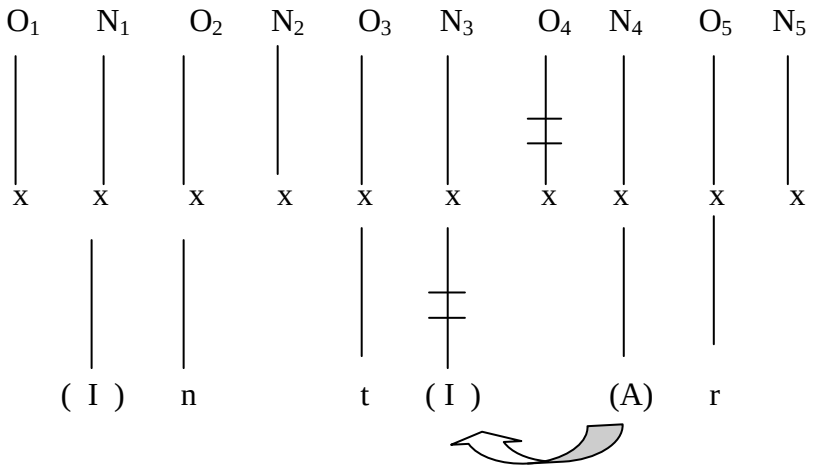
(a) *intihar* *[intiar]* careful speech



[151] *[intihar]* pronounced with [h] is very rare, if not used at all, therefore we take into consideration only *[intiar]* as an the option pronounced in careful speech. One may also assume that the element H in *[inti(H)ar]* has been gradually lost in the course of time.

In (10a) above we assume that N_2 is an empty nucleus licensed to remain uninterpreted through a left headed onset-to-onset government relation (for O-to-O government relation see Chapter 2 sec.2.3) O_4 is a lexically empty onset which is p-governed by N_4. In quick speech, this onset loses the skeletal slot it dominates as illustrated in (10b).

(b) *[intaar]* ~ *[inta:r]* casual speech



It is important to note that the element I interpreted in N_2 (a lexically empty nucleus) is assumed not to be interpreted any more in that certain position when the element A spreads to this nucleus.

To recapitulate the facts discussed so far, we have proposed that in Turkish the element A, which was claimed to be inactive in terms of spreading (Charette and Göksel 1994/1996), can actually have a very narrow environment of spreading within domains. That is,

- A-spreads across an onset without a point
- Target: to a lexically empty nucleus

- Source: Nuclei containing (A), (A.U), (A.I.U) but not (A.I)
- Direction: Both rightwards and leftwards

5.3.1.2 A-spreading across domains

The element A can also spread across independent domains in quick speech, evidence comes from an (optional) V-coalescence process claimed to take place across boundaries in Turkish[152] (Demircan: 1981). Consider the data given in table 10 and table 11 below. The first three columns consist of the data from Demircan (1981). In the first column there are two utterances, the first one ending in and the second one beginning with a vowel (These utterances are of various type: noun phrases (*ekşi elma*), compounds (*baba evi*), verb phrases (*kızı aradı*). The second and third columns show how the two vowel sequences are pronounced in slow speech and quick speech, respectively. Demircan (1981) assumes that there is a glottal stop [ʔ] between a domain initial and domain final vowels in slow speech. Even though we do not agree with Demircan on the glottal stop between two vowel sounds in that environment, we will use "ʔ" between two vowels across domains to show that they are pronounced separately. In other words that they differ in terms of stress. Demircan indicates length with "ğ", we will make use of ":" to show vowel length.

[152] By independent domain, we mean anyo utterances which can stay on its own in the sentence.

Table 10. Vowel Coalescence Across Domain

	Slow Speech	Quick Speech
kendinE Eder	e-ʔe	e:
gözE Aldı	e-ʔa	a:
banA Acı	a-ʔa	a:
babA Evi	a-ʔe	e:
gecE Öldü	e-ʔö	ö:
öylE Oldu	e-ʔo	o:
anA Okulu	a-ʔo	o:
onA Öde	a-ʔö	ö:
ekşİ Elma	i-ʔe	e:
elİ Açık	e-ʔa	a:
kızI AradI	ı-ʔa	a:
tatlI Ekmek	I-ʔe	e:
senİ Övdü	i-ʔö	ö:
işİ Oldu	i-ʔo	o:
yarI Oldu	ı-ʔo	o:
onU Ezdi	u-ʔe	e:
ölÜ Evi	ü-ʔe	e:
köyÜ Aradı	ü-ʔa	a:
yolU Açık	u-ʔa	a:
bizİ Öptü	i-ʔö	ö:
köyÜ Özledi	ü-ʔö	ö:
süslÜ Olsun	ü-ʔo	o:
okU Onu	u-ʔo	o:
borcU Öde	u-ʔö	ö:
elİ İşte	e-ʔi	i:
yerİ Islat	i-ʔı	ı:
sarI Işık	ı-ʔı	ı:
kızI İste	ı-ʔi	i:
ekşİ Üzüm	i-ʔü	ü:
elİ Uzun	i-ʔu	u:
damI Uçtu	ı-ʔu	u:
kızI Üzdü	ı-ʔü	ü:
gözÜ İlişti	ü-ʔi	i:
gözü Islak	ü-ʔı	ı:
suyu Ilındı	u-ʔı	ı:
sonU İyi	u-ʔi	i:
üçÜ Üzgün	ü-ʔü	ü:
köyÜ Uzak	ü-ʔu	u:
yolU Uzun	u-ʔu	u:
onU Ütüle	u-ʔü	ü:

Table 11. No Coalescence

	Slow Speech	Quick Speech
bizE İlet	e-ʔi	ei/ey
körlerE Işık	e-ʔı	eı/ew
havA Ilık	a-ʔı	aı
ayA indi	a-ʔi	ai/ei/ey
genE Üşüdü	e-ü	eü/öü/ew
yerE Uzan	e-ʔu	eu
banA Uygun	a-ʔu	au/oy
havA Üssü	a-ʔü	aü/öw
O İyi	o-ʔi	oi
O Isındı	o-ʔı	oı/ow

Focusing on the V.V sequences produced in quick speech across independent domains, Demircan describes the coalescence process taking place in this environment in terms of distinctive features. The author claims that if these sequences consist of high-high; high-low and low-low vowels, then the first vowel completely assimilates to the second one and the direction of the assimilation is from right to left (see table 10)[153]. However, if the VV sequence is low-high, then such an assimilation cannot take place, this time these two vowels either remain as they are in slow speech or a diphthong formation takes place (see. Table 11).

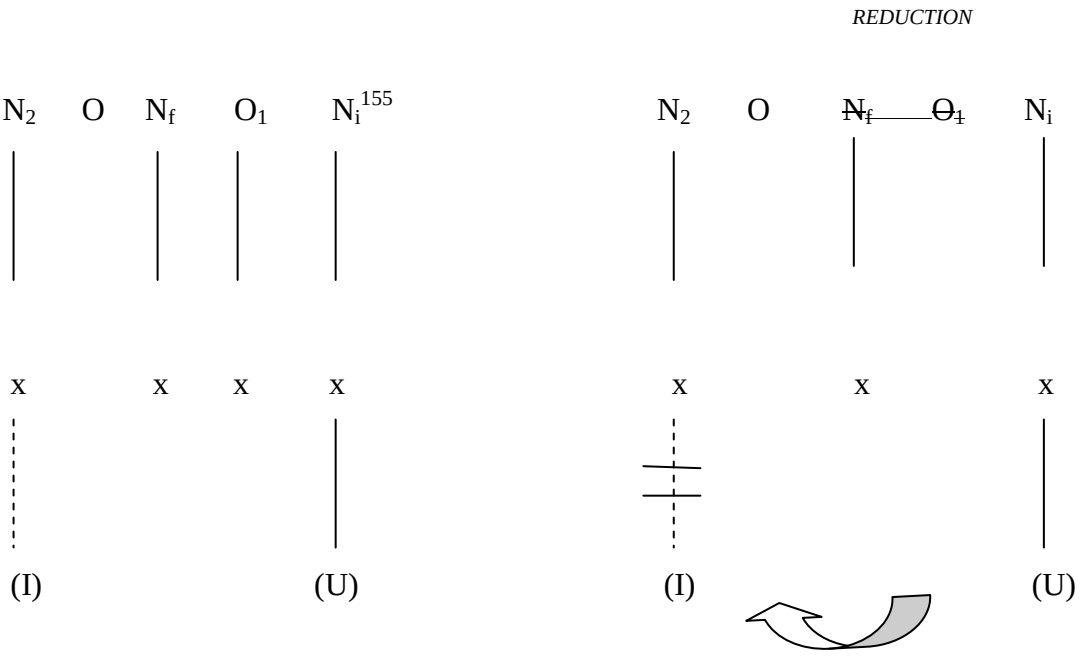
[153] We have to note that, Demircan does not mention the methodology he used to compile these sequences and the author does not explain how he determined the quick speech variants. We fed "Speech Analyzer" programme with each sequence in table 10 and varying only the speech rate of the utterances we observed total assimilation of high-high; high-low and low-low vowels in favor of the latter vowel of the sequence.

When describing this phenomenon in GP terms,[154] we would propose the following conditions regarding the V-coalescence, based on element spreading:

1) *The melody hosted by N_i spreads (leftwards) into N_x, if N_x is a lexically empty nucleus.* Consider the representation of *elİ Uzun* 'thefty' from table 10, as it is illustrated below (The utterances are represented only partially).

(11)

(a) slow speech: *eli uzun* (b) quick speech: *elu:zun*



In (11a) above we assume that the initial onset of the second domain "O_1" is an onset with a point, its point flanked by two nuclei, therefore N_f and N_i are not melodically/skeletally adjacent. In (11b) on the other hand we assume that O_1 loses its point in quick speech, this time N_f (an empty nucleus) is followed by an empty onset without a point which provides an environment for the Reduction Principle

[154] The final nucleus of the first domain will be referred as (N-final) N_f and the initial nucleus of the last domain as (N-initial) N_i.

[155] N_2 corresponds to N_x which is assumed to be pre-final nucleus.

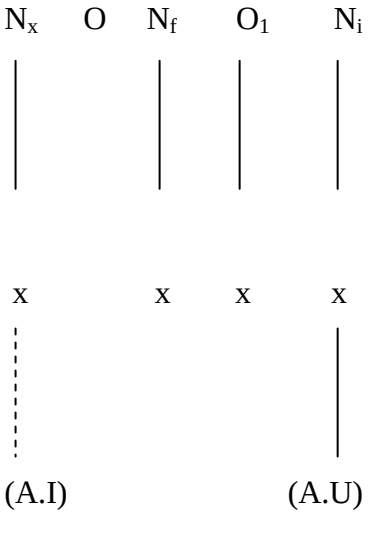
to apply.[156]Now after the reduction of N_f-O_1 from the structure N_x and N_i become skeletally /melodically adjacent. As can be seen, the melody of N_i spreads leftwards (we assume spreading as an interpretation here, as has already been mentioned in the previous chapter)—across an onset without a point— into N_x whose melody is not interpreted in that position anymore. All the utterances (in table 10) high-lighted in blue behave in the same way.

2*) If N_x is lexically filled (here it is the element A, which is considered to be lexically present) and N_i contains the element A in combination with other elements as well: The melody combined with element A in N_i spreads leftwards to Nx (which also contains the element A) resulting in a long vowel where the element A is present as well.* Consider the representation of *öylE Oldu* ' it happened as such' depicted in (12) below.

