THE PHONOLOGY OF ARABIC LOANWORDS IN TURKISH: THE CASE OF T-PALATALISATION

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Declaration for SOAS PhD thesis

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ABSTRACT

This thesis examines the phonological conditions for loanword adaptations in modern Standard Turkish, with regards to the Government Phonology (GP) framework, by analysing Arabic loanwords in Turkish. The main contribution it makes to the study of phonology is an empirical and theoretical analysis of the loanword adaptation process in Turkish. Among many source languages, loanwords adapted from Arabic (pre-language reform, before 1932) are focused on specifically and the nativisation of foreign phonetic and phonological properties - i.e. consonant inventory and syllable structure - is studied.

The thesis elaborates on the phonological environment which is needed for loanword adaptation. There are two main constraints that have to be taken into consideration when explaining the phonology of loanword adaptation:

(i) The elemental content of sounds

(ii) The syllable structure

The thesis discusses these constraints in detail by analysing a specific phonological phenomenon - t-palatalisation - observed in Arabic loanwords. It shows how t-palatalisation operates by placing it in the theoretical context of GP. In order to explain phonological processes GP depends on certain universal principles and language-specific parameters. In GP, arbitrariness is not accepted in phonological phenomena. That is to say, there must always be a causal relationship between the phonological context and the phonological process that is taking place in it. With the help of the restrictiveness of GP, the aim of this thesis is to indicate that in contrast to what has been assumed in the literature, t-palatalisation in Turkish is not lexically but structurally determined by certain conditions. These conditions are independent of the source language, they are systematic and therefore they render t-palatalisation predictable.

CONTENTS

INTRODUCTION

This thesis examines Arabic loanwords in Turkish by analysing their phonological properties. Modern-day standard Turkish consists of Turkic words, words that were newly created by the Turkish Language Association (Türk Dil Kurumu), and individuals who adhered to the principles of the Association, in line with the sound structure of Turkish, borrowings mostly of Arabic, Persian and Greek origin and various other loanwords borrowed from languages such as French and English.

According to the 2005 edition of the official dictionary of the Turkish language (Güncel Türkçe Sözlük) published by the Turkish Language Association, Turkish contains 104,481 words. Of these 104,481 words, about 86% are Turkish and 14% are of foreign origin. Although Arabic is the most significant loanword contributor to the vocabulary of the Turkish language, other contributing languages include Persian, French, Italian, English and Greek.

Turkish used words of Arabic origin for nearly eight centuries during its three main developmental periods which will be outlined later below. However, the non-Latin Turkish alphabets were unable to mark sounds that came from foreign languages, in particular vowels. Because of this, although Turkish spelling can be

analysed over a long period of time, beginning from the earliest historical texts, we do not have sufficient data to be able to determine the time periods for the development of Turkish phonetics, for the development of its sound system and for the "Turkicisation" of the language. However, certain aspects of the language, brought forth through trials and recent research, can still be addressed.

The ratio and rate of borrowing and the usage of loanwords from different languages has changed over time between the languages.

After the Turkish Republic was founded in 1923 the reform of the Turkish language became an important part of several cultural reforms which, in turn, were part of still broader reforms brought in by Atatürk at this time. The Turkish Language Association established by Atatürk in 1932 to ensure the proper organisation of, and research on the Turkish language, spearheaded these reforms. The Turkish script was changed from an Arabic script to a Latin alphabet based script and the Turkish Language Association made a point of replacing Arabic and Persian loanwords, wherever possible, with Turkish counterparts.

The Turkish Language Association was indeed successful in this endeavour. They removed several hundred Arabic words and introduced many new words derived from existing verbal roots. They also put forward the idea of using old Turkish words that had not been used in the language for centuries.

The older generation, those born before the 1930s, continued to use the old Arabic loanwords, with which they are more familiar, since they had been using these, rather than the new Turkish replacements, during their youth. It takes time for a new word to be accepted and then used by a population. Today, many Arabic loanwords are almost only ever used in religious texts or heavily romantic literature.

Some of the new words have still not been widely adopted. This is because the new words do not retain the same intrinsic meaning as their old Arabic counterparts and cannot, therefore, convey the same meaning as they did. Sometimes, over time, the new words take on different meanings altogether. The younger generation often prefer the Turkish counterparts to the old Arabic loanwords along with new European loanwords borrowed, popularly, from English due to the widespread use of the Internet and television. On the other hand, the preference for European loanwords, such as English or French, may indicate a desire for a more "modern" Turkey while the preference for Turkish words, with a Turkic origin, may be an expression of nationalism or just a way for speakers to simplify their language and make it easier to communicate (since the older generation may not be familiar with relatively new English loanwords). Furthermore, although there may still be phonological features that do not adapt to Turkish, for native speakers of Turkish, there is no clear-cut distinction between native words and loanwords (Yavaş 1978: 39).

Aim of the Thesis

The aim of this thesis is to explore the phonology of Arabic loanwords in Turkish and to determine whether, amongst a number of phonological phenomena such as vowel harmony, consonant harmony and stress, t-palatalisation, which is observed only in Arabic loanwords, can be accounted for, or not, by Government Phonology (Kaye, Lowenstamm and Vergneaud 1985, 1990).

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

(i) What is the nature of the palatal and palatalised consonants in Turkish and their palatalisation?

(ii) What do the environments, where palatalised *t* is found in the language, structurally correspond to? Are there any structural or segmental environments which could provide us with the means to make predictions about the process of palatalisation? If yes, what are the conditions for this phonological process?

(iii) What kind of role does the donor language (Arabic) play in the palatalisation process?

(iv) Given the GP principle of universalism, which claims that phonology fundamentally functions in the same way in all natural languages, is t-palatalisation a problematic for the framework or perfectly explainable within it?

Outline of the Thesis

The aim of this thesis is to offer a unified account of the loanword adaptation process within the GP framework. Chapter 1 discusses all the relevant tenets of GP and gives a detailed theoretical background as a basis for the following chapters. Chapter 2 examines the background to Turkish phonology and Chapter 3 examines loanword adaptation processes. Chapter 4, which is the core chapter of the thesis, defines t-palatalisation in Turkish.

T-palatalisation is regarded as a lexical phenomenon in the literature (Lees 1961: 53). This chapter argues against this current view and claims that it is not the lexicon but the phonological environment that determines the availability of t-palatalisation in Turkish. The distribution of t-palatalisation is presented and it shows that its environment is absolutely predictable if certain conditions are met. In Chapter 4, the data is discussed within the GP framework.

Unlike palatalised consonants */l/* and */c/*, the presence of palatalised *t* does not constitute minimal pairs but rather it is in complementary distribution with */t/*. Importantly, in addition to this, */l/* and */c/* are mostly retained in loanwords. That is to say, if they are available in the original form of the loanwords, then they are very rarely altered into their velar counterparts */ɫ/* and */k/*. However, when palatalised *t* is included problems arise. This study clearly shows that, in accordance with loanword adaptation theories, although palatalised *t* is itself a loan sound, its distribution is nativised and thereby has no relation to the source language. It is in a direct relation with the syllable structure of loanwords.

CHAPTER 1: OVERVIEW OF THE THEORETICAL FRAMEWORK: GOVERNMENT PHONOLOGY

1.1. Introduction

In this chapter, I would like to expand on the theoretical framework of Government Phonology (GP). I will be using GP as a base for developing this thesis and as a tool with which to analyse the data. I first introduce the basic concepts of GP in relation to the subject.

GP forms the theoretical basis of this study. The GP method of analysing data has proved to be insightful for many languages including Turkish (for example Charette 2004, 2007, 2008, Denwood 2006, Balcı 2006, Iskender 2008). In this study, I use GP for looking at an issue not challenged before in Turkish. Only certain tenets of GP are discussed because not all of its theoretical issues are relevant to our subject. In fact, there have been several different versions of GP in the last quarter century. Among others, the GP I shall be using for this study will be a standard one based on Kaye, Lowenstamm and Vergneaud (1985, 1990), Charette (1991, 2008), Lowenstamm (1996) and Harris (1997). Following the current GP literature on Turkish (Charette 2007, 2008), I also prefer to apply a non-branching version

of the GP framework[1].

In spite of the presence of different versions, the essential idea of the framework remains the same: GP does not recognise arbitrary paradigms and views phonological phenomena as stemming from universal principles and language-specific parameters. As is well known the concept of "Universal Grammar" (Chomsky 1965) is followed by a very simple observation: there are principles and parameters.

Universal grammar focuses on both the properties that all languages have to share with each other and on the properties that some languages may and can possess. On the one hand, all human languages share certain properties: no language lacks nouns or consonants, for instance. On the other hand, different choices may exist about some other properties of languages. For example, some languages can have consonant clusters word-initially, while others cannot. The former kind of properties that are valid for all languages, without exception, are called principles and the latter kind are called parameters.

To reiterate, the main aim of GP is to analyse phonological phenomena based on universal principles and parameters. Universal principles are inviolable and thus

[1] In this study, I use the theory of traditional government phonology (GP). However, over the past few years, newer versions, such as GP 2.0, have also been used for analysing Turkish data. GP 2.0 is the name given to an “improved” version of GP that was being developed in 2009. Pöchtrager (2010) describes GP 2.0 as being the result of a “major overhaul” of GP and states that it presents a number of questions particularly in the field of element theory (Pöchtrager 2010: 1). On the other hand, like the other non-standard versions of GP such as Strict CVCV Hypothesis (Lowenstamm 1996, Scheer 2004), VC-Phonology (Dienes and Szigetvári 1999), and X-bar theory of GP (Rennison and Neubarth 2003), GP 2.0 is also still a work in process and will not be used in this work.

can easily be predicted; parameters refer to language-specific properties which are assumed to be highly restricted.

Unlike classic rule-based approaches, as a theory of principles and parameters, GP lays the emphasis on phonological representations. For GP, there is a direct relation between a phonological process and the environment in which it occurs: any arbitrariness in this relation is unacceptable. It is the licensing relations which set the limits for phonological facts. I begin by explaining how phonological expressions are defined and represented.

1.2. Representation of Phonological Expressions

In this section, the internal structure of phonological expressions made up of segments, melodic expressions or "speech sounds", is introduced. In GP, without the knowledge of the segmental inventory, it is impossible to investigate phonological processes in a language.

In terms of the representation of phonological expressions, the GP view is dramatically distinct from earlier approaches. Unlike in traditional phonological frameworks, whereby distinctive binary features like [+high] or [-high] defined segments, in GP, distinctive features are not double-valued but monovalent; that is, the absence of a feature in terms of a negative value (e.g. -high) is not expressed.

In fact, instead of distinctive features, there is a simplified set of

elements which generate the phonological expressions. A phonological expression is represented as an organised combination of elements. However, as was first declared by Kaye, Lowenstamm and Vergneaud (1985), these elements, unlike distinctive features, are phonetically interpretable in isolation as well as in combination. Stated differently, a single element can constitute a phonological expression on its own.

The elements are introduced below, preceding a discussion of the notions of headedness and complexity and then the constraints on the potential segments are mentioned.

1.2.1. Elements and Elemental Combinations

Elements, which are identified in terms of their articulatory properties, (this can be inferred from the meaning of the word itself) are argued to be the simplest and fundamental units that generate a phonological expression.

Put simply, the internal structure of segments is based on phonetic realisation. Each element is pronounceable at all levels of derivation from the lexicon to surface form, by itself or in combination with other elements. (Brockhaus 1995: 195). There are six basic elements used in the representation of phonological expressions[2]. Kaye (2000) presents the set of elements as in the

[2] Note that, in the earlier versions of GP (Kaye, Lowenstamm and Vergneaud 1985, 1990), other elements like N for nasality, rather than these six, were employed to generate segments. See Pöchtrager (2006: 12-15) for a survey. On the other hand, Harris and Lindsey (1995) hypothesise

following equation (E stands for elements):

(1) E={A, I, U, H, L, ʔ}

One of the challenging assertions of GP is that vowels and consonants share the same elements to represent place of articulation. The three elements A, I and U can combine with both vowel and consonants while the other three H, L and ʔ mostly only combine with consonants.