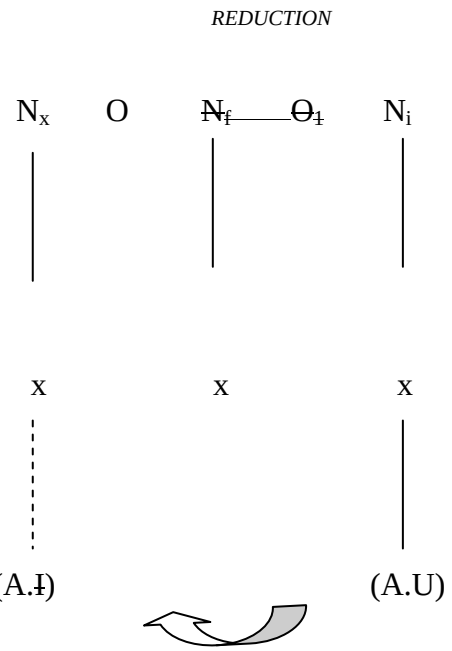
[156] Reduction Principle: " An empty nucleus followed by a pointless onset are removed from any phonological representation in which they occur" (Gussmann and Kaye 1993:433).

(12)

(a) slow speech: *öyle oldu*



(b) quick speech: *öylo:ldu*



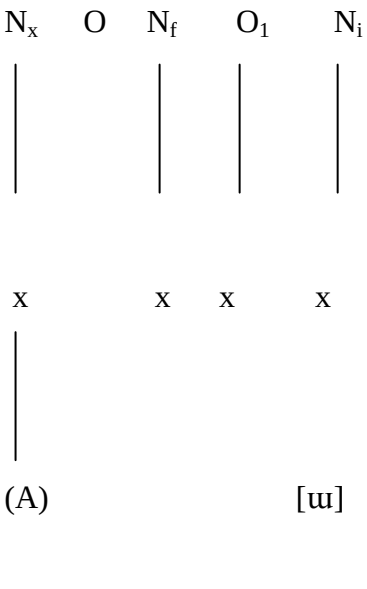
In (12a) above N_f and N_i both contain a lexically specified element (A), this element is combined with the element I in N_i, where I is interpreted due to harmony facts, however the element U combined with the element A in N_i is lexically present.[157] There is an empty onset with a point intervening between these two domains, and this empty onset loses its point in quick speech. In (12b), Nf-O1 sequence is reduced from the structure through the Reduction Principle and the element U, which is in combination with the element A, spreads leftwards across an empty onset without a point to N_x. The element I, which was interpreted in N_x (12a), does not get interpretation any more. The columns in yellow (in table 10) are all of this type.

[157] Here following Charette and Göksel (1996)we assume that, initial nucleus of a domain (harmonic head) can host one of the eight melodies attested in Turkish while the non-initial nuclei can either be lexically empty or filled by element (A).

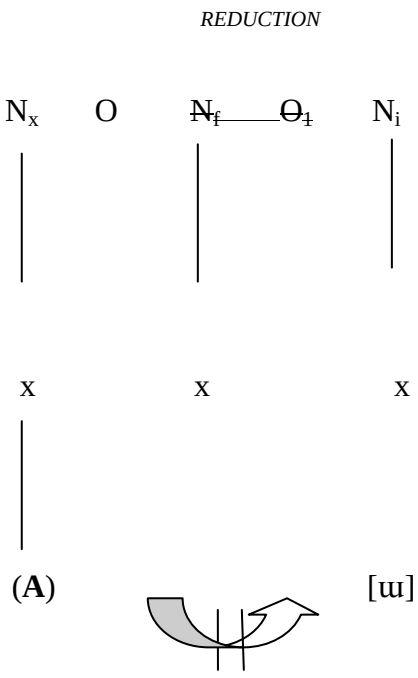
3) If N_x (is lexically filled-) contains an element A while N_i does not, either Ox is filled via spreading of the ambient elements (I or U contained in either Ni or Nx) or no change occurs.[158] Consider the representations of *havA Ilık* 'the weather is calm' and *ayA İndi* 's/he landed on the moon' (from table 11) given in the structures below.

(13)

slow speech: *hava ılık*



b) quick speech: *hava ılık*



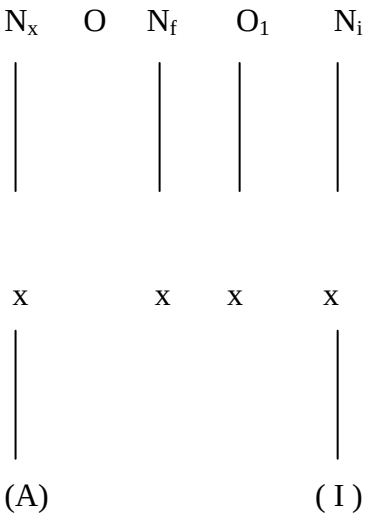
In (13b) N_x is lexically filled and N_i contains "no melody", but being an initial nucleus of the stem, it is obligatorily interpreted. Again we assume that the second domain contains an initial empty onset with a point. In quick speech version (13b) O_1 loses its point and N_f-O reduction takes place; however, the element A present in N_x

[158] The idea that an empty onset with a point is not tolerated in quick speech is similar to the case we claimed for domain internal facts. That is an empty onset with a point either loses its point or gets a melody from the local nuclei, therefore receives interpretation.

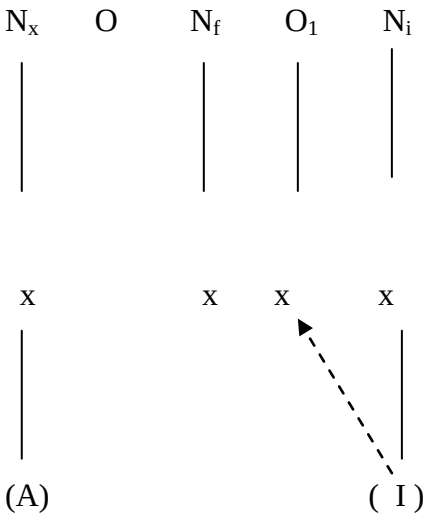
cannot spread rightwards as would be expected within domains. The reason for such a restriction may be the initial nucleus of the (second) domain which is claimed to have a privileged status in Turkish.[159]

(14)

a) slow speech: *aya indi*



b) quick speech: *ayayindi*



In (14a) N_x contains an element A which cannot spread rightwards across an empty onset without a point in quick speech due to the reasons proposed above. In (14a) we observe that the structure avoids Ox in quick speech via filling it with a melody (element I), present in $N_{i.}$ Hence we get the palatal glide interpretation in O. It has to emphasized once more that the main point here is that quick speech phonology avoids the existence of an empty onset with a point in the structure the and strategy

[159] See Chapter 2 for a detailed discussion of properties of N_i (harmonic head) in Turkish.

it prefers to do that (onset point deletion or filling onset point with a material) makes no real difference.

The examples given in the tables above reveal the following facts regarding A-spreading across independent domains:

- A spreads only across an onset without a point.
- Direction: leftwards (?) We do not have evidence whether A can really spread across domains at this point (as the environment where we predict it to spread, the spreading is blocked by the prividged initial nucleus.)
- Target: lexically empty nuclei (causing disinterpretation of the other elements interpreted in this position by vowel harmony)
- Source: A can spread leftwards from all types of combinations, namely (A), (A.I), (A.U), (A.I.U).

5.3.2 Glide Insertion= I-U Spreading

Let us backtrack and recall Kabak's claims on the hetero-syllabic V.V sequences which cannot undergo vowel assimilation. The author stated that such sequences are either resolved via glide insertion (*faiz [fa:iz] ~[fa:yiz])* or stay unchanged (*noel [noel])* depending on the quality of vowels in that particular environment. The environments for glide insertion (as described in Kabak 2007) are given below:

(15) Hiatus resolution through glide insertion

a. Palatal glide insertion: The palatal glide is inserted either when the first vowel in the V_1V_2 sequence is front or when the second one is [i]. e.g., *eğil [eil]~[eyil]* 'to bend', mühim *[müim]~[müyim]* 'important'.

b. Labial glide insertion: Labial glide insertion is claimed to take place in the environment of round vowels e.g., *soğan [soan]~[sowan]* 'onion'.

c. Velar glide insertion: A velar glide is claimed to be inserted in the environment of unrounded back vowels e.g., sığır [sɯɯr] ~ [sɯɣɯr] 'cattle'. [160]

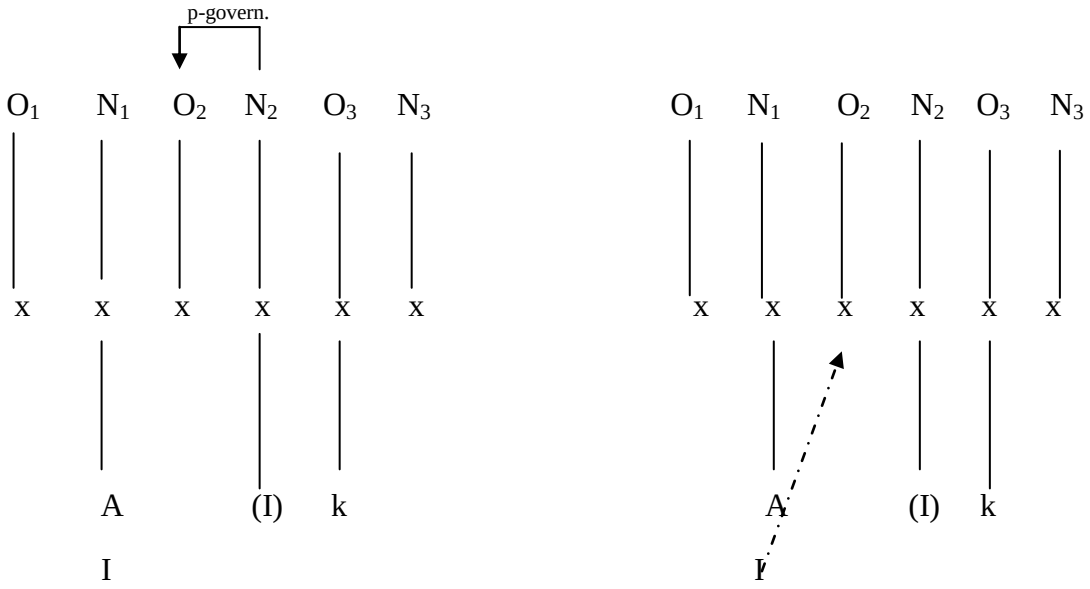
We would claim that optional cases where glide insertion is assumed to take place (in casual speech) should be treated in terms of element spreading/interpretation required by avoidance of Ox in the structure by casual/quick speech phonology. This claim will be elaborated on later. In what follows we will state how the so called " glide insertion" should be understood in terms of GP, then we will present the possible structures for the optional forms e.g. [soan]~[sowan] 'onion' and discuss the attested ones in detail.

[160] The velar glide option we came across only in Kabak (2007:1381) who claims that for him and his informants such a realization is attested only in careful speech. We also have to note that in our dialect " velar glide" is not an option.

5.3.2.1 Palatal Glide Insertion = I-spreading

(16) *eğik* *[eik]~[ejik]* 'bent'

(a) *option # 1:* careful speech (b) *option #2:* casual speech



It has been claimed by Kabak (2007) that in the V.V sequence which cannot undergo vowel assimilation the palatal glide is inserted between these VV sequences either when the first vowel in the V_1V_2 sequence is front or when the second one is [i].[161] In GP terms we may translate this formulation as follows, considering the two nuclei surrounding an empty onset with a point, such as N_1 and N_2 in (16a) above, the element I can spread into Ox only if:

[161] Those conditions are subject to further discussion, as it seems that the other phonological processes in Turkish, such a vowel epenthesis, do not confirm to the fact that the element I cannot spread leftwards from complex expression, consider a word like st(U.I)dyo ~ s(I.U)t(I.U)dyo where the element I is able to spread leftwards from a complex expression. (The example is taken from Baturay 2008.)

i) *N_1 contains element I*

or

ii) *N_2 contains (a lexical) element I as a simplex expression*[162]

Therefore a word like neon can have two optional variants [neon]~[nejon] while a word like noel can be pronounced only as [noel] in both careful and casual speech as illustrated below:

(17) careful speech casual speech

(a) n(A.U)(A.I)l [noel] *n(A.U)(I) (I.A)l *[nojel]/[noel]

(b) n(A.I)(A.U)n [neon] n(A.I)(I) (A.U)n [nejon]

As is shown in (17a) above, the element I is banned from spreading leftwards (here the target of spreading is an empty onset with a point like O_2 in (20a above) from a complex expression (A.I) in casual speech, therefore *[nojel]* is claimed to be ill-formed. On the other hand in (17b) the element I spreads rightwards from a complex expression and we get *[nejon]* as a casual speech version of *[neon]*.[163]

Accordingly, as for the structures in (16a-b), we assume that in (16a) *eğik [eik]* is the careful speech version where N_2 being a realized nucleus properly governs the immediately preceding onset with a point (O_2) and the melody hosted by

[162] We have to note that the second condition should be valid only for those forms which have a lexical element I in their composition such as in *dair [dair]~[dajir]*.

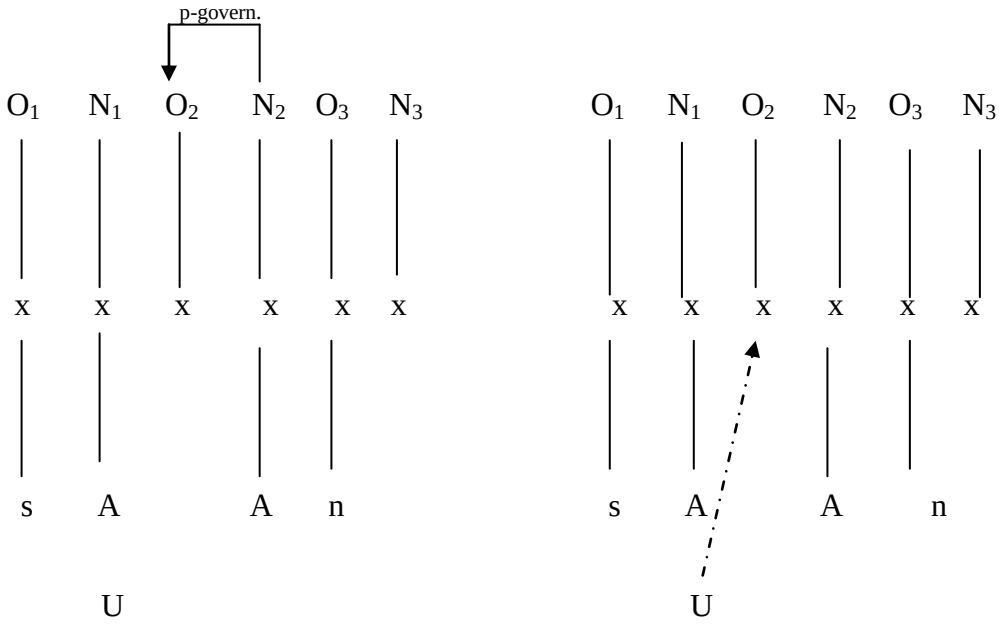
[163] We have to note that both [nejon] and [nojel] are fine for us, also they sound equally weird when [j] is prominently articulated. Compare the [j] [*nejon] and [nojel]* with this sound in words like *ga[j]et* 'quite'.

N_1 and N_2 cannot see each other due to this intermediate Ox. (16b) is the quick speech version of the form in (16a), here we assume that an empty onset with a point cannot be tolerated in quick speech, thus it gets the interpretation of an element I (palatal glide) from N_1.[164]

5.3.2.2 Labial Glide Insertion= U spreading

(18) *soğan* *[soan]~[sowan]* ‘ onion’

(a) *option # 1:* careful speech (b) *option #2:* casual speech



A labial glide is assumed to be inserted in the environment of round vowels, eg., *soğan [soan]~[sowan]* ‘onion’. In GP terms, whenever we have an element U, it can spread to an empty onset with a point either rightwards or leftwards (in quick/casual speech). Consider the structures in (18a-b): In (18a) an empty onset with a point (O_2) is properly governed by an immediately following realized

[164] It has been mentioned before that quick speech phonology avoids Ox’s either via deletion of the skeletal point or filling this empty slot with an ambient melody.

nucleus while in the quick speech version (18b) an element U hosted by N_2 spreads rightwards into this empty onset and is realized as labial glide [w]. The spreading of element U in this environment can be considered to take place to satisfy quick-speech requirements of avoidance of Ox in the structure, as has already been mentioned for I-spreading. Kabak (2007) proposes that words like *oğul [oul] ~[o:l]* ' son' can undergo V-assimilation and are not subject to glide epenthesis. We also have shown that in such words an empty onset loses its point and the element A can spread across an empty onset with a point rightwards:

(19)

slow speech	casual speech
(A.U)ğ(U)l *[oul]*	(U.A)ğ(U)l *[o:l]*

However according to the *Minimalist Hypothesis*[165], one may wonder why in a word like oğul (A.U)ğ(U)l the element U does not spread into an empty onset with a point in quick speech resulting in [owul], but why instead the skeletal point of Ox is deleted. Well, at this point we can only speculate on this choice, saying that maybe whenever there is an element A dominated by a nucleus preceding a sequence of Ox and lexically empty nucleus, the skeletal slot of Ox must be deleted.That is, the skeletal slot of Ox and the element A present in that particular environment may somehow be interacting.

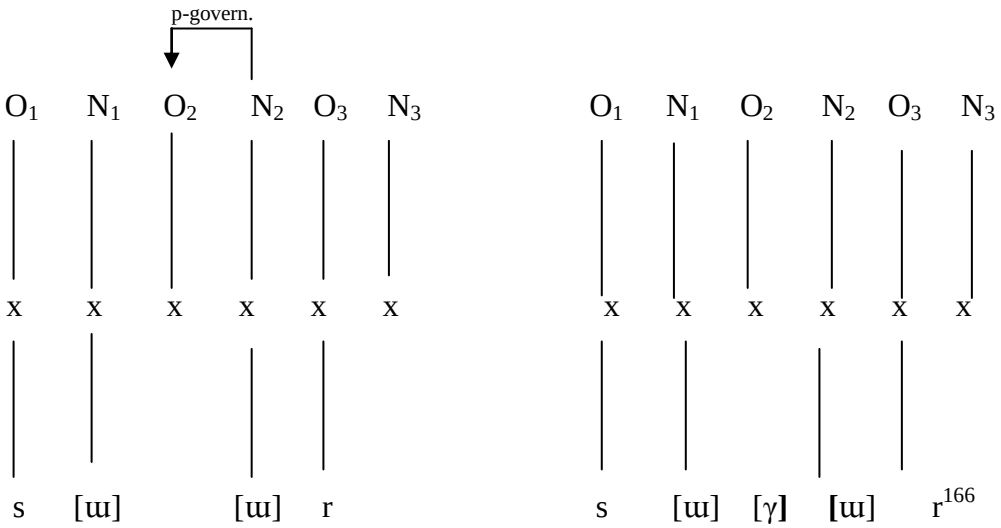
[165] The Minimalist Hypothesis: "Processes apply whenever the conditions that trigger them are satisfied" (Kaye 1995:291).

5.3.2.3 Velar Glide Insertion: Interpretation of ( )

Finally consider the velar glide insertion claimed to occur in the environment of back vowels which are not rounded e.g. *sığır [sɯɯr] ~ [sɯɣɯr]* 'cattle'. The structure in (20) below illustrates whether this type of insertion fits into GP:

(20) *sığır* *[sɯɯr] ~ [sɯɣɯr]* 'cattle'

(a) *option # 1:* careful speech (b) *option #2:* casual speech



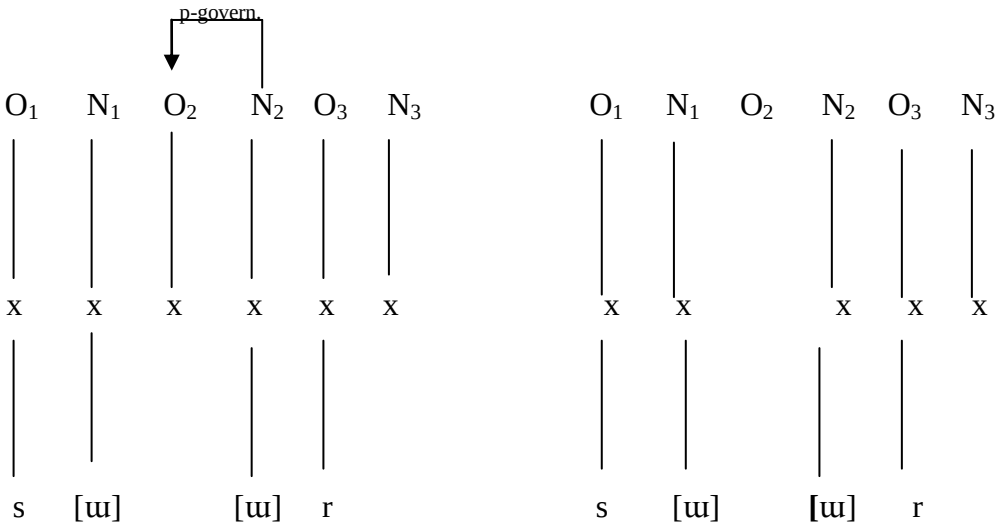
In (20a) above an empty onset with a point is p-governed by an immediately following nucleus (N_2) which contains an empty melody interpreted as [ɯ] in Turkish. In the quick speech version (20b) on the other hand, an empty onset with a point is interpreted as a velar glide [ɣ]. The trigger of interpreting an onset with a point in this environment can be the fact that Ox is not tolerated in the structure in quick/casual speech. As has already been noted we do not have such a form in our

[166] A non-p-licensed syllabic constituent (Onset or Nucleus) with a skeletal point indicates a constituent dominating an interpreted empty melody.

dialect. For us *sığır* would have the following representation in careful and casual speech respectively:

(21)

a. *[sɯɯɯr]* careful speech b. *[sɯ:r]* casual speech



(21a) and (21b) vary only in that the former includes a properly governed empty onset in its structure while in (21b) this empty onset loses its point. Here we can observe how the structure is significant in determining the (phonetic) realization of two successive nuclei. In particular, it is the presence of Ox which gives an impression that there are two separate vowels, in casual speech form of *sığır* [sɯɯ́r], where the second one is more prominent being stressed. In (21b), on the other hand, the absence of Ox entails articulation of one single sound which, being interpreted in both nuclear positions, calls for a long vowel realization [ɯ:].

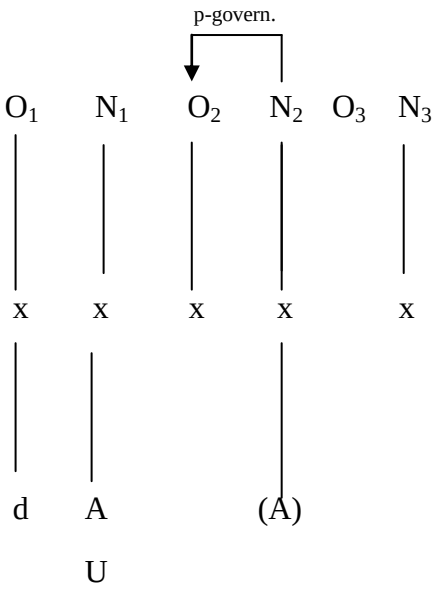
5.3.2.4 More on O/Ox resolution in quick speech

The (optional) glide insertion processes stated in Kabak (2007) have been discussed in terms of element spreading in order to avoid *Ox* in GP structure. In what follows, we will give further examples on Ox/O resolution in quick speech and we will question how much these options are attested and whether they are attested at all.