Among vowels, A represents lowness, I represents frontness and U represents roundness. The three basic elements consist of the vowels a, i and u by themselves (i.e. when they occur independently as a phonological expression). When they are combined with each other, they can generate all the possible complex vowel combinations in a language.

Among consonants, on the other hand, A inheres in coronal consonants, I in palatals and U in labials. H stands roughly for noise and voicelessness, L is distinguished for nasality and voice and ʔ for stopness. Also note that, L and H can be tones on vowels and L represents nasality within vowels.

When these elements combine to form complex segments, there seem to

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that there is a seventh element @ which is a neutral element, typically representing schwa-like vowels (Harris and Lindsey 1995: 58-64). It is regarded as phonologically empty and shown mostly as ( ) or (_) in current GP analyses. There are also analysts who claim that there are fewer than six elements. Jensen (1994) is the first one who excludes ʔ from the element set. In addition, Pöchtrager (2006) argues that both of the elements ʔ and H can be replaced by the structural representation of the properties with which they are assumed to be associated. According to his analysis, therefore, only four elements remain. (Pöchtrager 2006: 28). Since all these discussions are beyond the scope of this study, I do not mention them in detail and I take the six elements as the base on which to analyse our data.

be two ways for combining: either all elements are equal, or one of them occupies the role of head and the others occupy the role of operator[3]. This, of course, has a significant impact on the generative capacity of elements. Different phonological expressions can be represented with the same elements by just shifting the role of head. For example, the elements I and A, can either combine into the headless (A.I) or into the headed (A.I), giving two different segments with different phonetic interpretations in spite of the presence of identical elements.

Also, there can be more than two elements in a representation. According to Balcı's (2006) analysis, for instance, in the representation of the segment *t* (H.A.ʔ) in Turkish, the element ʔ is the head whereas the elements H and A are the operators (Balcı 2006: 95). Although reversing the head and the operator of a segment creates a new segment, there is no ordering of the operators. That is, (H.A.ʔ) and (A.H.ʔ) represent the same segment. Nonetheless, there are still four possible segments which can be generated by the permutations created by these three elements: three segments with three different heads (H.A.ʔ) (ʔ.H.A) (A.ʔ.H) and the headless segment (H.A.ʔ). However, in Turkish, there is only one segment which includes the three elements H, A and ʔ. The other three combinations are somehow excluded. What restricts the number of potential segments in a language is called licensing constraints and this is explained in the next subsection.

[3] The head is written to the rightmost and underlined.

1.2.2. Constraints on Potential Combinations

In the previous section, the universal constraints that determine the possible segments were investigated. It was argued that all speech sounds in human languages can be represented by elemental combinations. However, since the number of segments that each language permits varies from language to language, some constraints are needed to exclude some of the universally grammatical segments from a particular language and to limit its segmental inventory. If there were no restrictions on possible combinations, then a language could generate innumerable, theoretically grammatical, permutations standing for extra speech sounds which would be unable to exist in a particular language.

Certain language-specific restrictions, which are called licensing constraints, determine the conditions under which one element can combine with another in order to generate a segment.

A set of licensing constraints regulates the segmental inventory of a specific language by several statements such as "U must be head" or "A cannot be an operator". By stating that elemental combinations are subject to language-specific licensing constraints, different combinatorial behaviours of elements in different languages can be accounted for from a GP point of view (Charette and Göksel 1994: 35, 1996: 4).

1.3. Licensing and Government Relations

The notion of government from which Government Phonology takes its name is central to the theory. Nonetheless, it would not make the theory less eligible to give it the name "Licensing Phonology" because government itself is a form of licensing. There is no clear demarcation between the two notions.

The licensing of a position ensures that the constituent at issue can be present in a certain structure. Between and within constituents, some positions, as licensors, license the others, the licensees. The relation between a governor and a governee, however, is a more restricted kind of licensing. For example, a nucleus must have a phonetic content to govern a position but it can license a position even if it has no phonetic content. Since governing relations may be regarded as a subcase of licensing relations, it may be preferable to use the notion of licensing to refer to government. In this chapter, I use the term in its comprehensive meaning too.

The three constituents that GP uses are onset (O), nucleus (N) and rhyme (R) all of which are maximally binary branching. Onset refers to consonants and nucleus refers to vowels. Rhyme, on the other hand, is only a projection of the nucleus (Kaye, Lowenstamm and Vergneaud 1990: 199-202). Instead of the notion of "syllable", GP uses sequences of minimal Onset-Nuclear (ON) pairs to form phonological units. Constituent structure in GP can be represented as in (2) below:

(2) Constituents O_1 N_1 O_2

Skeletal points x_1 x_2 x_3

Segments α β γ

As can be seen, the hierarchical structure in GP consists of three levels: constituents attach to skeletal points and skeletal points attach to segments. Skeletal points are used to derive phonological phenomena. Any expression needs to have an association with a skeletal point to be phonetically interpreted. The phonological expressions are hosted by the segmental level. See (3) below:

(3) (a)* O N (b) O N

x x

As can be predicted, the representation in (3a) is incorrect because the nucleus, which should license the onset, has no skeletal point and there is no head. Indeed, a word like *b is not possible in any language. It indicates that every onset must be followed (that is, licensed) by a nucleus. In (3b), however, there is no problem because the nucleus, as a head, does not need any licensor to be realised. Needless to say, “a” is a perfect word in many languages. Note that, just like onsets, all other nuclei apart from the head must also be licensed in accordance with the Licensing Principle. All phonological processes within GP have to derive from the Licensing Principle:

(4) Licensing Principle

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

GP argues that phonological constituents are hierarchically organised. All positions have to be licensed by another position. Even the “unlicensed” head of a domain must be licensed at some higher level of projection. The only exceptional constituent, amongst them all, is the head of the prosodic structure: this nucleus does not need to be and is not able to be licensed. This kind of licensing between certain positions is called prosodic licensing or p-licensing (Kaye 1992: 305).

In addition to external licensing relations, there are also internal licensing relations between segments and skeletal points. Not only do onset and nuclear positions have to be licensed but phonological expressions have to be licensed also. That is to say, the onset and nuclear positions must license the melodic material that they contain. This is called autosegmental licensing or a-licensing (Harris 1997: 335) and is vital for the purposes of this study. The next subsection looks at these two kinds of licensing relations. The following three subsections examine Licensing Inheritance, which highlights the link between the two licensing relations; government, which is a special kind of p-licensing; and government-licensing which is needed for certain governing relations.

1.3.1. Autosegmental and Prosodic Licensing

Kaye (1992) introduces the concept of p-licensing that regulates the legitimisation of a phonological expression. All units on any level of representation, including the empty categories, need to be p-licensed by another unit. Its properties are stated within the phonological Empty Category Principle (ECP) which is a part of Universal Grammar and states that a p-licensed (empty) category receives no phonetic interpretation. See the following:

(5) P-licensing: An empty category may be p-licensed if it is:

(i) domain-final (parameter)

(ii) properly governed (Kaye 1992: 305).

Kaye (1992) adds two more conditions at the end of his discussion and Kula (2002) adds two more. In (6) below, Kula's (2002) extended version is presented. Following this a brief explanation is given of each category.

(6) P-licensing: an empty category may be p-licensed if it is:

(i) domain-final (parameter)

(ii) properly governed

(iii) a nucleus within an inter-onset domain

(iv) magically p-licensed

(v) domain-initial (parameter)

(vi) an onset within an inter-nuclear domain (Kula 2002: 41).

For the *domain-final parameter*, it should be remembered that in GP all onsets must be licensed by a nucleus. Accordingly, the existence of words ending in a consonant needs a theoretical explanation. The last nucleus should be licensed to remain silent in some way. There are two possibilities with regard to word-final positions: either a language licenses word-final empty nuclei, so that a word may end in a consonant, or it does not license them so words must end in a vowel. In Turkish, for instance, the parameter is "Yes" and words may end in a consonant phonetically.

Proper government is a special kind of governing relation between projections of nuclear constituents and will be discussed later. *Inter-onset government* makes the intervening nucleus between the onsets remain silent. It is mostly used in explaining word-final consonant clusters. *Magic licensing* (which is irrelevant to our discussion) refers to the special properties of the segment s in word-initial positions. *Domain-initial parameter* states that languages may p-license word-initial empty onsets (Kula 2002: 40). It accounts for how words may begin with a vowel although all structures begin in an onset position. An *Onset within an inter-nuclear domain,* on the other hand, concerns cases where, in long vowels, an empty onset is flanked by two nuclei in a non-

branching analysis.

To summarise, in the case of p-licensing, the licensing principle operates within and between constituents whereas in the case of a-licensing, it holds between the melodic material and the constituents to which the melodic material belongs to. Importantly, the quality of p-licensing determines what melodic material can be a-licensed within a position. The next section will, therefore, discuss the relation between the two.

1.3.2. Licensing Inheritance

Harris and Kaye (1990) show that the weakness of the position is the reason why, in intervocalic positions, t is pronounced as a glottal stop ʔ in London English and as a tap stop ɾ in New York City English. The segments lose some of their elements in certain weak positions. As can be inferred from what has been discussed so far, just as all positions do not have the equal power of p-licensing, they do not have the same a-licensing potential either. Harris (1997) uses the concept of Licensing Inheritance to discuss the licensing power of various positions in a prosodic structure and to show the relation between autosegmental and prosodic licensing.

To reiterate, the licensing of melodic content within a position is called a-licensing whilst licensing of positions is called p-licensing. There is also an interaction between a-licensing and p-licensing in that a position can a-license

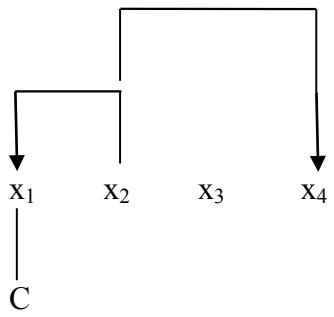
more melodic material if it is directly p-licensed by the ultimate head. This is stated within the concept of Licensing Inheritance:

(7) Licensing Inheritance

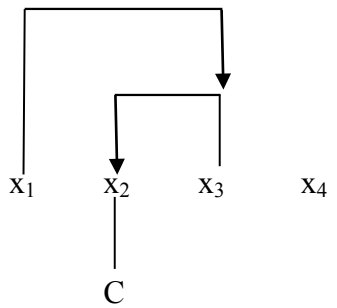
A licensed position inherits its a-licensing potential from its licensor (Harris 1997: 340).

There are other licensors apart from the head of the prosodic structure and those licensors must also be licensed in accordance with the Licensing Principle. If there are intervening licensors between the ultimate licensor and the position at issue, then it means that the a-licensing potential of the licensed position is reduced. In (8), one may see this comparison of foot-initial and foot-internal onset positions indicating the difference in the a-licensing powers of different positions:

(8) (a)



(b)



(Harris 1997: 354)

The indirectly p-licensed and therefore weak onset position in (8b) may be unable to a-license some of its melodic content.

There are two consonants in different positions: the consonant is foot-initial in (8a) whereas it is foot-internal in (8b). As many, including Harris and Kaye (1990), have observed, while there is very rarely a loss in the melodic content of the foot-initial consonant in (8a), the foot-internal position in (8b) is known for its loss of melodic content. Harris (1997) asserts that this is because the domain-initial position is directly p-licensed and therefore has sufficient a-licensing power whilst the domain-internal position is indirectly p-licensed so that there is an intervening licensor x_4 between the ultimate licensor x_2 and the p-licensed x_3 and, therefore, it cannot a-license its content perfectly.

In summary, the a-licensing capacity of a position can be observed in the complexity of the segment that occupies it. Apparently, a p-licensed position can a-license less material than a p-licensing position and, likewise, an indirectly p-licensed position has less of a capacity to a-license its segmental material than a directly p-licensed position. In this subsection, the two types of licensing relations have been introduced. In the next subsection, I mention a special kind of p-licensing: government.