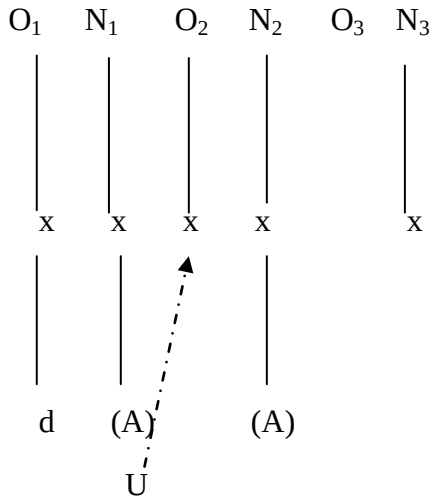
In the structures below we use the word *doğa* 'nature' to exemplify possible processes taking place word medially where Ox is attested, keeping in mind that quick speech phonology disfavors Ox in the structure.

(22)

(a) [doa] careful speech



(b) [dowa] casual speech



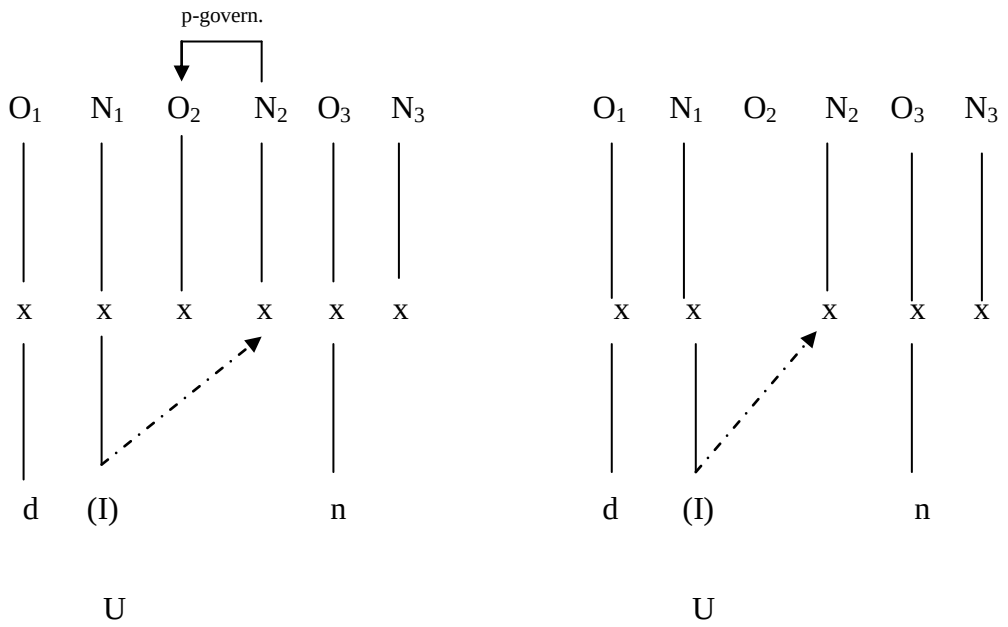
In (22a) O_2 is a lexically empty onset and is p-licensed via p-government by N_2 (a realized nucleus). In (22b) Ox gets melody (the element U in this case) from N_1 through interpretation. This way Ox is prevented from staying in the structure in casual/quick speech. One may wonder about the difference between an element U

lexically associated with an onset position and (a derived) element U obtained through spreading/interpretation as is illustrated in (22b). In particular, can we determine/perceive the difference—if there is any—in the melody dominated by O_2 in a word like *kova* 'bucket' (where its lexically present) and a word like *doğa* 'nature' (where it is assumed to be derived) in casual speech. Well, this is not quite easy to test, one way can be to pronounce both words quickly with high prominence on each sound. When such a test is conducted, some informants reported that [v] in *[dowa]* when articulated with "high prominence" sounds somewhat incomprehensible or weird, while others reported that it is " well-formed" also in comparison to [v] in *kova* where it is as perfectly accepted as in regular (careful) speech by everyone.

There are also some cases where we may find three possible options of a single word, for instance consider casual and careful speech variants for a word like *düğün* 'wedding' as exemplified below:

(23) düğün [dyyn] *careful speech* [dy:n]~[dyjyn] *casual speech*[167]

(a) [dyyn] *careful speech* (b) *option #1:* [dy:n] *casual speech*



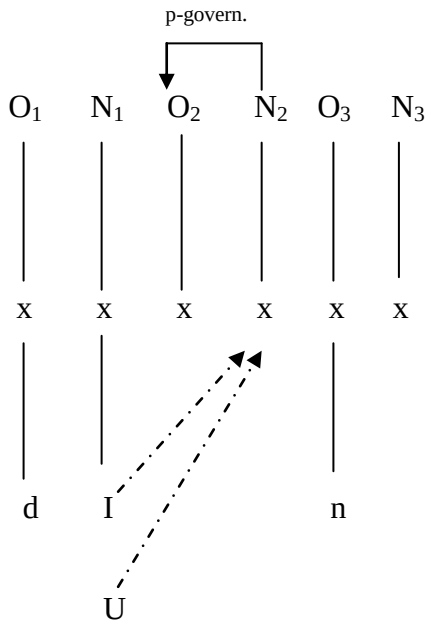
We consider that *[dü:n]~[düjün]* can occur in free variation in quick speech. The theory does not have much to say on the preference of one over another. It may be some other factors style, context etc. which is at play in deciding the one or the other option in quick/casual speech.

Regarding the structures in (23a-d), in (23a/c) an empty onset with a point is p-governed by N_2, while in quick/casual speech this empty onset is either preserved in the structure and gets interpreted (via I spreading/interpretation) from N_1as in (23d) or gets lost giving rise to a realization of (U.I) associated to two skeletal points. Therefore we get a long vowel as is shown in (23b). Both processes should be considered as Ox avoidance strategies in quick/casual speech phonology.

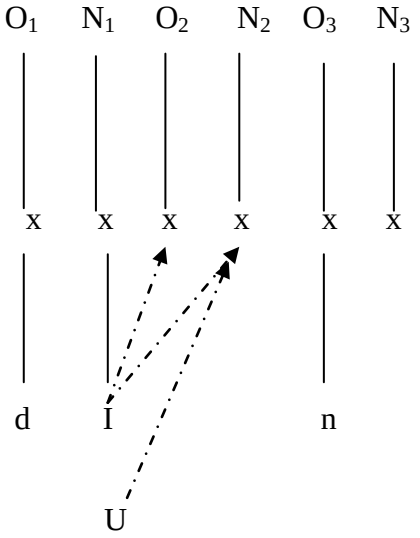
[167] Note that something like [düʏün] is not acceptable where the element U is interpreted together with I in the empty onset position of the quick speech version.

(23)

(c) [dyyn] careful speech



(d) *option #2:* [dyjyn] casual speech



We also have to note that in the düğün [düjün] verison it may well be the case that the [j] in that particular word does not really have a phonological significance[168]. In other words it may be the case that due to co-occurrence of many element I's in N_1 and N_2 as is shown in (23a/c) the speakers of Turkish may be deceived by such co-occurrence and may end up saying that they hear "a palatal glide" in O_2 position not producing such a structure at all. Also, the effect of the literature bombarding the idea that two vowels cannot stay next to each other therefore a glide has to be inserted between them should not be underestimated. To give a more reliable explanation of the attested versions of the V.V sequences in quick/speech detailed

[168] " Since j has very high second and third formants (F2 and F3 respectively), and so do front vowels the dynamics of F2 and F3 change from a front vowel to a palatal glide is not easily detectable" (Kavitskaya 2001:43).

perception tests should be conducted which is beyond the primary objectives of our study and is subject to further research.

To recapitulate the facts discussed in this chapter, we have claimed that it is the presence or absence of an empty onset with a point in the environments previously identified as V.V sequences which determines the optional vowel coalescence, vowel assimilation and glide insertion observed in casual speech in Turkish. Moreover we have showed that element A, which was claimed not to take place in spreading in Turkish, can spread across an empty onset without a point to a lexically empty positions. We have identified the direction of this spreading both within and across domains. We have also discussed the optional variants of forms like *düğün [dyyn]* 'wedding' we have in quick speech and suggested the reasons for having such optionality.

CHAPTER 6

AYAK TYPE WORDS

A FRESH LOOK AT K~Ø ALTERNATION

6.1 Introduction

Another environment where one can observe domain medial empty onset(s) is a number of words in Turkish which undergo k~ø alternation word finally when a vowel initial suffix is attached to them. These words will be referred to as *ayak type* words from now on. Below first we will give the definition of k~ø alternation, then we will provide the examples and counterexamples to this alternation.

(1) k/ø alternation[169]

Alternation "in the morpheme-final position, whereby a final post-vocalic k shows up as ø before vowel initial suffixes, in certain words" (Sezer 1981: 355).

These words consist of a small number (only three) of monosyllabic and most of the polysyllabic (bisyllabic) nominal stems. Consider the examples given in (2) below:

[169] Also note that a consonant initial diminutive suffix {-CIk} also causes word final k to get deleted (only in adjectives), e.g., *küçük [kytʃyk]* 'small' – *küçücuk [kytʃydʒyk]* 'very small'. This process is considered to be morphologically conditioned.

(2)

(a) Polysyllabic nominal stems

	Nominative		Accusative		Gloss
a.	*ayak*	*[ajak]*	*ayağı*	*[ajaɯ]*	‘foot’
b.	*bebek*	*[bebek]*	*bebeği*	*[bebei]*	‘baby’
c.	*öksürük*	*[øksyryk]*	*öksürüğü*	*[øksyryy]*	‘cough’
d.	*mezarlık*	*[mezarlɯk]*	*mezarlığı*	*[mezarlɯɯ]*	‘ grave yard’

(b) Monosyllabic nominal stems

	Nominative		*Accusative*		*Gloss*
a.	*gök*	*[gøk]*	*göğü*	*[gøy]*	‘sky’
b.	*çok*	*[tʃok]*	*çoğu*	*[tʃou]*	‘ a lot’
c.	*yok*	*[jok]*	*yoğu*	*[jou]*	‘nothing’

There are a number of other environments where words ending in [k] do not undergo k~ø alternation. At this point, not yet having determined the nature and generality of this alternation, we would not call these environments exceptional. Consider the data given below in (3):

(3) No k~ø alternation [170]

a. Most monosyllabic words: *[ek]* 'affix' - *[eki]* 'affix-3SG.POSS.'

b. Some (bisyllabic) loans: *[tahakkuk]* 'verification'- *[tahakkuku]* 'verification- 3SG.POSS.'

c. Verbal stems: *[gedʒik]* ' be late'- *[gedʒikijor]* ' be late-PROG.'

d. Following a long vowel: *[merak]* 'curiosity'-*[mera:kɯ]* 'coriosity-ACC.'

e. Before non-native suffixes: *[mantɯk]* 'logic'- *[mantɯki]* 'logical'.

f. Following verbal auxiliary suffixes (ol-,et-): *aşık ol [aʃɯk ol]*- but aşığı *[aʃɯɯ]*

g. In proper names (careful speech): *Konak-ın, Başak-ı, Çiçek*.[171]

As can be seen in the list above k~ø alternation is not applicable in most monosyllabic words, some bisyllabic nominal stems, before non-native suffixes and in proper names (optionally). In what follows we will give a brief survey of previous views on the phenomenon and we will discuss how those analyses handle the process of alternation and the environments where it seems to be inapplicable.

[170] Note also that recent borrowings from European languages e.g., *frikik [frikik]* ' free kick' tend to lose their final k's in vowel when a vowel initial suffix is attached to them e.g., *frikiği[frikii]/frikiki [frikiki]* ' free kick-ACC.' (Zimmer 1978:37).

[171] The data is taken from Sezer (1981) and Denwood (2002).

6.2 Literature Review

6.2.1 Linear Analyses

6.2.1.1 Lees (1961): k/ø alternation as g-deletion

Lees assumes that a set of forms such as *ayak* 'foot', *inek* 'cow', *çok* ' a lot' have word final underlying /g/ or /ɣ/ in their representation. This phoneme is considered to be either devoiced in word final position to /q/ or /k/ or deleted when one of these words undergo vowel initial suffixation. Consider the underlying and surface representations of the words below in (4) as they are given by Lees[172]:

(4)

	S.R	U.R	S.R	U.R	
	Nominative		3SG.POSS.		Gloss
a.	*ayaq*	*/ayaɣ/*	*aya-ı* =	*/ayaɣ-sı/*	'foot'
b.	*çoq*	*/çoɣ/*	*ço-ı* =	*/çoɣ-su/*	' a lot'
c.	*inek*	*/inek/*	*ine-ı* =	*/ineg-si/*	'cow'

As can be seen in (4) above, Lees assumes that /ɣ/ devoices to [q] and /g/ devoices to [k] in word final position of nominative forms. However, when the third person singular possessive suffix {-(s)I(n)} is attached to these forms, it is assumed that first the buffer (-s) of the suffix is deleted after the (now intervocalic) voiced /ɣ/ or /g/ is

[172] S.R (surface representation); U.R (underlying representation); /q/ voiceless mid or back velar stop; /ɣ/ voiced mid or back stop. It has to be noted that Lees borrows a number of symbols from Turkish orthography to represent surface pronunciations of the utterances e.g., ı corresponds to [ɯ] in IPA.

elided from the representation (through a g-deletion rule as Sezer 1981 calls it).[173] This ordering relation is of extrinsic nature. That is, (-s) deletion is pre-specified to take place before /γ/ deletion. In other words it isn't a natural relationship which falls from the well-formedness of the derived representation but is constructed in such away. One can equally claim that (-s) deletion takes place after /g/ deletion and there is nothing in the representation to tell us which ordering relation better generates the attested form.

Lees does not say much about the predictability of g/γ-deletion, the author assumes that all the other forms end in k, which therefore don't do g-deletion. He only describes the forms which undergo such alternation as a number of noun morphemes not giving further details. The author has been criticized for such a position by a number of scholars such as Zimmer (1975). Zimmer puts forward that k/ø alternation is not unpredictable as was suggested by Lees, but rather it is quite regular in polysyllabic stems than in monosyllabic ones which means that this process pays attention to the number of syllables in the word. Moreover, Zimmer claims that Lees' analysis is too abstract in that it doesn't reflect native speakers' pronunciation where there are no word final /g/'s on the surface.

Lees gives a short descriptive sketch on the k~ø alternation, it is significant in being the first analysis of the process and in inspiring the later studies. However, as has been discussed above and emphasized by Zimmer (1975), Lees' suggestion does not give one a full picture of the process and the environments it applies/ doesn't

[173] Lees may have two independent reasons to prefer such an ordering : i) the choice of the form of the suffix, that is it is the underlying consonant/g/ which denotes the choice of vowel initial suffix leading to s-drop. ii) a(separate) voiced velar softening rule which assumes that post vocalic velar stops have to be reduced phonetically followed by vowel initial suffix(es): VG+→Vğ+ (Lees 1961:52)

apply in, not even in a descriptive sense, and also it generates further problems, e.g. an extrinsic ordering relation.

6.2.1.2 Zimmer (1978): k/ø alternation as k-deletion

Zimmer assumes that the k~ø alternation is a predictable process, counter to Lees. His proposal to account for the regularity was to assume that in all stems having morpheme final post-vocalic obstruents, there is /k/ in their underlying representation, which is deleted (depending on the number of the syllables in a stem) when a vowel initial suffix is attached to them. The formulation of this is given by the following rule:

(5) $k \rightarrow ø / V\ C_o\ V _____{}_+\ V$

Zimmer further gives experimental evidence claiming that a rule in (5) which requires a close correlation between polysyllabic vs. monosyllabic stems and morphemes where [k] does and does not alternate, is internalized by the native speakers of Turkish. The results of the two tests conducted with native speakers to determine the behavior of word final k's in made-up monosyllabic and polysyllabic words (which resemble native words and Arabic borrowings) were consistent in showing that subjects prefer to drop final k's in polysyllabic stems rather than in monosyllabic ones. Accordingly, the author gives these results as a support for the psychological reality of the k~ø alternation claimed to be present in the phonology of Turkish.

Zimmer's analysis (1975/78) is important in being the first study to determine the regularity of k~ø alternation in polysyllabic stems. However, it ignores a number

of contexts where k/0 alternation does not take place as would be predicted by the rule in (5), e.g., in the behavior of verbal stems in vowel initial suffixation.

6.2.1.3 Sezer (1981): k/ø alternation as (a revised) k-deletion

Sezer, following Zimmer, suggests that in Turkish all nominals having the shape of CVCVk, when appended with one of the 6 suffixes (given under X), delete their final voiceless velar plosive, as indicated in the revised version of *k-deletion rule* below:

(6) A revised version of k-deletion rule

$$\begin{bmatrix}\text{-sonorant}\\ \text{-coronal}\\ \text{-labial}\\ \text{-voice}\end{bmatrix} \longrightarrow \text{Ø} \quad / \; [+\text{syll}]\, C_o \begin{bmatrix}\text{+syll}\\ \text{-long}\end{bmatrix} _____ + \begin{bmatrix}\text{+syll}\\ \text{X}\end{bmatrix}$$

X:

Copula:	'1SG.': -Im, '1PL': -Iz
Possessive:	-Im, -In, -I(n), -ImIz,- InIz
Accusative:	-I
Dative:	-E
Resemblative:	-ImsI/-Imtırak

Sezer claims that the solution he proposes does not refer to any lexical and morphological exceptions and generalizes all the possible environments for k~ø alternation. It seems that the author tries to avoid exceptions at the cost of putting all morphological conditioning factors into X. Moreover, there are (a number of)

monosyllabic words which are not captured by Sezer's rule but still undergo k~ø alternation e.g., *gök, çok, yok,* which means that his rule still has a number of exceptions.

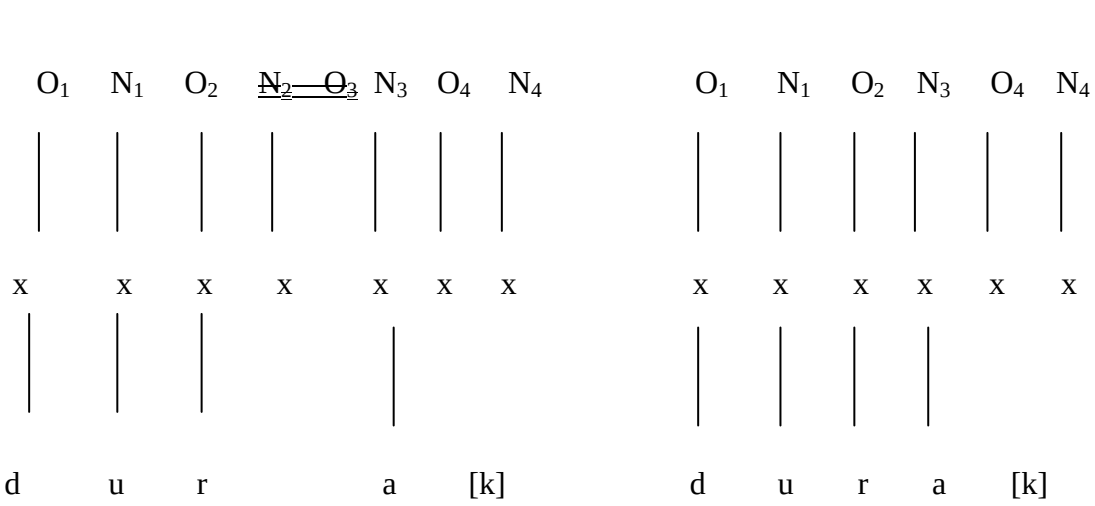
6.2.2 Non-linear analyses : Government Phonology

6.2.2.1 Denwood (2002): k/ø alternation , conditioned by p-licensing of an empty onset

Denwood's analysis of k/ø alternation is the first one to analyze this phenomenon in the GP framework. The author claims that [k] which alternates with zero in Turkish (in word/domain final position), is the interpretation of an empty onset whose peer nucleus cannot properly govern it. Consider the structures in (6a-b) below:

(7)

(a) *[dur] + ak* (b) [durak] 'stop'

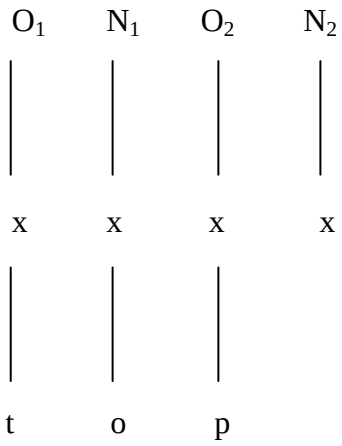


Denwood assumes that words in Turkish occupy a four position template (ONON). The first template is considered to be the stem template and the other templates are suffix templates, the conditions for which were already given in chapter 4 and are restated below:

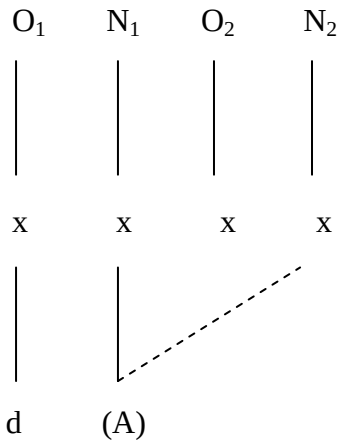
The stem template: A minimal word or stem in Turkish is considered to occupy a four position template in which either the onset or the nucleus of the final ON pair has to be interpreted. Consider the representations of *top* 'ball' and *dağ* ' mountain given below:

(8)

(a) *top [top]* 'ball'