1.3.3. Government

Government is a notion which accounts for both the phonetic realisation of an empty nucleus following a government onset head, and for the simplification of a consonant cluster preceding an unrealised empty nucleus. The theory of Government-Licensing is to do with the argument that a non-nuclear head can govern a complement if (i) it has the required charm value or the required complexity, and (ii) it is licensed to govern by a following nuclear head (Charette 1990: 233).

Government is defined as a maximally binary and asymmetrical relation between two adjacent positions (Kaye, Lowenstamm and Vergneaud 1990: 199 and Kaye 1990a: 306). In other words, (i) greater branching is unacceptable because such branching would violate the Licensing Principle and (ii) there must be a governor which has a more complex elemental content than its governee.

All in all, there are basically three types of government under which these situations occur.

(9) (i) Constituent government

(ii) Inter-constituent government

(iii) Projection government

The first two are about the relationship between skeletal points while projection government is about the relationship between projected constituents. Before going into detail about these types of government, I want to highlight the notions of headedness and complexity as without them governing relations cannot be established.

To reiterate, governing relations are established and determined by the notion of headedness and by the complexity of a phonological expression. I discuss these two notions in the following subsection before looking at the three types of government mentioned above.

1.3.3.1. Headedness and Complexity

The difference in the governing potentials of two segments in a governing domain will be revealed by primarily headedness and secondarily complexity. In any governing relation, the governor must possess the required governing properties. These requirements are satisfied by the internal structures of the segments. First, as mentioned in 1.2.1, a segment is assumed to contain at least one element although, theoretically, it can have more. Second, a segment may or may not have an element in head position. The legitimisation of governing relations between constituents is dependent on the headedness and complexity of the relevant segments.

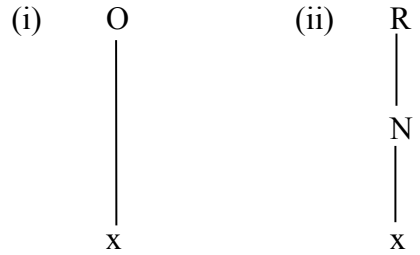
Headed expressions, which can never be governed by a segment, are perfect governors irrespective of the elemental composition of segments. A

headed segment always governs a headless segment even if the headless one is more complex. That is to say, when headedness is involved, complexity has nothing to say. However, a headless segment can also be a governor and govern a headless one. In a case where headedness is irrelevant, for a headless segment to be able to occupy the governing position, its melodic content must be at least as complex as that of its governee. The number of its elements determines the complexity of a segment. Simply, the governor must not have fewer elements than its governee (Harris 1990: 274). The following two subsections reveal the types of government.

1.3.3.2. Constituent and Inter-constituent Government

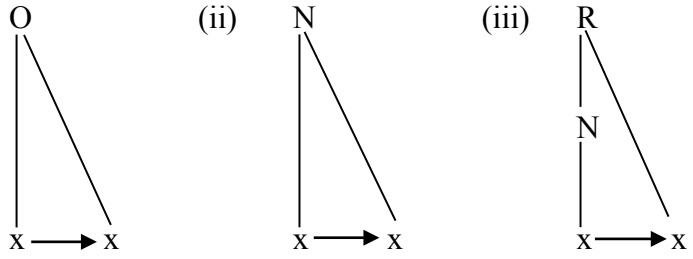
Constituent government is established within branching constituents and thereby is not used in non-branching analyses. For clarity, five types of possible representations for a segment are given below with respect to the definition given in the first sentence of this subsection:

(10) (a) Non-branching cases



(b) Branching cases

(i) (ii) (iii)

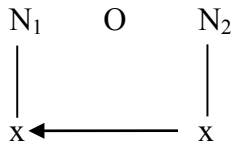


In the representations in (10a), there is only one skeletal point of a constituent and so there is no government relation within the constituent. The representations in (10b), however, demonstrate a branching onset, a branching nucleus and a branching rhyme respectively. There are left-to-right government relations within those constituents and this kind of government is called constituent government.

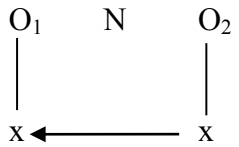
At the level of the onset and nucleus nodes, these constituents either include one segment, i.e. the head, as in (10a), or they contain two segments, a head which is the leftmost segment and a dependent which is the rightmost one, as in (10b). Needless to say, in a non-branching version of GP (which is also used in this study), both onsets and nuclei can contain only one segment. Stated in a different way, the representations in (10b) are not used in non-branching approaches. On the other hand, to explain the above representations very simply, it can be said that, in classical branching versions of GP, the constituents may or may not branch. It is a parametric variation within individual languages. A given language either allows onsets, rhymes and nuclei to branch or not. Some languages do not have consonant clusters, that is, they do not have branching onsets and they do not possess branching rhymes, while

some languages do not have branching nuclei, i.e. no vowel-length contrast. In a non-branching analysis, however, vowel length and consonant clusters are represented by a relation between two constituents divided by an empty position. See the following:

(11) (a)



(b)



In (11a), there is a nucleus-to-nucleus government which implies that vowel length occurs whilst in (11b), there is an onset-to-onset government which implies the existence of a consonant cluster. In both these representations, two skeletal points are required for a governing relation to be realised. However, these two skeletal points are not under the same constituent. Thus, this is called inter-constituent government. In addition, unlike what we see in (10), this time the governing relation goes from right to left. Stated differently, the direction is not from the head-initial position but from the head-final position.

1.3.3.3. Projection Government

In GP, there is also a third kind of relation called projection government whose direction may change parametrically. Unlike the other two relations, this

relation is not between skeletal points but between constituents which are not structurally adjacent on the skeletal level. They are assumed to be adjacent at a higher projection and thereby the realisation of a governing relation is possible.

Projection government is the most common method within GP to analyse various phonological phenomena such as stress assignment, vowel spreading and vowel-zero alternation. All result from relations between the constituents at one level of nuclear projection. However, at this point, I would like to discuss proper government, a kind of projection government, which is a manifestation of the phonological ECP (Empty Category Principle). See the following:

(12) α properly governs β if

(i) α and β are adjacent on the relevant projection

(ii) α is not itself licensed, and

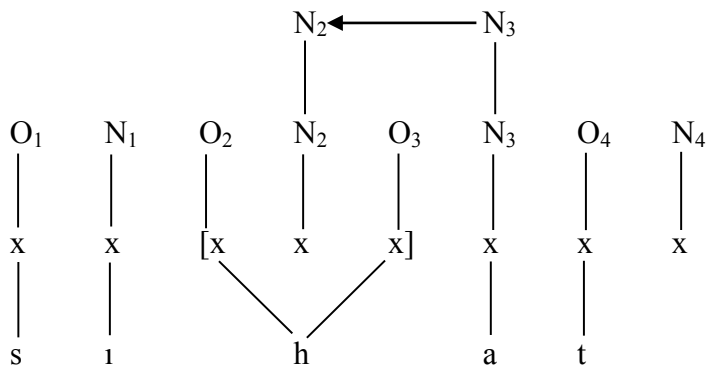
(iii) no governing domain separates α from β (Kaye 1995: 295).

Put simply, a properly governed nuclear position remains phonetically null whereas, in the absence of proper government, the position has to be realised. In other words, an empty nucleus cannot be realised phonetically if it is properly governed by an adjacent interpreted nucleus at a higher level. Otherwise, it cannot remain silent.

On the other hand, the licensing conditions for empty nuclei vary

according to the different positions of the nuclei. Consider the following:

(13) *sıhhat* 'health'



As can be seen above, N_4, as a domain-final empty nucleus, is parametrically p-licensed because the parameter is "Yes" in Turkish. Since (i) N_2 and N_3 are adjacent on the level of a relevant nuclear projection, (ii) N_3 is not p-licensed by another nucleus and (iii) there is no intervening governing domain between N_2 and N_3, N_3 governs N_2 properly and makes it remain silent. N_1, on the other hand, is filled by a phonologically empty segment *ı* ( ) because there is no position to properly govern it and to make it remain silent phonetically.

In this subsection, three types of government have been discussed. Constituent government (which occurs between segments) is not directly related to the concerns of this study while the other two that are also (?) between segments are crucial. It has been shown that the head-dependent relation, within a governing domain, between segments is based on the notions

of headedness and complexity. To summarise, the dependent cannot be more complex than the head, where complexity is defined by the number of elements that a given constituent contains. In the following subsection, I elaborate on the notion of government-licensing.

1.3.4. Government-Licensing

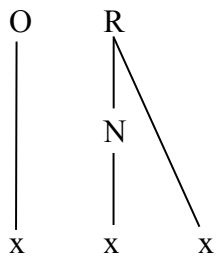
GP does not accept the coda as a possible constituent (Kaye, Lowenstamm and Vergneaud 1990: 201). As can be inferred from the Licensing Principle, word-final consonants must be syllabified as onsets followed by an empty nucleus, as is stated in the following:

(14) Coda Licensing Principle (CLP)

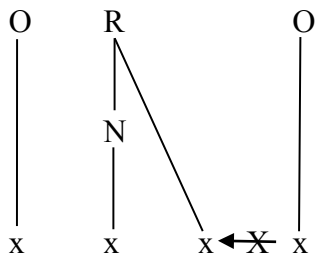
"A post-nuclear rhymal position must be licensed by a following onset" (Kaye 1990a: 311).

The CLP makes the word-final positions represented in (15) below impossible:

(15) (a)*

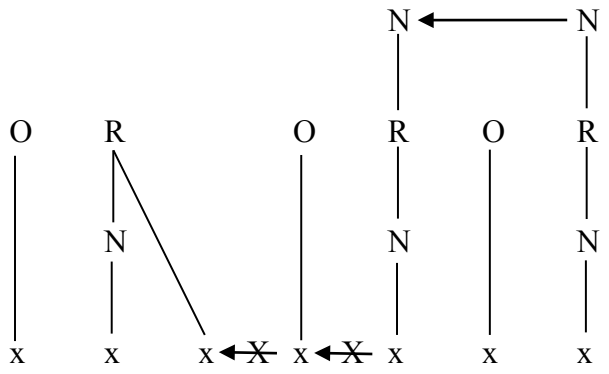


(b)*



Both of these representations are illicit. There is no licensor for the rhyme in (15a) and for the onset in (15b). As mentioned previously, one of the basic dictates of GP is that no position can exist without a licensor. Therefore, onsets and rhymal positions do not exist on their own: there has to be a following nuclear position. See the following representation:

(16) *



In (16), there is a nucleus after the onset position at hand. However, the structure is once again illicit. The properly governed nucleus cannot license its onset to govern the post-rhymal position. With respect to the licensing of onset heads by their nuclear licensor, Charette (1990) proposes the following:

(17) The 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 1990: 242).

To put this informally, a governing relation within an onset cluster needs the licensing support of the following nucleus. Although word-final empty nuclei can government-license their complement parametrically, the licensing support of properly governed nuclei is not sufficient for onsets to govern their complements.

Yoshida (1993) hypothesises that the Government-Licensing Principle should be extended to nuclear relations. He adds a second condition: "for a nuclear head to govern its complement, the head must be government-licensed by the following nucleus" (Yoshida 1993: 151). This accounts for the fact that in many languages, including Turkish, long vowels cannot exist without the licensing support of a phonetically realised licensor.

1.4. Template Hypothesis

It is important to emphasize that, although different, the essential idea of the framework remains the same: GP does not recognise arbitrary paradigms and views phonological phenomena as stemming from universal principles and language-specific parameters. All versions of GP are compatible with the well-known concept of "Universal Grammar" (Chomsky 1965) from which is follows a very simple observation i.e. that there are principles and parameters.

Some languages (e.g. most of the Indo-European languages) are analysed using the branching constituents method although, for Turkish, the non-branching constituents method is mostly preferred within the GP framework. There is one, and

only one, template and where differences occur such as long vowels, consonant clusters and diphthongs, these can be represented in the same way by using intervening empty constituents between sequences of successive constituents (Yoshida 1993: 128). According to Lowenstamm (1996), any kind of phonological entity, in any language, can be inferred from a non-branching analysis in the absence of branching constituents (Lowenstamm 1996: 419). In other words, in this version of GP, there is no need for branching in any human language in contrast to what is assumed by standard GP (Iskender 2008: 65). This issue is beyond the scope of this thesis. Whether Turkish should have branching or not might be a more appropriate question for this study to ask. Following Denwood (1998, 2002, 2006), Charette (2004, 2007, 2008) and Iskender (2008), I adopt the non-branching version of the theory in this work.

Template Hypothesis is also a non-branching attempt to explain different phonological phenomena in a given language. Its four-position template will render the theoretical explanation of t-palatalisation in Turkish possible in Chapter 4. In order to explain the role of syllable structure in t-palatalisation, Goh's (1996) Template Hypothesis and Charette`s (2007, 2008) hypothesis on trochaic foot will be used. The background, development and relevance of the Template Hypothesis to this study will be explained below. Meanwhile, the next subsections will consist of an analysis of the Template Hypothesis proposed by Goh (1996) and its application to the Turkish language by Denwood (1997, 1998).

1.4.1. Four-position Template

The original four-position template about to be described in this subsection is the Chinese minimal phonological string proposed by Goh (1996). This basic four-position template has, as the name suggests, four positions. These four positions consist of two onset-nucleus pairs. The first onset-nucleus pair is the "strong member". There are restrictions on the second onset-nucleus pair. These restrictions allow only for the interpretation of the onset or the nucleus (Denwood 1997: 93).

The various restrictions which may be imposed on how and what can or cannot be interpreted is determined by a language's internal phonological inventory. They are unique to each language. Thus, the restrictions on stems and suffixes and domains in Turkish may be different to the restrictions on stems and suffixes and domains in Beijing Mandarin or Khalkha Mongolian.

Therefore, the four-position template can be greatly extended and applied for Turkish. However, due to different restrictions and different phonological inventories the Template Hypothesis will be changed a bit according to, and in order to accommodate, those differences in Turkish. Khalkha Mongolian has been studied using the hypothesis that all words must conform to one of two interpretations of a four-position template. This template consists of two non-branching onset-nucleus pairs (Denwood 1997: 95). This was an extended study of the hypothesis stated above, by Denwood, following on from the same proposal made for words in Beijing Mandarin by Goh (1996).

Turkish follows a four-position template and although Khalkha Mongolian also follows the same template, Khalkha Mongolian is able to follow various combinations of a four-position Chinese style template whereas Turkish cannot. The four-position Chinese style template does not produce the correct results for Turkish because Turkish suffixes do not end in long vowels (Denwood 1998: 181).

Denwood (1997) discusses templates in detail. She puts templates forward as a solution to the cases she is dealing with. She returns to the idea of a "basic four position template for all stems and suffixes" (Denwood 1997: 88) as part of an analysis of a study on the role of the element I in Khalkha Mongolian phonology. In another study, this hypothesis is extended to Turkish (Denwood 1998). As mentioned previously, Turkish does not produce the correct results when a four-position Chinese style template is used while Khalka Mongolian does. This is because Turkish suffixes do not end in long vowels. In fact, they frequently end in a short vowel e.g. *[arabada]* "in the car" (Denwood, 1998: 181).

Before applying and extending the Template Hypothesis to Turkish, it is important to list some facts about the Turkish language. This will help to establish the similarities and differences between Beijing Mandarin, Khalkha Mongolian and Turkish. Once the similarities and differences in the phonological behaviour of the different languages have been established, the hypothesis used for Beijing Mandarin by Goh (1996) and for Khalkha

Mongolian by Denwood (1997) may be extended to the Turkish language. Below is a list of "Turkish facts" according to Denwood (1998):

(18) i. A minimal word or stem in Turkish conforms to the same basic pattern that occurs in Beijing Mandarin and Khalkha Mongolian e.g. A minimal word has the basic pattern of all the aforementioned languages such as (C)VC (in Turkish) [mal] "property" or (C)V such as in [da:] "mountain".

ii. No suffix has a long vowel.

iii. Suffixes follow a pattern of either -(C)VC e.g. plural -ler or -(C)V, e.g. locative -DA or dative –(y)A (as well as their harmonic counterparts; -lAr, -DA and so on) (Denwood 1998: 181-182).

To summarise the points made in (18) above: The patterns prevalent in Turkish if a minimal word is (C)VC or (C)V or if it is a suffix, are -(C)VC or -(C)V. In addition to this pattern, no suffix in Turkish has a long vowel. It follows that all suffixes in Turkish end in either a consonant or a short vowel. This is demonstrated in the suffix patterns -(C)VC and -(C)V.

The pattern of the minimal word causes no problems for the application of the Template Hypothesis. In this regard, Turkish is very similar to Beijing Mandarin and Khalkha Mongolian. The problems and differences arise with the Turkish suffixes.

Since the Turkish suffixes have either a -(C)VC or -(C)V pattern, second onsets are frequently found in the cases of the -(C)VC pattern such as in the suffixes -*lAr* and -*DAn*. This is in contrast to Beijing Mandarin in which the second onset nucleus pair of a dependent template can never be used. The second onset is frequently found in Turkish suffixes. This is one major difference between Turkish and Beijing Mandarin with regard to the application of the Template Hypothesis.

Denwood (1998) suggests that the answer to the problem of how to split the domains lies in the restrictions on the strict interpretation of a suffix template (Denwood 1998: 182). There has to be a new way to interpret the suffix template for Turkish since it is different from Beijing Mandarin and Khalkha Mongolian although in both Turkish and Beijing Mandarin, suffixes never end in a long vowel. However, they may end in a consonant in Turkish as they do in Khalkha Mongolian. The interpretation of a suffix template is less rigid for Beijing Mandarin where the second onset nucleus pair is never used and it is different from the restrictions on a suffix template in Khalkha Mongolian where one position of the second onset nucleus pair must always be used.

To keep things simple and controlled one might conclude that the suffixes of the pattern -(C)VC are independent suffixes that form a domain on their own, whereas the suffixes of the pattern -(C)V are dependent suffixes. However, this would be unsatisfactory and incomplete, as it would not account for the fact that neither can occur independently of other morphological

classes. Thus, a further analysis must be carried out in order to find a niche explanation and a Template Hypothesis for Turkish.

Denwood (1998) uses three points about its phonological background for her analysis of Turkish. She uses these points as a foundation to work from and form a solid analysis of the situation. See (19) below:

(19) i. Domain-final nuclei in Turkish are always empty.

ii. The parameter is fixed for domain-final p-licensing.

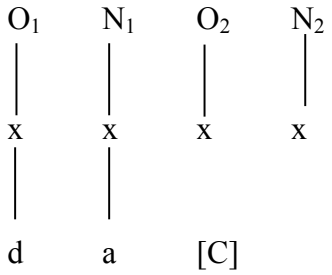
iii. There is only one context in which a domain-final empty nucleus must be interpreted in order to satisfy the requirements of a minimal word. That is when O_2 (second leftmost onset) of a stem template is empty then N_2 (second leftmost nucleus) of a suffix is never interpreted (Denwood 1998: 182).

To reiterate, domain-final nuclei in Turkish are always empty except when the second onset of a stem template is empty and in the case of suffixes where the second nucleus is never interpreted. In addition to this, the parameter is strictly domain-final p-licensing. Although no suffix ends in a long vowel in Turkish, word-final long vowels do occur. Words such as *dağ [da:]* "mountain", among several others, have a final long vowel derived historically from the lenition of a final consonant. These words can and do fit a single four-position template (Denwood 1998: 182).

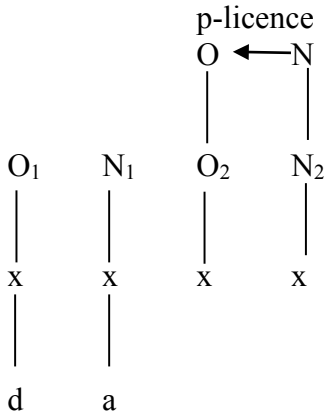
However, it is important to note here, because of its relevance to the study of loanwords in Turkish, that those words which end in a long vowel are different from words which have been borrowed i.e. loanwords that end in a long vowel. The word-final long vowels of loanwords may or may not be considered as long vowels in modern spoken Turkish e.g. *[bina]* - *[bina:]* "building", a loanword from Arabic *[bina:?]* (Denwood 1998: 182).

The final nucleus of Turkish native words, on the other hand, ie words that are not borrowed in origin, may be interpreted in order to "fulfil the requirements of a minimal stem template". In this way, a proper governor is provided for the empty second onset whose final consonant is lost due to lenition. This is demonstrated in the example (20) below using the word *dağ* *[da:]* "mountain" (Denwood 1998: 182):

(20) (a) *dağ* *[da:]* 'mountain'



(b) *dağ* *[da:]* ‘mountain’



In (20a) above, O_2 is empty. N_2 is also empty and is parametrically p-licensed. In (20b), there is a proper governor for O_2 since the content of N_1 is realised in N_2. This realisation provides a proper governor for O_2. However, N_2 is empty and should be parametrically p-licensed. Thus, the condition for a minimal stem is fulfilled in this way (Denwood 1998: 182). As the second part of her analysis, Denwood (1998) proposes that in Turkish:

(21) i. All final nuclei are empty and parametrically p-licensed

ii. There is no condition for a suffix whereby it must occupy one of the positions of the second onset nucleus pair of the template (Denwood 1998: 183).

Denwood (1998) justifies the fact that there need not be a conflict between the ECP and the conditions for a suffix template since a suffix does not need to satisfy the same requirements as a stem. In essence, the stem and

the suffix need to be treated differently. The conditions for a suffix are less rigid. This means that the second onset nucleus pair of a suffix template remains unused (Denwood 1998: 183).

The second onset nucleus pair of a suffix template may remain unused just as it does in Beijing Mandarin (Goh 1996). This may happen if the second onset is empty because then the content of N_1 cannot spread to N_2 to p-license O_2 so the second onset nucleus pair may thus remain unused altogether. In the alternative case, where the second onset has content, then it may be realised (Denwood 1998: 183).

Amongst Turkish suffixes, an example to illustrate this is the ablative suffix *–DAn,* which ends in a consonant, in contrast to the dative suffix *-DA* which has a final vowel. Although the latter suffix, that is the dative suffix, does not end in a consonant, it is still never realised as a long vowel in Turkish (Denwood 1998: 183).

The extension of the four-position template for use in Turkish provides an explanation for the interpretation of empty nuclei that appear to be word final. The apparently word-final empty nuclei should be parametrically p-licensed. The stem-final empty nuclei must be accounted for in order to fulfil the requirement of a minimal word as previously discussed (Denwood 1998: 183).

1.4.2. The Application of the Template to Loanwords in Turkish.

Template Hypothesis is an appropriate theoretical framework with which to analyse the occurrence of t-palatalisation in Turkish and in its loanwords. In addition to this analysis, the aim of which is to provide a greater understanding of t-palatalisation and the theoretical framework used for this study, it must be restated that a non-branching version of the GP framework, following the current GP literature on Turkish (Charette 2007, 2008), will be applied.

Over the course of its history, the Turkish language has borrowed many words from its neighbours. The loanwords that Turkish has adapted from languages such as Arabic, Persian, French, English and Greek are mentioned in Chapter 3. The donor languages from which Turkish has borrowed a number of words all have different phonological inventories to Turkish. The borrowed words, also known as loanwords, must undergo certain adaptations in order to be understood and to allow for their widespread use within Turkish. Although the loanwords do undergo one or more changes, they can still differ from native words. In the majority of cases, these differences allow them to be identified[4]. Due to the phonological differences that occur in loanwords, it follows that the Template Hypothesis must also be applied to them in a unique way leading to slightly different results or patterns. In contrast to the absence

[4] The methods used to identify a loanword are thoroughly discussed in Chapter 3.

of long vowels in Turkish, words that were borrowed by Turkish, from Arabic and Persian in particular, contained long vowels in their original forms. These long vowels lost their length phonetically during loanword adaptation to Turkish. However, although they did not retain their length phonetically, the original length contrast is reflected in the quality of the vowel (Denwood 1998: 186). In other words, the loanwords from these foreign languages lost their long vowels during the adaptation process but in its stead the vowels acquired a different quality in order to compensate for that loss.