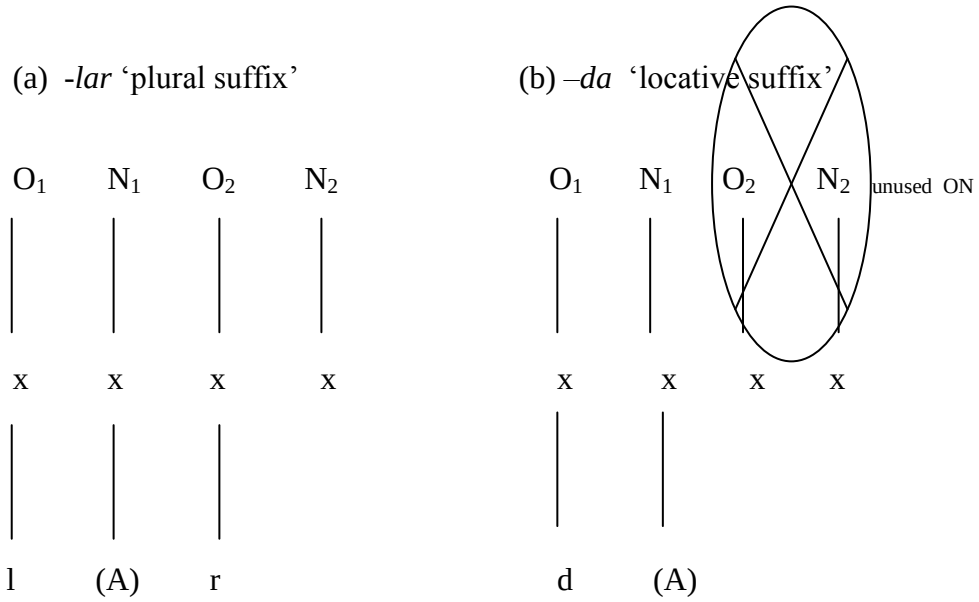
(b) *dağ [da:]* 'mountain'



The suffix template: This is considered to be a dependent template. This template does not have to use its final ON pair as opposed to the stem template. That is the final ON pair of the suffix may not host any melody. Hence can be empty. Whenever we have such an empty and unused ON in the suffix template, it is subject to reduction from the structure. Consider the representation of two suffix templates

occupied by the plural suffix {–lAr} and the locative suffix {–dA}, respectively, in (9) below:

(9)



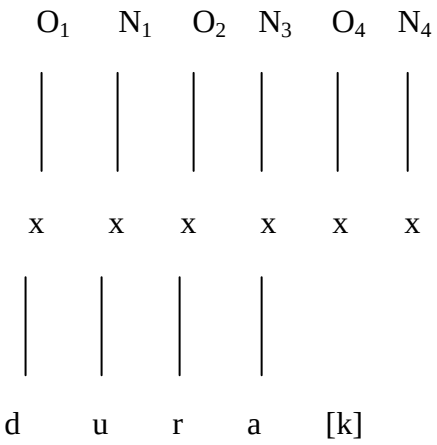
Going back to the structure of durak in (7), Denwood proposes that it should be considered to consist of a stem and a suffix template, as the author's basic assumption is that any (minimal) stem template in Turkish has to be composed to two ON pairs and either O or N of the final ON can be interpreted but not both.

As is shown in (7a) *dur-* occupies the first (stem) template while *–ak* occupies the dependent/suffix template. It is assumed that N_2 (an empty nucleus) followed by an onset without a point O_3 is reduced from the structure as is predicted by Reduction Principle.

Now, as is depicted in (7b-also given below in 10) ,the final onset of the suffix template which is empty and cannot get license from the following empty nucleus (being empty this nucleus cannot serve the role of proper governor for the

preceding empty onset cf. proper government) stays as such and gets interpreted as [k].

(10)



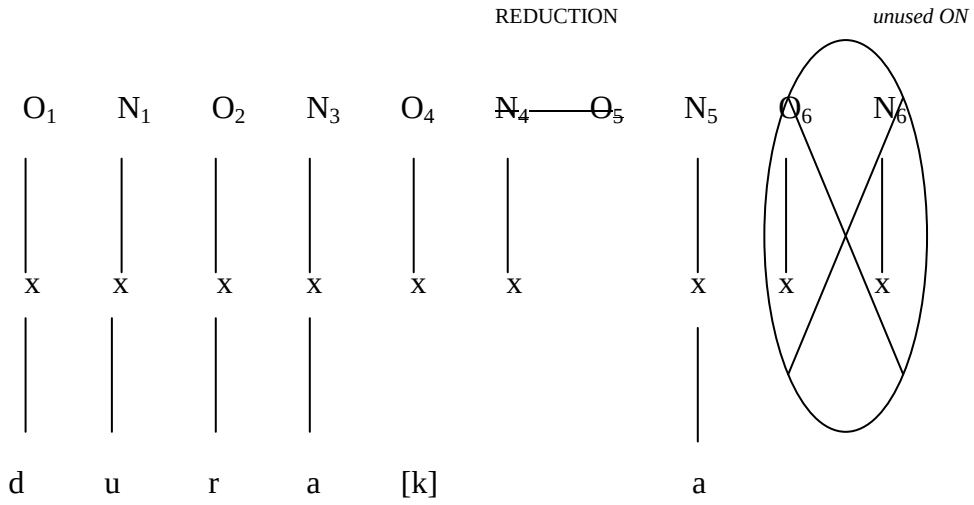
To recapitulate Denwood's assumptions, she assumes that word final [k] in a bisyllabic word like durak belongs to the suffix and it is an interpretation of an empty onset which is not p-licensed by the following nucleus to stay silent. The very first reaction to this proposal may be to ask what prevents this final empty onset to be reduced from the structure together with its peer nucleus as being unused. In fact, this is what we expect from the final ON of the stems (cf.stem template above). In particular, if [k] is the interpretation of a final empty onset which belongs to the suffix, what prevents it from being interpreted in the final onset position of the locative suffix {-dA} for instance leading to **(–dak)* or **(–dek)?* Denwood refers to these forms as regular, but if they are so regular shouldn't we get the [k] interpretation whenever there is an empty onset position in the structure which is not p-licensed? In a way, Denwood's presumption seems to be that certain forms are

marked in the sense that their empty onsets can be interpreted as [k] when not given license to stay silent.

Now let us see how such forms behave in vowel initial suffixation according to Denwood. Consider the dative form of durak (Denwood 2002:92) as it is given in (11) below:

(11)

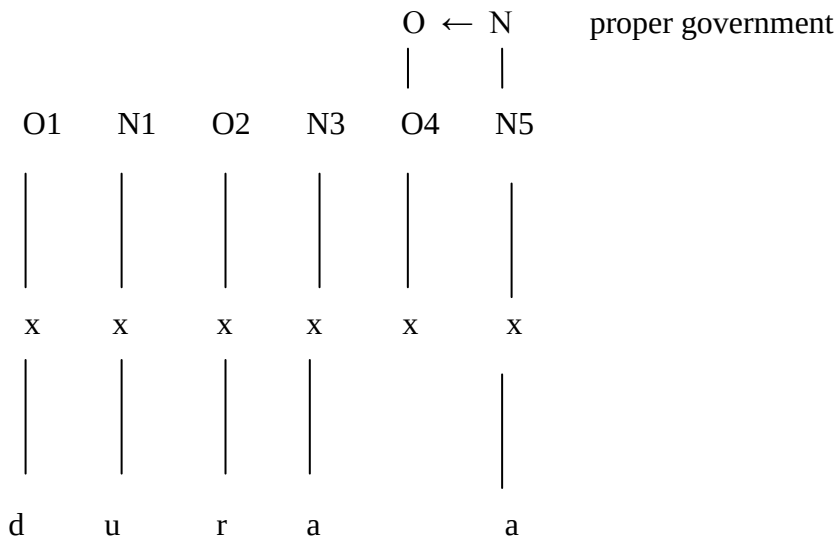
a. *[durak] +a*[174]



As can be observed in (11a), it is assumed that N_4 (an empty nucleus) followed by O_5 (an empty onset without a point) are deleted from the structure via Reduction, also O_6N_6 of the suffix template (dative) are deleted as it is unused. In the final representation O_4 is followed by N_5 (a full nucleus) which is a potential proper governor for the preceding empty onset with a point.

[174] The numbering of ON are preserved while we have showed reduction (s) in the structure (for the purposes of clarity) .

b. *[duraa]* ‘stop-DAT.’



In (11b) the final structure after the derivation is depicted. Now N_5, which hosts the melody of the dative suffix (A), properly governs the empty onset with a point to remain silent, which would otherwise be interpreted as [k].

Denwood (2002) also addresses three environments, determined by Sezer (1981), where k~ø alternation fails to take place. These are most monosyllabic words *(ek-eki)*, some verbal morphology (*bırak-bırakacak*) and following a long vowel *(merak-merakı)*.[175] The author explains exceptions to k/ø alternation by referring to the special status of the stem or suffix template that these words are assumed to be

[175] Note that Denwood (2002) deals only with certain environments where k/ø alternation is claimed to be inapplicable, consider the data in (3) for further environments.

connected with. In particular, it is the privileged status of monosyllabic stems like *ek*, the structure of certain suffix stems in verbal morphology and the occurrence of three adjacent nuclei in words like *[mera:kɯ]* which prevents domain final [k]'s from being deleted. We are not going give the details of those proposals but the most significant point about them seems to be their descriptive nature. Or rather, from the explanatory point of view, saying that a process does not apply in a certain environment because of the 'special' properties of that environment does not match the premises of The Minimalist Hypothesis: "Processes apply whenever the conditions that trigger them are satisfied" (Kaye 1995:291), which should be taken into consideration while explaining a phonological event in Government Phonology. Shortly, Denwood claims a different structure for different behavior. Therefore she gets a circular argument.

Moreover, a proposal where k's are not deleted in certain environments due to special conditions on the stem/suffix template would lead one to ask why the stem/suffix template is so special, the answer to which seems to be that it is constructed in such a way that k/ø alternation does not apply there. Such a position, for sure, buys one a circular argument which is something we do not want to get in the borders of an explanatory theory.

6.2.2.1 Balcı (2006) k/ø alternation , as element fortition/lenition

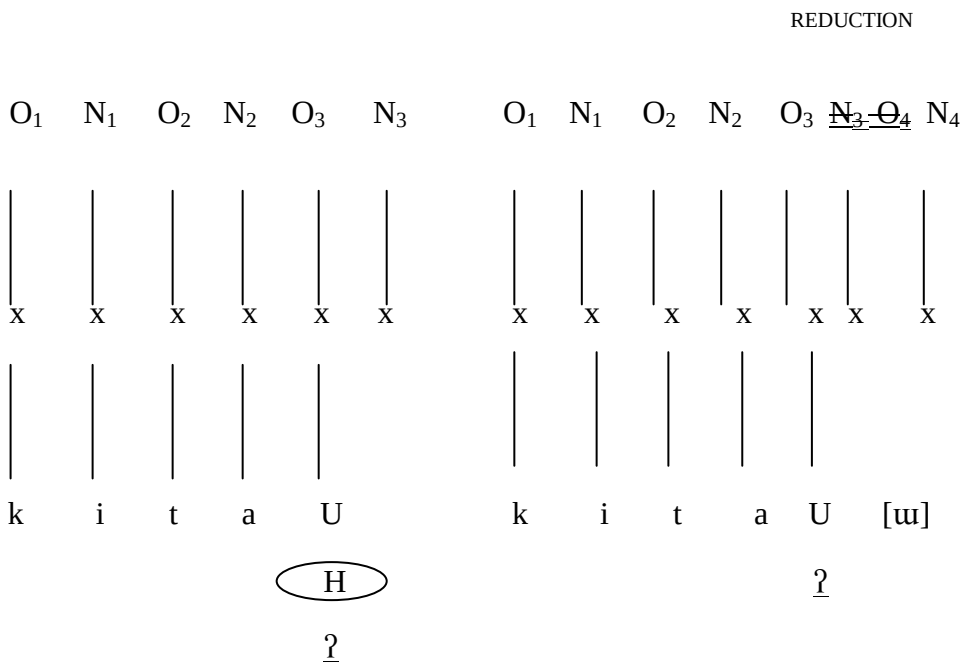
Another account of k/ø alternation in Turkish is proposed by Balcı (2006:81), even though discussed not extensively, the author claims that this alternation is related to voicing alternations and can be accounted for by fortition. Before presenting this account, let us provide a short summary of the processes Balcı assumes to take place in the word final voicing alternations in Turkish, as [p] alternating with its

voiced counterpart [b] in *kitap [kitap]* ‘ a book’ –kitabı [kitabɯ] ‘ book-ACC.’