For example; the short Arabic [a] usually becomes the Turkish [e] e.g. *[meyve]* "fruit" (Arabic */maywa/*) except in the context of the so-called "emphatic" consonants of Arabic such as *kh*, e.g. *[harf]* **[herf]* "letter of the alphabet". The long Arabic vowels such as *[a:]* in unlicensed positions (e.g. ones preceding word-final consonants) always become the shortened counterpart *[a]* and not **[e]* e.g. *[kitap]* "book" (Arabic */kita:b/*) (Denwood 1998: 186).

To reiterate, all long vowels in unlicensed positions become their short vowel counterpart in loanword adaptation in words borrowed by Turkish. Before the Turkish alphabet was romanised, and while it was written in the Arabic script, it was still possible to tell which vowels were originally long since the Arabic scripture of Turkish differentiated the two in writing although in some cases it did not differentiate them at all. When the Turkish script was romanised, it was still possible to differentiate the long vowels since they were marked with a circumflex e.g. */âli/* "high". However, the use of this circumflex

to denote long vowels in Turkish was never consistent, in the same way that the early romanised spelling of modern Turkish was also not consistent, and over time it was "phased out" (Hony, Alderson and Iz 1992, Denwood 1998: 186).

For the purpose of providing a thorough analysis, Denwood (1998) assumes that Arabic loanwords in Turkish do retain their long vowel. These loanwords can still be parsed using the four-position template, just as in the case of Turkish native words, because of the adaptations they have undergone in order to be understood and used by Turkish native speakers. In other words, the borrowed word assimilates into a form which can be understood by some Turkish speakers and yet leave it in possession of its own grammatical structure. Indeed, the loanword must have a valid grammatical structure and provide ease of pronunciation to be able to survive in the recipient language (Denwood 1998: 186).

If there are any odd characteristics of the loanword which still remain after borrowing and which do not follow the pattern of a typical native Turkish word then they will change over time. Over time, the usage of the loanword over and over again amongst Turkish speakers will eventually make it change and become more like a native Turkish word (Denwood 1998: 186). The phasing out of the long vowel distinction in Turkish script is an example of this.

In other words, loanwords do adapt to the Turkish phonological pattern. If they do not adapt straight away, they will adapt over time. Since they adapt

and follow the pattern of a typical native Turkish word, it is possible to parse them as such and difficulties in these cases seldom arise. Turkish has restrictions on stem and suffix templates which the loanwords must follow as can be seen in (22) below:

(22) i. Turkish words are composed of a minimal four-position stem, interpreted as either (C)VC or (C)V

ii. There is a constraint on suffix templates which prevents the final nucleus from being interpreted. Therefore, suffixes in Turkish never end in a long vowel (Denwood 1998: 187).

Although the above analysis of the use of the Template Hypothesis for loanwords in Turkish appears to come to a satisfactory conclusion, the situation may be more complicated than it seems. Turkish is a vowel-harmonic language and this phenomenon is an indication of the existence of a deeper relationship between the vowels in Turkish words. Rather than the theory that words in Turkish are independent domains, followed by one or more dependent suffixes, they are in fact composed of independent pseudo morphological domains. The Template Hypothesis may be used to understand vowel harmony and the more complex relationships that occur within Turkish words (Denwood 1998: 187).

The Template Hypothesis can give us an explanation of vowel harmony by showing us whether the morphology of the word is "dependently or independently analytic" (Denwood 1998: 187). The Template Hypothesis

explains the occurrence of vowel harmony in Turkish through showing us the dependency (or lack) of domains. In short, any so-called “long” vowel in Turkish must belong to a stem template and is, therefore, harmonically independent. Thus any “short” vowel, not followed by a final consonant, must belong to a suffix template and is, therefore, harmonically dependent (Denwood 1998: 188). To reiterate; a long vowel belongs to a stem template so it is (harmonically) independent and a short vowel belongs to a suffix template so it is (harmonically) dependent. In other words, the vowel in the suffix harmonises with the vowel in the stem of the word.

Turkish is able to follow a four-position template in a similar way to the other two languages mentioned above. The main difference between them and the Turkish language is that Turkish words do not end in long vowels and so the four-position Chinese style templates do not yield correct results for Turkish. The Template Hypothesis must be tweaked in order for it to produce correct results for Turkish. In other words, the template must be applied in a way that suits and agrees with the different parameters and conditions that exist in Turkish phonology.

The Template Hypothesis can be used to analyse loanword adaptations. The use of the Template Hypothesis to say that there is a basic four-position template for stems and suffixes in Turkish, allows us to explain the system of vowel harmony and the dependency relationships between the stems and suffixes in Turkish as summarised above. Of course, the harmonic relationship between vowels in Turkish is not merely because the words are made up of

independent domains with dependent suffixes but rather because the words are composed of independent pseudo morphological domains.

In this chapter, the main ingredients of GP have been introduced. Relying on the theoretical background given in this chapter, the Turkish data will be investigated in the following chapters. The Template Hypothesis and the concept of licensing, in particular, will form the basis of the discussions on the t-palatalisation process. The following chapter, Chapter 2, will provide a short introduction to the basic properties of Turkish in order to familiarise the reader with certain aspects of the analysis in Chapter 4.

CHAPTER 2: LANGUAGE BACKGROUND

2.1. Introduction

The external genetic relationships of Turkish and other Turkic languages are controversial with differing views amongst linguists (Konfilt 1997: 21). According to some Turkologists, Turkish, like other Turkic languages, belongs to the family of Altaic languages. Since Turkic languages are similar in some aspects to the Mongolian and Manchu-Tungusic languages, they all form a language family called the Altaic Language family (Ramstedt 1924: 42, Tekin: 1994: 83, Ölmez and Tekin 2003: 11)[5]. Some philologists have claimed that Turkish is also related to Japanese and Korean[6]. According to them, these are also members of the Altaic Language family (Robbeets 2005: 422). However, the Altaic language hypothesis is highly controversial and many do not agree that these languages are somehow related. In current literature, Turkish is generally accepted to be a member of the Turkic

[5] The Altaic language family derives its name from the Altai Mountains where it is believed that the very first versions of these languages were spoken.

[6] Note that there is also a Ural-Altaic languages hypothesis which states that Altaic languages are related to Uralic languages (Finnish, Hungarian etc.). In other words, they form a language family. There are also hypotheses which propose that Altaic languages are a part of a macrofamily consisting of other language families. These ideas were quite popular in the 19th century but none has widespread support amongst philologists anymore.

language family only and not part of a larger language group (Clauson 1956: 183, Ölmez 2013: 603).

Amongst the members of the Turkic family, Turkish has the largest number of speakers accounting for some 40 per cent of the total number of speakers of Turkic languages. Turkish is the official language of Turkey. It is the native language of over 90 per cent of the population (Kornfilt 1997: 21).

Turkish has a long and traceable history. Nonetheless, perhaps the most notable change it has undergone is the relatively recent language reform ("*dil devrimi*" in Turkish) which formed part of Atatürk's widespread reforms after the founding of the Republic of Turkey. Turkish underwent two major changes as a result of this revolutionary reform programme. The first was the change to the medium in which it was written, changing from the Perso-Arabic script to a specially adapted form of the Latin alphabet, the second was the conscious effort made by the official Turkish Language Association to reintroduce Turkic words back into Turkish. This affected the vocabulary content of the language in particular. This particularly affected the lexicon of the Turkish language (Göksel and Kerslake 2005: 10). The language reform of Turkey and the major changes that were made to the Turkish language during this period are discussed in further detail in 2.1.3.

The very first documented Turkish that exists is written in the Runic script (early 8th century). The early external influences on the lexicon came mainly from Chinese, Sogdian, Sanskrit and Mongolian (Erdal 2004: 522). Later, with the introduction of Islam to the Turkish-speaking people, during the tenth and eleventh centuries, Turkish started to be written in the Perso-Arabic script. Along with this newfound closeness to the Persian and Arabic speaking world, Turkish, in turn,

borrowed many words from Persian and Arabic. Given the prominent role that Persian speakers played in the Turkish-speaking world as far as Islamic religious instruction (catechism) was concerned, it is the accepted opinion that the Arabic words which found their way into Turkish did so as part of the Persian lexicon. These connections were enhanced by the close proximity of the people, by increased trading relations between them and through the existence of common religious texts. Also, the constant interchange between neighbouring or trading communities led to more and more words entering the Turkish lexicon from languages such as Greek and Armenian. lexicon.

As a result of all of these events throughout its history, modern day Turkish consists of Turkic words, Persian words, including Arabic words already borrowed into Persian, as well as a great number of words from French, followed by Greek, Italian, Slavic and Armenian. In the last fifty years, there have been a number of English loanwords too and this trend has very noticeably accelerated in the last decade.

Aside from the different words that have been borrowed by Turkish and how it has thus changed throughout the course of its history, Turkish is a unique language which displays several intriguing features and has been studied in numerous linguistic studies in a variety of fields. This is because Turkish, as a non-Indo-European language, behaves interestingly within its boundaries and limits. It expresses patterns and harmony amongst other phenomena.

Turkish has some distinctive properties in terms of syntax, morphology and phonology. It has a word order of SOV. This means that a traditional and grammatical sentence begins with the subject followed by the object and finally ends

with the verb. Turkish is also an agglutinative language. This means that stems can combine with one or more suffixes following after one another. This produces several different results such as vowel and consonant harmonies or alternating sites for stress.

Turkish is known for being one of the languages that has vowel harmony. In the Turkish case, vowel harmony means that any vowel can occur in the leftmost position, the first vocalic element can be any of eight vowels, whilst the vowel that occurs in subsequent nucleus positions is restricted by certain rules (Charette and Göksel 1994: 38). The subject of vowel harmony will be discussed further in 2.2.2.

Following subsections present a brief survey of the historical epochs of the language. The first period this study will cover begins in the 8th century, the very first dated written text in Kök Türk script, to 1072, the first dated dictionary in Arabic letters. The second period continues from 1072 up to 1932, the year that saw the establishment of the Turkish Language Association which spearheaded the mainly lexical change of Turkish in line with the reforming spirit of the new republic. The third and final period of the history of the Turkish language starts from 1932 up until today.

2.1.1. 700AD to 1072

The earliest and oldest written records of the Turkic language were found upon stone monuments dating to the early eighth century. The Orkhon inscriptions were in great part bilingual, with Chinese and Sogdian, and the earliest ones date

from around 717. These "imperial" inscriptions of the nomadic warlords (kagans) belong to what is commonly known as the Kök Türk (Göktürk in Modern Turkish) dynasty (Ölmez and Tekin 2003: 19-21).

After the Kök Türk state, the Uighur state was founded. The Uighurs produced many written texts that have proved to be very useful in researching the historical development of the Turkish language. The Uighurs abandoned the original Turkish polytheistic *Tengri* "god" religion and Shamanism for Buddhism, Manichaeism, Christianity and Brahmanism, translating the religious texts of these aforementioned religions into their own language (Ölmez and Tekin 2003: 22-24, Erdal 2004: 7).

Indeed, both the Uighur writings and the Kök Türk inscriptions are, together, classified by scholars as the "Old Turkic language". Old Turkic is generally accepted as the pre-Islamic phase of Turkish[7] (Ölmez and Tekin 2003: 18).

2.1.2. 1072 to 1932

Between the 8th and 10th centuries, many Turkic tribes embraced Islam and started to be influenced by Islamic cultures, namely the Arabic but especially the Persian culture. As a result of this, from about the 10th century onwards, the form of writing in the Arabic script was adopted by the Oguz Turks as well as all the other Turkic-speaking peoples who had accepted the Islamic faith. This proved to be very

[7] Not everyone agrees on this. Some researchers take only Orkhon inscriptions to be Old Turkic whereas others consider the very early Islamic texts as Old Turkic too. For a detailed survey of the subject, see Erdal (2004: 20-22).

convenient because the language of the Quran, the Islamic Holy book, was written in Arabic as was Islamic law and as were works of scholarship. Arabic was also the medium of instruction in the only schools available to the Muslim population, the *medrese*s. The influence of Arabic on Turkish became very dominant. In literature however, the influence of Persian was much stronger (Göksel and Kerslake 2005: 10).

In 1072, the "Divanu-Lugati't-Türk" was written. This was a dictionary of contemporary Turkic/Turkish written in Arabic (language as well as script) and edited by the Muslim Uyghur philologist Mahmud al-Kashgari, ostensibly to help Arabs learn Turkic languages. Similarly, in the same era, "Kutadgu Bilig" (1070) and "Atabetu'l-Hakayık" (early 12th century) were written in Eastern Turkic using the Perso-Arabic alphabet. These examples show what an immense influence the Arabic language had over Turkish speakers during this early period (Erdal 2004: 8, 534).

` In fact, in the literature written for scholarly, administrative and literary purposes, the Persian and Arabic components in the language had become so prevalent that Ottoman had become a "hybrid language" (Kornfilt 1997: 23). It had lost some of its characteristic Turkic properties which meant that it was no longer usable as a form of communication for all social classes. People who were not well versed in Arabic and Persian could not comprehend the complexities of this highly stylized courtly and literary language. However, there were also mystical literature and folk poetry written for the enjoyment and erudition of the ordinary people in the colloquial language used by them which retained its Turkish features both in terms of its lexicon and its grammatical structures. The language used in such writings is

very close to the Modern Standard Turkish used today. It is made up of mostly Anatolian Turkish with a little Persian and Arabic influence (Kornfilt 1997: 23).

The development of Turkish as a written language gathered critical mass in the fourteenth century which saw the establishment of Turkish as a literary and administrative language. This language which is mostly called "Old Anatolian Turkish" in the literature is accepted as a member of the Western Turkic language family and also features in the dialects of the Oguz language group (Ölmez and Tekin 2003: 48).

During the Ottoman period, the Turkish language developed from Old Anatolian Turkish (otherwise known as Old Ottoman and used roughly between 13th and 15th centuries) to Ottoman Turkish from about the 16th to the 19th century. "Ottoman Turkish" denotes the form of Turkic which had become the literary and official language of the Ottoman Empire (1300-1922) written in the Perso-Arabic script. How well the written texts reflect the spoken language of that time varies greatly according to the level of education of the writer and the purpose of the writing. It must also be said that some Arabic and Persian vocabulary had become fully integrated into the lexicon[8] (Göksel and Kerslake 2005: 10-11).

Towards the end of the 19th century, a new sense of ethnic identity had begun to emerge among the Turkish elite. Whereas before they had defined themselves as "Ottoman" and "Muslim", now the concept of a "Turkish" national identity had started to emerge. The Ottoman Turkish language naturally fell prey to this revolutionary idea. This was first expressed in 1911 in the journal *Genç Kalemler* (Young Pens) which "called on young writers to put themselves in the service of

[8] See Chapter 3 of this study for the definition of loanwords.

their nation by creating a “national literature” in a “new language”. This “new language” (“*yeni lisan*” in Turkish) was to favour all Turkic forms of Arabic and Persian words, as well as grammatical constructions in the language, except where there was no alternative. This period saw the beginning of the drive for reverting the language back to its Turkic roots. (Levend 1960: 33-40, Göksel and Kerslake 2005: 11-12). These novel ideas were used and applied by the government once the new Turkish Republic was established.

2.1.3. 1932 until today

Alongside various reforms like introducing the civil law code, adopting the Western calendar system and moving from Arabic to Latin numerals, the Perso-Arabic alphabet which had been the writing system of the Ottoman Empire for centuries was replaced with the Latin script in 1928 (Kornfilt 1997: 23).

Making some changes to the Ottoman script and simplifying the language by removing at the very least the complicated Arabic and Persian grammatical features that had seeped into Turkish partly and through the cultural prestige associated with using such linguistic features were issues discussed amongst the Ottoman intelligentsia from almost mid-19th century onwards. The founding of the Republic, with its prominent Turkish identity accelerated such moves resulting in the Latin alphabet being adopted. Some phonetic and phonological features of Turkish such as its rich vowel system which could not be adequately reflected in writing through the Arabic alphabet were part of the linguistic need for this change.

Once the alphabet was changed the impetus for simplifying the language gained momentum resulting in the establishment of Turkish Language Association in 1932. The aim of the organisation was to re-establish the use of words of Turkish origin in written as well as spoken language. According to the Association, prior to the year 1932, the use of authentic Turkish words (with Turkic origins) was about 35-40 %. This figure has risen to about 75-80 % in recent years. However, some scholars argue that this increase is valid mainly for written texts. Citing numerous examples, Lewis (2002) says the reform has hardly changed the speech habits of non-intellectuals (Lewis 2002: 140-152). Others claim that the language reform has brought about a gulf in communication between generations[9].

To put it simply, the language reform replaced the majority of the Arabic loanwords that had mostly been borrowed from Persian during the 11th and 19th centuries with Turkish counterparts that were found in the regional dialects of Turkish or in other Turkic languages or by older Turkic words resuscitated by scholars and amateurs alike, as well as by a number of inspired neologisms and back-formations (including some less successful and even outright dubious formations). For some people, thanks to the secularist and nationalist drive, Turkish changed from being a language with numerous borrowed words from Arabic and Persian to becoming a language which was more loyal and true to its perceived and prized origins with Arabic and Persian loanwords relegated to specific areas such as religious texts and classical poetry.

For others, however, this reform made the language poorer because the sharp change in vocabulary led to people losing their connection to their own language.

[9] See Safa (1970) and Timurtaş (1979) for a brief look to critical views of Turkish language reform.

(Lewis 2002: 142-43). It should also be noted that despite the language purification efforts that came in with the language reform, loanwords from European languages, mainly from French until the 1940s and subsequently from English have entered Turkish in increasing numbers leading some to argue that the language reform has not been successful in eliminating Western origin words[10].

2.2. The Vowel in Turkish

In this section, the segmental composition of the Turkish vowel inventory is briefly summarised within a GP (Government Phonology) point of view. Turkish has an eight-vowel system with symmetrical high-low, front-back, and round-unrounded dichotomies. There are four high, four front and four rounded vowels as can be seen in the following table:

(1)

	Front		Back	
	Unrounded	Rounded	Unrounded	Rounded
High	*i*	*ü*	*ı*	*u*
Low	*e*	*ö*	*a*	*o*

Elements, which are identified in terms of their articulatory properties, as can

[10] However, this assertion is not shared by everyone. See Imer (1973, 1976, 1998) for a detailed discussion.

be inferred from the meaning of the word itself, are argued to be the basic units that generate a phonological expression. Simply put, the internal structure of segments is based on phonetic realisation. Each element is pronounceable at all levels of derivation from the lexicon to surface form, by itself or in combination with others (Brockhaus 1995: 195). There are three elements used in the representations of vowels:

(2) [A, I, U]

As mentioned in Chapter 1, A represents lowness, I represents frontness and U represents roundness. The three basic elements result in the vowels *a*, *i* and *u* by themselves. When they are combined with each other, they can generate all possible complex vowels in a language. It is important to remember that different phonological expressions can be represented with the same elements by just shifting the head. To reiterate, the elements I and A, can either combine into the headless (A.I) or into the headed (A.<u>I</u>), giving two different segments with different phonetic interpretations in spite of the presence of identical elements.

2.2.1. Turkish Vowel Inventory

Turkish has a vocalic inventory of eight vowels:

(3) Close front unrounded */i/*

Mid front unrounded */e/*

Close front rounded */y/*

Mid front rounded */ø/*

Close back unrounded */ɯ/*

Open back unrounded */a/*

Close back rounded */u/*

Mid back rounded */o/*

Their representation in orthography is respectively as follows: *i*, *e*, *ü*, *ö*, *ı*, *a*, *u*, *o* (Charette and Göksel 1994: 36). There are a few points that need to be mentioned about the above-listed vowels. Firstly, the vowel /a/ is a phonetically central vowel although it is a back vowel phonologically. This is based on its behaviour in relation to other back vowels in harmonic processes.

Secondly, all vowels except for /o/ and /a/ have lowered allophones at the end of a word: [*ɪ, ʏ, ɛ, œ, ʊ*]. For a lot of people the vowel /e/ has the allophone *[œ]* before a syllable coda /*m*, *n*, *l*, *r*, *z*/. This means that some people pronounce */e/* as its

allophone when it occurs before the aforementioned syllable codas (Göksel and Kerslake 2005: 10).

Thirdly, Turkish does not have a lexical contrast between tense and lax vowels. In other words, Turkish does not differentiate between them. The tense/lax distinction is instead represented by a headed/headless contrast in GP literature (Charette and Göksel 1994: 36). According to Charette and Göksel (1994), the vocalic inventory of Turkish is a result of licensing constraints imposed on the elements which make up the individual vowels. Licensing constraints for vowels are going to be discussed in the following subsection after which vowel length will be handled in depth.

2.2.1.1 Licensing Constraints for Vowels

It is argued that all speech sounds in human languages can be represented by the elemental combinations. However, since the number of segments that each language permits varies from language to language, some constraints are needed to exclude some of the universal grammatical segments from a particular language and to limit its segmental inventory. Otherwise, without restrictions on the possible combinations they would be able to generate innumerable, theoretically grammatical, permutations which would stand for extra speech sounds but which cannot exist in a particular language.

Certain language-specific restrictions, which are called licensing constraints, determine under which conditions an element can combine with another one in order

to generate a segment. A set of licensing constraints regulates the segmental inventory of a specific language by using several statements such as "U must be head" or "A cannot be an operator". By stating that elemental combinations are subject to language-specific licensing constraints, different combinatorial behaviours of elements in different languages can be accounted for from a GP point of view (Charette and Göksel 1994: 35, 1996: 4).

The concept of licensing is significant for any kind of GP analysis. The representation of phonological domains is directly related to the representations of phonological expressions and all relations within and between phonological expressions are based on the concept of licensing.

The licensing constraints in Turkish on elemental combinations of vowels are as follows according to Charette and Göksel (1994):

(4) i. U must be head.

ii. I does not license operators.

iii. Operators must be licensed (Charette and Göksel 1994: 38).

As a result of the implementation of these licensing constraints on elemental combinations the following vowels with the following phonological expressions arise:

(5)	a (A)	u (U)	i (I)	e (I.A)	
	o (A.U)	ü (I.U)	ö (A.I.U)	ı ( )	(Balcı 2006: 131)

All of the phonological expressions above follow the licensing constraints and are a result of them. This means that if it were not for these licensing constraints, there would have been far too many elemental combinations for far too many theoretically possible vowels. These eight vowels can combine within a domain, namely within a non-compound word, in restricted ways. That is to say, there is no free ordering for phonological expressions.

2.2.1.2. Vowel Length in Turkish

There are three types of long vowels in Turkish:

(6) i. Compensatorily lengthened vowels

ii. Regular long vowels

iii. Adjacent identical vowels

The following subsections address them with examples.

2.2.1.2.1. Compensatory Lengthening

In Turkish, all of the eight vowels have their compensatorily lengthened forms: *dağ* “mountain”, *eğri* “bent”, *Iğdır* “a city in Turkey”, *iğne* “needle”, *uğra* “pop in”, *düğme* “button”, *oğlan* “boy”, *öğlen* “noon”. These words do not have regular long vowels but have phonetically empty onsets filled by the so-called soft-g (*ğ* in orthography) in certain sequences.