Consider the structure of both forms given in (12a-b) below:

(12)

(a) *kitap* *[kitap]* (b) *kitabı* *[kitabɯ]*



Balcı, following Goh’s (1996) template analysis and Harris’(1992,1997) Licensing Inheritance, assumes that at there is an asymmetry in strength between domain final Onset and Nucleus in words ending in an empty nucleus following (voiced) plosives (O_3 and N_3 in 12a). That is, if O_3 is strong, N_3 should be weak, and if N_3 is weak, O_3 should be strengthened.[176] Furthermore, it is assumed that O_3 which dominates a headed stop element (ʔ) remains weak without an element H. According to those

[176] The strength of the positions is determined by their a-licensing power (their ability to license their melodic components) and elemental composition.

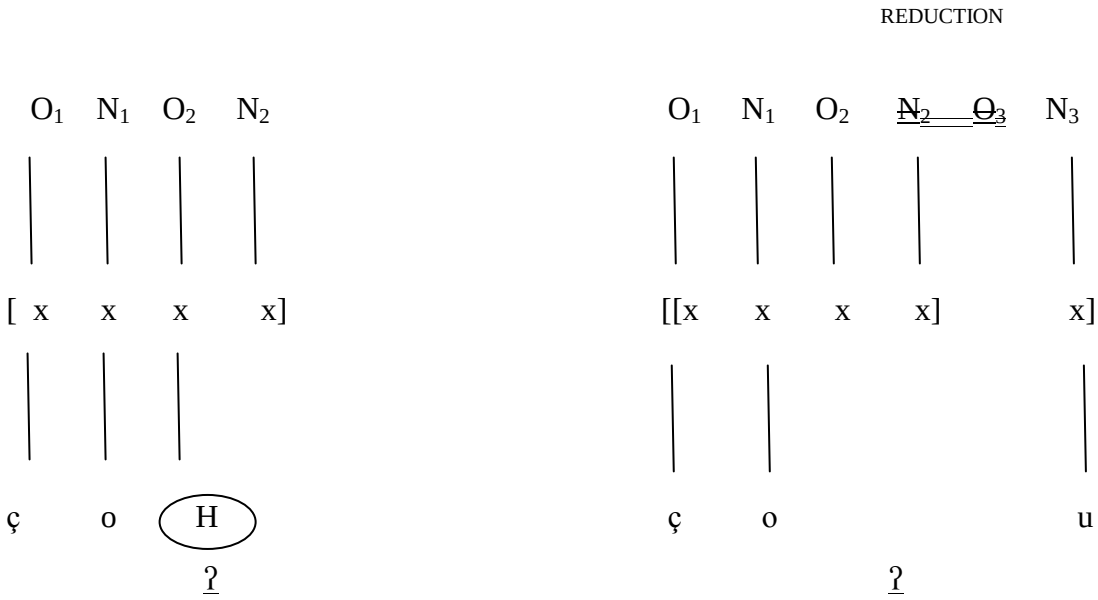
assumptions, a final segment in a word like kitap is considered to have the composition of (U. ʔ) underlyingly, which corresponds to [b]. In such a case both the empty nucleus (N_3) and O_3 where ʔ occurs without the support of H are weak. However as both O_3 and N_3 cannot remain weak, (where N_3 is considered to be a domain final nucleus which is p-licensed through parametrical p-licensing parameter which is turned ON in Turkish), O_3 is fortified by element H (circled in 12a).

In (12b) a vowel initial suffix (accusative) is attached to the stem, N_3 and O_4 are reduced from the structure through Reduction and the final nucleus of the domain is realized. Now it is assumed that, as the final nucleus (N_4) is realized hence strong, its onset peer 'can' be weak, therefore there is no need to strengthen O_3 (by H-fortition) which is interpreted as [b].

Like the voicing alternation, the alternation of k with zero is assumed to take place in form of H fortition as is depicted in the structure for nominative and accusative forms of *çok* in (13a-b) given in Balcı (2006: 81):

(13)

(a) *çok [tʃok]* ‘many’ b) *çoğu [tʃou]* ‘many-ACC.’



In the representation of çok ‘many- NOM’ (13a) above it is assumed that ʔ is not attached to the skeletal point, since O_2 and N_2 are both empty and weak. Given that there should be an asymmetry relation between O_2 and N_2, and that N_2 is the final nucleus of the stem which is parametrically licensed to remain silent, it is assumed that the only way to construct this asymmetry relation is to strengthen O_2 by fortition with the element H (in 13a). In (13b), on the other hand, N_3, which follows O_2 after the reduction of N_2 and O_3 from the structure, is realized and therefore strong, so O_2 does not have to get strengthened (can remain weak) and gets no interpretation.Moreover the author considers cases where the k/ø alternation does not apply such as *çok-uz* ‘ many- 1 PL.’ as cases of non-analytical morphology, where the internal structure of the domain is not visible to phonology.

There are a number of points regarding Balcı's analyses of both voicing k/ø alternation which deserve criticism.[177] We are not going to discuss all the details due to space considerations, but only the most significant points which are related to both processes will be briefly discussed below.

First, the fact that a weak onset should be strengthened with the element H which is not present in local environment, seems to be problematic. In particular in Government Phonology one of the main assumptions is that if there is an element that is added, it must come from the environment. However, in Balcı's account of fortition of both devoicing and k/ø alternation the source of H has not been identified. Note that according to the Principle of Non-Arbitrariness (KLV 1990:194) there should be a direct relation between a phonological process and the context in which it occurs, which we do not observe in H fortition (such analyses have been extensively criticized as being arbitrary transformations which extend the generative power of the theory by Coleman 1995). Moreover, the issue why a headed stop element requires H, is not explained either (Balcı only says that ʔ has a special status in Turkish).

Second, as can be seen in (13a) Balcı assumes that a stop element ʔ can either be attached to the skeletal point if it is supported by the presence of H or it remains detached (13b). His evidence for the fact that ʔ should remain detached from the skeletal point underlyingly is that there are no word final g's (ʔ) in the spoken language. It seems that Balcı follows such an argument to avoid explaining deletion

[177] Note that Balcı does not deal with k/ø alternation as an extension of word final (de) voicing, giving only a few monosyllabic words as an example. However it has already been mentioned that k/0 alternation is regular in bisyllabic stems.

of (ʔ) followed by a full nucleus, if this element is attached to the skeletal slot underlyingly. However one may wonder if (ʔ) alone is of floating nature, as is implied in Balcı's proposal , why it cannot be attached to the other realized onsets present in the structure eg. O_1 in (13a), which is another arbitrary point of his analysis.

6.3 The summary of the literature review

As have been summarized above, proposals regarding k/ø alternation in both linear and non –linear frameworks have a number of inadequacies. They either do not address all the environments where k/0 alternation is or is not applicable or to put it in other words they propose a generalization which is not inclusive enough to capture all instances of the phenomenon(Sezer 1981). All in all, these accounts tried to explain k/0 alternation as a phonological process (even if it involves a number of arbitrary / ad hoc mechanisms e.g., Denwood (2002)). In what follows we will propose yet another GP account of k/ø alternation, which is based on non- analytic morphology involved in the representation of a number of words which undergo this alternation.

6.4 k/ø alternation as a non-phonological process:

A fresh look from GP perspective

Given that the previous analyses have problems in explaining k/ø alternation, in what follows we will attempt to have a fresh look at this phenomenon through the eyes of GP. First, let us remind the reader that for a process to be explainable in the

framework of GP it should be formed either via composition (fusion) or decomposition (fission) of elements. Processes which require further mechanisms (counting the number of syllables—ON pairs—, referring to the lexical categories a word belongs to—verb, noun etc.—) are considered to be inexpressible in terms of phonology.

Balcı's account of k/ø alternation is based on composition/fortition with the element H in word final environment (which comes with an underlying detached ʔ). However the arbitrariness in H-fortition makes one question the explanatory side of this analysis. He assumes that vowel initial suffixes are attached analytically to the forms subject to k/ø alternation e.g., *çoğu [tʃou]*.

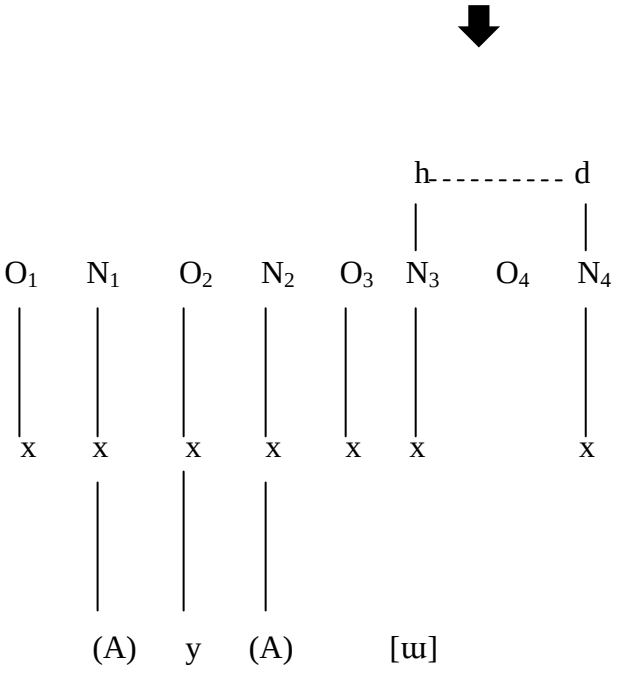
Counter to Balcı we claim that such words involve non-analytic morphology, in vowel initial suffixation. In other words, we assume that there is only one domain in a word like [tʃou] to which phonology applies at once.[178] Consider the structure for accusative form of ayak 'foot' in (14) below:

[178] Recall that analytic morphology involves the following domain structure: [[A]B] where phonology applies first to the inner domain [A] and then to the whole [AB] domain. While in non-analytic morphology, phonology applies to the domain [A] or [A+B]. In short there are no inner domains visible to phonology in non-

analytic morphology.

(14) *ayağı* *[ajaɯ]* ‘foot-ACC.’

phonology at once



In (14) the form ayağı [ajaɯ]is composed of one single domain as is indicated by square brackets and the numbering of ON pairs, in the very same manner a word *el [el]* ‘hand’ would be represented (also cf. the derivation of *dağ type* words in v-initial suffixation in Chapter 4).