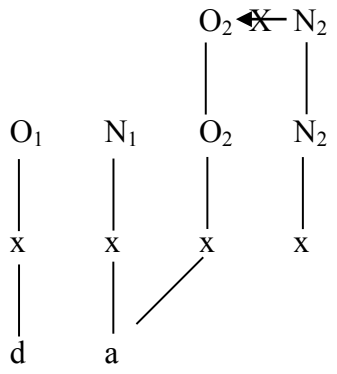
As Lees (1961) has stressed, the soft-g has a tendency to reduce to vowel length or to zero (Lees 1961: 8). See the following:

(7)	(a)	*soğan*	*[soan]*	‘onion’
	(b)	*dağ*	*[da:]*	‘mountain’
		düğme	*[dü:me]*	‘button’

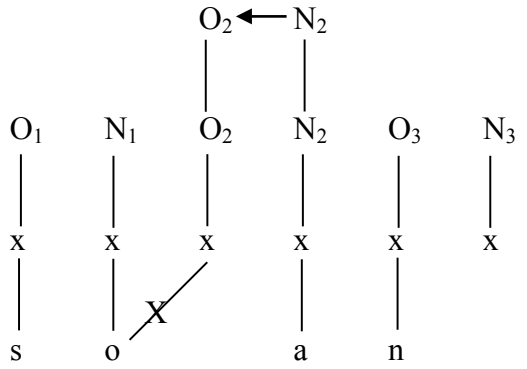
In (7a), the soft-g does not have any phonetic impact on the structure in inter-vocalic positions. In *soğan* “onion”, the soft-g has no phonetic content.

In (7b), however, although it does not have any phonetic content, the soft-g causes compensatory lengthening both in *dağ* “mountain” in word-final position and in *düğme* “button” in coda position. See the following representations.

(8) (a) *dağ* *[da:]* ‘mountain’



(b) *soğan* *[soan]* ‘onion’



In (8a), N_2, as a domain-final empty nucleus, is phonetically empty and it cannot govern O_2. Thus, the soft-g can make the preceding vowel longer. In (8b), however, N_2 is phonetically interpreted and it can govern O_2. Since O_2 is properly governed, it cannot make the preceding vowel longer.

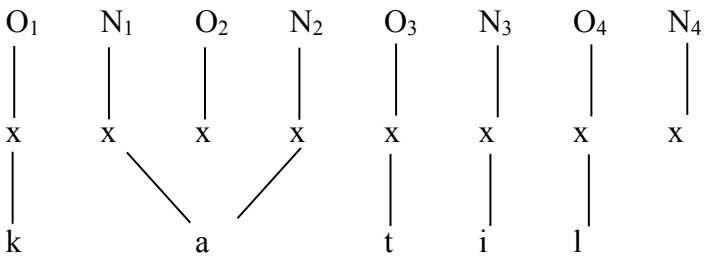
Importantly, with the soft-g, compensatory lengthening can never exist after a long vowel or before a consonant cluster or a word-final consonant. Sequences like VVğ#, VğC# and VğCC# are out. The only two possible sequences are Vğ# and VğCV# as in *dağ* “mountain” and *düğme* “button”.

2.2.1.2.2. Regular Lengthening

Unlike compensatory lengthened vowels, regular vowels are restricted to the following five: *a:*, *e:*, *ı:*, *i:*, *u:* as in the words *ka:til* “killer”, *me:mur* “civil servant”, *müteva:zı:* “modest”, *insa:ni:* “humanely” and *husu:met* “enmity”, all of which are loanwords from Arabic. There are no regular long forms of the vowels *o*, *ö* and *ü*. Just like compensatorily lengthened vowels, regular long vowels cannot surface before a consonant cluster or a word-final consonant. These long vowels shorten when followed by an uninterpreted empty nucleus.

There is no phonetic difference between regular long vowels and the aforementioned long vowels which stem from compensatory lengthening. Nevertheless, phonetically identical objects may have different phonologies as can be seen in (9) below:

(9) *ka:til* ‘killer’



This time, two nuclear positions N_1 and N_2 host the long vowel *a:*. There seems to be no problem with the long forms of the vowels *a*, *e*, *i* and *u*. However, the long *ı:* is problematic for the GP framework.

In Turkish, words can end in a consonant or in a vowel. If a word ends with a consonant, it can be accounted for by the fact that the domain-final empty nuclei are parametrically p-licensed in Turkish. When it ends with a vowel, there are two possible cases: it may end with a high vowel or a non-high vowel. The existence of non-high vowels in word-final positions is not a problem since they are lexically there. Nonetheless, since the non-initial high vowels are lexically empty, as is hypothesised in the literature, the high vowels are not expected to be able to exist in the word-final position. However, this is not the case: there are many words ending with phonetically realised empty nuclei in Turkish:

(10)	*/yapø/*	*yapı*	'structure'
	/korø/	*koru*	'small forest'

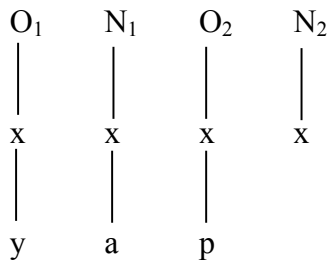
According to phonological ECP, a p-licensed empty nucleus cannot be realised phonetically as is mentioned in Chapter 1. In Turkish, the initial, that is the leftmost nucleus, is the harmonic head and always lexical. The non-initial nuclei, on the other hand, are either empty or lexically dominated by the element A (Charette and Göksel 1996: 6-7). The vowel *ı*, in the first example above, is just the phonetic interpretation of the empty nucleus and includes no elements. Therefore, theoretically[11], it cannot be lexical even in the word-initial position. The vowel *u,* on the other hand in the second example, includes the element U which comes from the

[11] For instance, both vowels in *kıyı* "shore" are not lexical according to GP. The vowel *ı* does not have any elements in its composition regardless of its position.

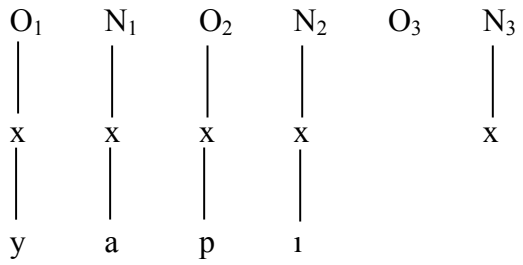
harmonic domain *o*. The empty nuclei in the above forms should have been parametrically p-licensed and accordingly the surface forms of the above words should have been *yap* “do” and *kor* “ember” - which are also real words -, respectively. However, this is not the case and it is a major problem for the framework.

As first mentioned by Kaye (1990), this phenomenon can be explained by assuming that these empty nuclei are not in word-final positions but followed by an onset position lexically[12]. See the following representations:

(11) (a) *yap* ‘do’



(b) *yapı* ‘structure’

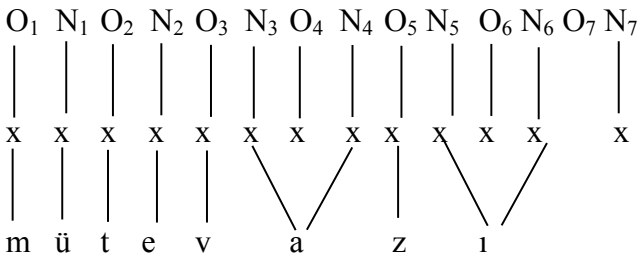


The above representations account for how the empty nucleus in the *yapı*

[12] See Denwood (2006: 500-501) for historical evidence which confirms that Turkish has uninterpreted onsets after word-final empty nuclei.

"structure" can be phonetically interpreted. In (11a), the word *yap* "do" has the parametrically p-licensed empty nucleus N_2 and it is silent as is expected. For the word *yapı* "structure" in (11b), on the other hand, there is an extra ON pair. As is known, every onset must be followed, that is licensed, by a nucleus. The phonetically interpreted empty nucleus N_2 is followed by an onset without a skeletal point and a parametrically p-licensed empty nucleus. In this case, since N_2 is parametrically p-licensed it can, theoretically, have a phonetic interpretation. (Iskender 2008: 81-84). Now see the following:

(12) *müteva:zı:* 'modest'



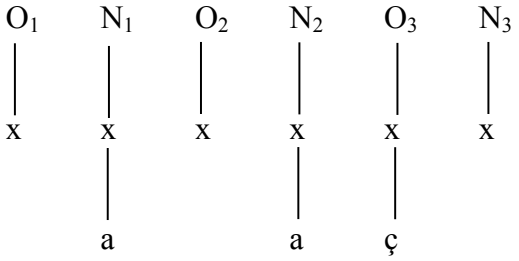
In (12) above, there is a long *ı* sound at the end of the word. What should be kept in mind here is that the vowel *ı* is a phonologically null element. It is just a phonetic interpretation. It cannot be lexical although it is in some loanwords[13]. Therefore, although we assume an extra ON pair as I did in (12), the problem remains for the framework. The extra ON pair solves the problem only for N_6 but not for N_5.

[13] Note that it ends in *i* in Arabic. The emphatic sound represented by ض makes it pronounced as *ı* in Turkish.

2.2.1.2.3. Lengthening Caused by Adjacent Vowels

For certain words, two identical vowels can become adjacent in Turkish. In these cases, another type of lengthening process is observed. The four possible cases are exemplified below. Note that the first word is Turkic. Two short vowels can be adjacent in Turkic-origin words. Nevertheless, the other three are Arabic loanwords since, in Turkic-origin words, it is quite difficult to find lexical long vowels[14]:

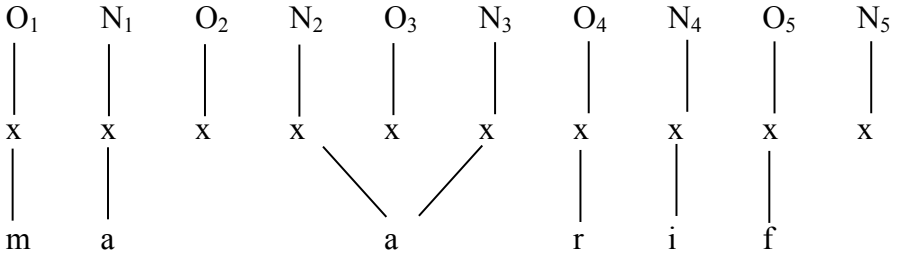
(13) Short-short: *ağaç* *[a:ç]* 'tree'



In (13) above, there is the so-called soft-g which is always silent between two nuclei. Since the two short vowels are identical, they are pronounced like a long vowel. In (14) below, a short vowel is followed by a long vowel:

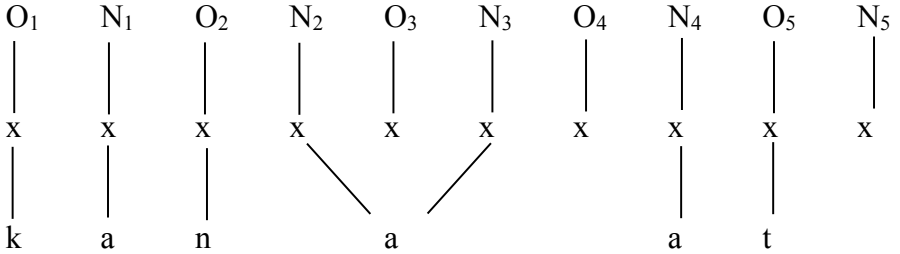
[14] There are a few examples like *ücra* "remote" and *elma* "apple" which once had a short *a* but were probably reborrowed from another language in their current forms. See 3.2.2 for details.

(14) Short-long: *maarif* *[maa:rif]* 'education'



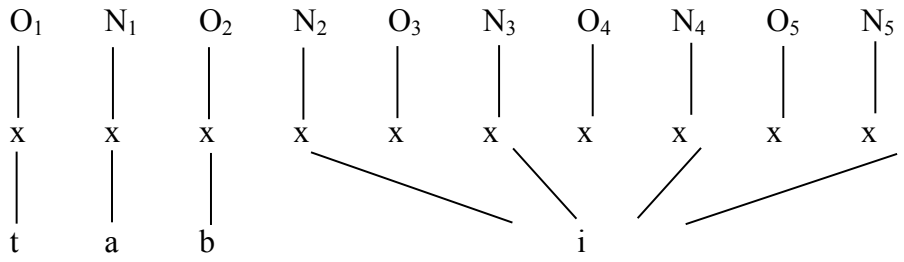
In (14), O_2 is empty and followed by a lexical long vowel. It is pronounced with a little longer *a:* than the regular long *a:*. In (15) below, the positions of the short *a* and the long *a*: are just the reverse.