Further evidence for the fact that forms like ayağı [ayaɯ] include one single domain comes from the conditions on the occurrence of V.V sequences in Turkish. In particular V.V (phonetically adjacent vowels) can occur:

-Within simplex domains (stem/root) : *ağır [aɯr]* ‘heavy’ careful speech

-Across two independent domains (stem) +(stem) :*ayı ini [ayɯ] [ini]* ‘ bear burrow’ careful speech

but not

- Across dependent analytic domains (stem) +(affix): *kediyi [kediji*] not **[kedii]*

‘ cat –ACC.’ [179]

More specifically if words like [ajaɯ] could be analyzed as independent analytic domains we wouldn’t expect to find a sequence of phonetically adjacent vowels to occur there. In other words, if there were two domains in the accusative form of ayak we assume that there would appear a buffer consonant which comes with accusative suffix {–(y)I} resulting in **ayası [ajasɯ]*, which is not the attested form.[180]

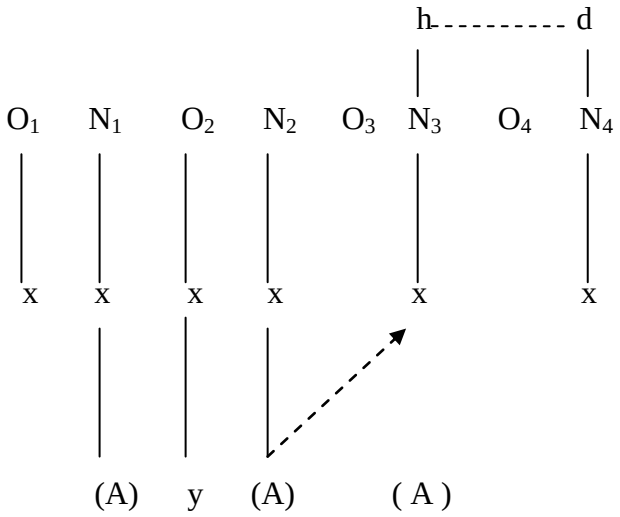
Note also that the element A spreading can take place in *ayak type* words in both directions across an empty onset without a point to a lexically empty position.In particular, we have *ayağı [ayaɯ] ~[ayaa]* ‘foot-ACC’ and *çocuğa [tʃodʒua]~ [tʃodʒaa]* ‘kid-DAT’ in careful and casual speech respectively. Consider the representations in (15a-b) below:

[179] Note that here we assume the vowel initial suffixes in Turkish all of which contain buffer consonants, which gets interpreted when such suffix attaches to a vowel final stem, in their representation eg. –{(s)I(n)}.

[180] ayası [ajasɯ] exists in the language as a 3 SG. SING. Form of the word aya [aja] palm/palm of the hand.

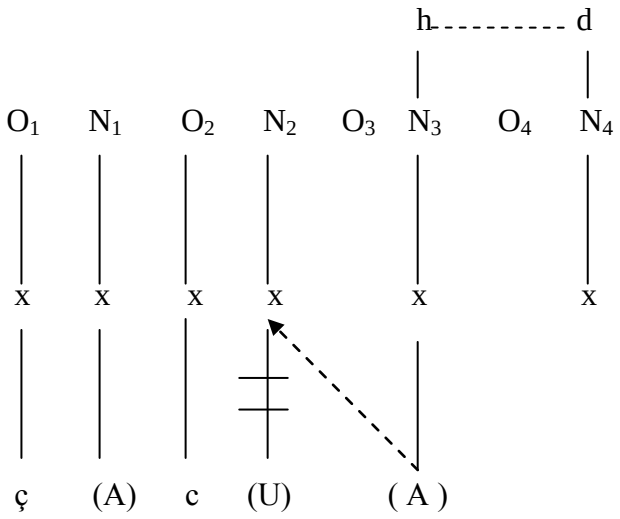
(15)

a. *ayağa* *[ayaa]* ‘ foot-ACC.’ casual speech



(A spreading rightwards)

(b) *çocuğa* *[tʃodʒaa]* ‘kid-DAT.’ casual speech



(A spreading leftwards)

In chapter 5, we have claimed that element A can spread across an empty onset without both rightwards and leftwards a point within domains and only leftwards across domains. Which basically means that element A spreading does not respect

domain boundaries. In that respect A spreading would not be a good cue to detect the number of domains involved in *ayak type* words.

It has to be noted that the forms like *ayağı [ayaɯ] ~[ayaa]* 'foot-ACC' can still be subject to morphological derivation and be regular in that sense, e.g. Italian verbal and nominal inflection which is all non-analytic, but still is completely regular. Consider the examples in (16) below taken from Pöchtrager (2006:24)[181]:

(16)

a.			b.	
fato	*[fa:to]*	'fate'	*fatto [fat:o]*	'done'
casa	*[ka:za]*	'house'	*cassa [kas:a]*	'till'

Consider the first two forms above fato and fatto, the final ending in both words –o shows the inflectional class the word belongs to and also indicates grammatical gender. Therefore these words may seem to be composed of (stem +suffix)[[fat]o] and [[fatt]o].However in Italian a domain like [fatt] cannot exist on its own, as this language does not allow for domain final empty nuclei to be silent (Pöchtrager 2006:237). On the basis of these Pöchtrager assumes that forms like fato and fatto are lexical representations and not result of tconcat( ). In other words these words these words involve non analytical morphology in their structure.

To sum up, in this Chapter we have described *ayak type* words and how they behave in vowel initial suffixation. We have given a critical evaluation of the previous accounts of k~ø alternation which have treated this process as a phonological. Then

[181] The examples above are adapted, we have indicated phonetic forms with [ ] and have ignored the accents.

we have proposed an alternative analysis of the k~ø alternation in GP, we have claimed that forms like *[ayaɯ]* ‘ foot-3 SG.POSS’ should be treated as single domains which involve non-analytical morphology. We have illustrated that the representation of such forms involve an alternating empty onset with a point which can alternate with its pointless counterpart giving rise to A spreading both rightwards and leftwards.

CHAPTER 7

CONCLUSION

This thesis examined the distribution of empty onsets (Ox-O) in careful and casual speech of Turkish in the framework of (Standard) Government Phonology. We have claimed that the presence or absence of the onset point determined by the speech rate/style allows for the optional occurrence of *liaison (ulama/ulaşma*), vowel coalescence (across and within domains), vowel assimilation and glide insertion. We have also examined the structure of *dağ type* and *ayak type* words determining the type of empty onset(s) in their representation and reanalyzing their behavior in the vowel initial suffixation. We have argued that *dağ type* behavior and k~ø alternation should not be treated within the domain of phonology, counter to previous analyses (*dağ type* behavio*r*: Lees 1961; Clements and Keyser 1983; Sezer 1986 and k~ø alternation: Lees 1961; Sezer 1981; Zimmer 1975/78; Denwood 2002).

Our first motivation in this study was to investigate the properties of the so called 'Soft G' <ğ> in Turkish which is assumed to signify some phonological entity the hybrid nature of which, was subject to the constant debate both for phonologists and for phoneticians. In Chapter 3, we have given a critical evaluation of the previous phonological and experimental analyses of the 'Soft G' where we have showed that the basic premises of these analyses and the phonology-orthography confusion taken into consideration in determining the identity of the phonological/phonetic object <ğ> signifies, are not reliable. In the second part of Chapter 3, now looking through the eyes of GP, we have showed that the

environments where we find <ğ> in the orthography correspond only to a number of contexts where there is an empty onset in the GP skeleton. We have emphasized that there is no one-to-one correspondence relation between <ğ> and an empty onset (Ox/O), that is not every environment where we find <ğ> in the orthography has Ox as its structural correlate and not every empty onset is marked with <ğ>. After indicating the non-correspondence relation between <ğ> and O(x) we have showed that Turkish tolerates two types of empty onsets –an empty onset with and without a point-- both domain initially and domain medially, where we follow Charette (2008) for representing Turkish domains. We have discussed domain initial empty onsets and the role they serve in a number of phonological processes in Turkish. Relying on data compiled from Reverse Dictionary of Turkish and Demircan (1981), we have illustrated that optional liaison and vowel coalescence take place in casual speech phonology due to the loss of the skeletal point of domain initial empty onsets in vowel initial stems. We concluded Chapter 3 providing other environments where empty onsets can be observed in Turkish *dağ type, doğa-dua type* and *ayak type* words, and giving a brief introduction on the significance of [Ox] and [O] in those particular contexts.

In Chapter 4, we have discussed *dağ type words* and their behavior in vowel initial suffixation. First, we have given a short literature survey on *dağ type* words-*dağ type* behavior. Second, looking from the GP perspective and going step by step through all theoretically possible variants we have suggested the structure composed of three ON pairs, the first two nuclei of which share the same lexically associated melody and are intervened by a non-alternating [O], to represent *dağ type* words. We have also proposed possible structure(s) for *değ type* words, *dağ type* words which

can optionally be pronounced with a palatal consonant [j] word finally in casual speech. Third, we have presented two other vowel length types attested in Turkish, *merak type* (alternating) and *bina type* (non-alternating). We have compared both types of vowel length to the one represented by *dağ type* words and we have claimed that *merak type* and *bina type* should be represented with branching nuclei. We have also suggested that the only difference between the two length types lies in the type of onset preceded by the metrical head (long and stressed nucleus) and the depleted p(rosodic) licensing power of this head. According to these analyses we have proposed that there are three types of lexical vowel length in Turkish *dağ type, bina type* and *merak type*, the former of which is represented by non-branching lexical structure and the latter two by branching nucleus. Finally in Chapter 4, exploiting the limited phonology-morphology interaction in GP and referring to the core principles of the theory (Principle of Non-Arbitrariness and Minimalist Hypothesis) we have reanalyzed *dağ type* behavior. We have proposed that forms like *[daɯ]* 'mountain 3 SG.POSS' involve non-analytic morphology in their representation and that *dağ type* behavior is not expressible within the borders of phonology.

In Chapter 5, we have analyzed *doğa-dua type* words which have domain medial (alternating) empty onsets in their representation. Making extensive use of the data presented in Sezer (1986) and Kabak (2007) we have proposed that (optional) vowel assimilation and glide insertion processes, observed in casual speech and treated as hiatus resolution mechanisms by Kabak (2007), can be accounted for in a more theoretically tighter and simpler way referring only to the distribution of empty onsets and element spreading. In order to form the basis of our analysis first we had a closer look at hiatus resolution of which grounded Kabak's analysis of the vowel

assimilation and glide insertion. We have clarified the term adjacency as skeletal adjacency and we have claimed that the vowel assimilation and glide insertion processes occur in casual speech phonology due to the fact that this realm of phonology does not tolerate an empty onset with a point to occur in the structure. Therefore [Ox] either has to lose its point or get interpreted via element spreading/interpretation (element A-U-I spreading) from the local nuclear expression. Element spreading in the casual speech forms of doğa-dua type words have showed us that element A, which was proposed not to spread in Turkish by the previous accounts (Charette and Göksel 1994/1996), can spread across an empty onset without a point to a lexically empty position. We have determined that A spreading, which can occur both from left-to right and from right-to left, does not respect domain boundaries. We also tried to give reasons for the optional variants of *doğa-dua type* words in casual speech. We have showed that GP which generates the optional variants is silent in detecting which one to chose. At that point we suggested that may be other phonetic/ pragmatic factors should be taken in consideration in determining the reasons of why we have both options in the language, which is subject to further investigation.

In Chapter 6, we have discussed *ayak type* words and k~ø alternation. We have presented how k~ø alternation was treated in the previous accounts including the recent ones coached in the framework of Government Phonology (Denwood 2002, Balcı 2006). We have seen that all these analyses treat k~ø alternation as a phonological process. After giving a critical survey of the literature on k~ø alternation we have suggested an alternative GP analysis which treats forms like *[ayaɯ]* as single domains which involve non-analytic morphology. We have

assumed that such forms involve an alternating empty onset [Ox] in their structure the evidence for which comes from A spreading (both rightwards and leftwards).

The main aim of the present study was to explore the distributional properties of empty onsets [Ox/O] in Turkish and to identify the role of this distribution on a number of (optional) phonological processes such as liaison, vowel coalescence, vowel assimilation, glide insertion, *dağ type* behavior and k~ø alternation. It is the first study on the Empty Onsets and their function in Turkish, in the Government Phonology (GP) framework, which puts forward the conditions determined by quick/casual speech phonology in explaining optional phonological processes.

We have only tackled the distinction between analytic and non analytic morphology on the basis of *dağ type* behavior and k~ø alternation. We suggest that a wide-range research of the analytic and non-analytic morphology in Turkish should be done. We hope that this study will pave the way for further (theoretical and empirical) research on casual speech phonology (its nature and characteristics) and the optionality in Turkish phonology.

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