(15) Long-short: *kana:at* *[kana:at]* 'conviction'



This time, the empty onset O_4 is preceded by a long vowel and followed by an identical short vowel. The pronunciation is as identical as the one in (14). See (16) for a more interesting case:

(16) Long-long: *tabi:i:* *[tabi:i:]* 'natural'



In (16), two long vowels are adjacent. The sound *i* in this word is pronounced as a very long sound, quite different from the regular long *i* in Turkish[15]. All these examples include a phonetically silent onset position between the adjacent vowels. For the first example, *ağaç* "tree", it is the so-called soft-g which is the phonetically null consonantal element. For the rest, which are all loanwords from Arabic, it is the voiced epiglottal fricative represented by the letter ع in the Arabic alphabet and by *ʔ* (glottal stop) in IPA. This sound is not available in Turkish and it simply is not pronounced where it is originally available in the donor language[16].

The vowels in the vocalic inventory of Turkish along with their phonological expressions have been established and summarised in this section. It is important to note that there are no diphthongs in Turkish. It is rare for two vowels to occur side by side in a Turkish word but even in instances where they do, such as in some Arabic loanwords, each vowel retains its original and individual sound. It is not

[15] The length issue is quite complicated and beyond the scope of this thesis. The reader is referred to Pöchtrager (2006) for a detailed survey where he proposes a new point of view within GP.

[16] Anyhow, it may have phonological properties in Turkish. For instance, for some speakers of standard Turkish, the loanwords ending in ع behave as if they end in a consonant although there is no pronounced consonant at the end as in *Sultanahmed Camii* "Blue Mosque" instead of *Sultanahmed Camisi*. Note that the possessive suffix –(s)I(n) is –sI(n) after vowels and –I(n) after consonants. As can be inferred from the abovementioned example, although the word *cami* "mosque" ends in a vowel in Turkish, it may behave as if it does not just like in the donor language.

pronounced to sound like a diphthong (Göksel and Kerslake 2005: 8). The next subsection looks at vowel harmony in Turkish.

2.2.2. Vowel Harmony

Harmony is a phenomenon which involves both vowels and consonants (Clements and Sezer 1982: 215). Consonant harmony will be explained in section 2.3.3. Vowel harmony, in particular, involves the vowels of the language and it happens when vowels in a word (or "lexical domain") all share certain features. The features that may be shared could be front or back phonetic pronunciation amongst others.

As can be expected, a great deal of what I have to say on vowel harmony is not original. Turkish is a typical and very well known vowel-harmony language and there are probably very few works on vowel harmony, if any at all, that do not discuss the Turkish case. There are also descriptive and theoretical studies on Turkish vowel harmony such as Kardestuncer (1982), Parker (1997) and Levi (2000). The aim of this section, however, is to summarise the basic ingredients of Turkish vowel harmony within GP terms.

In agreement with the generally accepted definitions of phonological terms, it is acceptable to say that vowel harmony is a type of assimilation process in which all the vowels in a certain domain must agree on some or other phonological feature. The two main harmony processes are known as consonant harmony and vowel harmony. Turkish is one language that is in possession of this phonological process

as well as all other Turkic languages, Finnish, Hungarian and Yawelmani, and has been a widely researched language for this reason.

In GP, like in many other frameworks, harmony is mostly assumed to involve element spreading. The notion of spreading requires two positions to be realised: a source and a target. In other words, there has to be a lexical element and this element spreads into another position. The six main types of vowel spreading are as follows:

(17) (i) Palatal harmony: front spreading

(ii) Labial harmony: round spreading

(iii) Height harmony: (a) high spreading

(b) low spreading

(iv) Pharyngeal harmony: (a) ATR spreading

(b) RTR spreading (van der Hulst and van der Weijer 1995: 524).

Turkish has two types of vowel harmony: palatal harmony and labial harmony which are respectively called a-harmony and U-harmony in the framework of GP whereby the elements I and U affect the vowels in a word so that they harmonise with one another[17]. Since height harmony (A-harmony) and pharyngeal

[17] To put it briefly here, the difference between the two types of harmony can be explained by the fact that the element I is able to spread into any nuclear position (i.e. is not subject to constraints and is not restricted) whereas element U is not permitted to spread into positions including the element (Charette and Göksel 1994: 38, 1996: 7). This difference will be addressed in detail in the following subsection.

harmony are not related to our topic, these will not be discussed.

In languages which have vowel harmony, what typically happens is that any vowel can occur in the first nucleus of the domain, that is N_1, but the vowels that occur afterward in the recessive nuclei, such as N_2, N_3 etc. are quite restricted. Harmony involves the spreading of elements in a domain[18]. The spreading of the element starts from the governing nucleus into the nuclei it governs (Charette and Göksel 1994: 38-39). With regards to Turkish, this means that whilst any vowel may occur in the first nucleus position of a domain, the recessive nuclei in the domain that occur afterwards are restricted. For Turkish these "restrictions" depend on the licensing constraints of the elements.

When an element spreads into an expression by way of vowel harmony, it is licensed by itself and not by the element it combines with. Charette and Göksel (1994) also add to this claim the fact that an element can only license itself in a role it can occupy lexically. If an element can only be at the head of a phonological expression, such as the element U in Turkish due to a licensing constraint, then this element will never be able to license itself (in the role of an operator) in the phonological expression that it governs (Charette and Göksel 1994: 40).

As stated above, there is no height harmony (A-harmony) in Turkish because, unlike the elements U and I, the element A always occurs lexically in Turkish. This

[18] It should be noted that the notion of "spreading" is not a literal notion whereby the element "moves" to another position (i.e. does not exist in its initial position any longer). It is only a matter of interpretation, following Pöchtrager's view, whereby the "spreading" of x to y means that y receives the same interpretation as x (Pöchtrager 2010) implying that the element may not actually be present in both positions so there is no problem of trying to work out the order of the spreading of elements via vowel harmony i.e. the problem of which element spreads first; such as in cases where both palatal harmony (I-spreading) and labial harmony (U-spreading) occur for one non-initial empty expression.

can also explain why the expressions that occur in the recessive nuclei never contain the elements U or I in their lexical representation which means that only (A) or (_) can be expressions of the recessive nuclei (Charette and Göksel 1994: 39).

Now that it has been established that an element which spreads into an expression will license itself in a phonological expression, the methods of vowel harmony in Turkish can be discussed in more detail. If we recall point (4) from 2.2.1.1, the licensing constraints proposed by Charette and Göksel (1994) in Turkish are as follows:

(18) i. U must be head.

ii. I does not license operators.

ii. Operators must be licensed (Charette and Göksel 1994: 38).

Following the above licensing constraints results in the Turkish vocalic inventory as is given in (5) above and which is repeated here as follows:

(19)	a (A)	u (U)	i (I)	e (I.A)	
	o (A.U)	ü (I.U)	ö (A.I.U)	ı ( )	(Balcı, 2006: 131)

Notice how, in (19), phonological expressions of the vowels are compliant with the licensing constraints and that U is head in any phonological expression it

occurs in. As previously mentioned, vowel harmony involves the spreading of an element from the governing nucleus to any nuclei it governs in a domain. In the following subsections, both I-harmony and U-harmony in Turkish are analysed with examples.

2.2.2.1. I-Harmony

As has been stated, Turkish is a language with vowel harmony. This involves the spreading of an element from the governing head nucleus, N_1, to any recessive following nuclei. Although any vowel is allowed to occur in N_1 in a domain, what can occur in the position of any recessive nuclei is restricted due to this vowel harmony.

In Turkish, there are two types of vowel harmony: I-harmony and U-harmony. This subsection will be concerned with I-harmony in Turkish. Vowel harmony, as a general rule, involves the spreading of an element from the governing nucleus into any nucleus it governs within a domain. This means that I-harmony involves the spreading of the element I specifically, from the governing nucleus of a domain and into the following recessive nucleus it governs.

Unlike the element U, element I is not subject to any licensing constraints. This means that it can spread without restrictions on how and into whichever position it can. It also means that the element I can spread into the head or operator position within a phonological expression. Element I is able to spread into both of these positions because it is also able to occupy them lexically within the language.

In addition to this, when it spreads into an expression, element I is able to license itself and is not licensed by the element which it combines with.

The element I spreads into (_) and (A) phonological expressions from the governing harmonic head nucleus. Examples of instances of I-harmony are given below:

(20)	*/ev-ømøz/*	*[evimiz]*	'our home'
	/ev-larø/	*[evleri]*	'their home'

Please notice here how when the element I spreads into the nuclei that it governs, it can govern either the head or operator positions. As a result of I-spreading, *"ø"*[19] (_) becomes (I), *"a"* (A) becomes *"e"* (I.A); when it spreads into *"o"* (A.U) it becomes *"ö"* (I.A.U) and when it spreads into *"u"* (U) it becomes *"ü"* (I.U). The element I is in operator position in the expressions containing the element U in which U is head due to the licensing constraint which states that U must be head. The element I is in the head position in (I).

In accordance with I-harmony (palatal harmony), the harmonic heads *i*, *e*, *ü* and *ö* cannot be followed by *ı*, *a*, *u*, and *o* and vice versa. This is because the latter group of vowels do not contain the element I. Any situation whereby the harmonic head contains "I" would mean that there would be I-spreading. Thus, recessive nuclei following the harmonic heads *i*, *e*, *ü* and *ö* must contain the element I in their phonological expression. In other words, the harmonic heads *i*, *e*, *ü* and *ö* cannot be

[19] One can also use *ʔ* or *ı* instead since it is the phonetic interpretation of an empty nucleus.

followed by *ı*, *a*, *u*, and *o* (and vice versa) since this latter group of vowels do not contain the element I in their phonological expressions.

To reiterate, I-harmony (palatal harmony or I-spreading) is not subject to any constraints and, therefore, it is not restricted[20]. This is unlike U-harmony where the spreading of element U is restricted. This subsection examined I-harmony in Turkish. Now it is time to address U-harmony and how it differs or is similar to I-harmony discussed above.

2.2.2.2. U-Harmony

In accordance with U-harmony (labial harmony or U-spreading) *o*, *ö*, *u* and *ü* cannot be followed by *ı* and *i*. The other two unrounded vowels *a* and *e*, however, can perfectly follow rounded vowels *o*, *ö*, *u* and *ü* if they agree with respect to frontness. In addition *u* and *ü* can only be followed by *o*, *ö*, *u* and *ü* whereas *o* and *ö* can never occupy a non-initial position. To reiterate what was said in the above subsection and to put it more concretely, it follows from this information that unlike palatal harmony, labial harmony is subject to constraints and is restricted in Turkish.

Now that U-harmony (labial harmony) has been described above, the fact that labial harmony is subject to constraints, whilst palatal harmony is not, must be evaluated within the GP framework. Before this is done, it is worth looking at the possible sequences below using two vowels where both palatal harmony and labial

[20] To put it differently, the I element in the left-most nuclei spreads into the following nucleus positions without any restrictions.

harmony are taken into account. Note that the left column represents the leftmost vowel in a word whereas the right column gives the possible vowels in the following nuclei in accordance with Turkish vowel harmony.

(21)	*a*	→	*a*	or	*ı*
	ı	→	*a*	or	*ı*
	e	→	*e*	or	*i*
	i	→	*e*	or	*i*
	o	→	*u*	or	*a*
	u	→	*u*	or	*a*
	ö	→	*ü*	or	*e*
	ü	→	*ü*	or	*e*

Only element A can occur lexically in nuclei beside the leftmost nucleus of a word because the element A does not spread. While there may be a lexical A, U and I in the leftmost nucleus of a word, it is not possible for the elements U and I to lexically exist in other nuclei. Their occurrence in other nuclei is due to their ability to spread from the leftmost nuclei into the following nuclei (Charette and Göksel 1996: 6-7).

It follows that vowels other than *ı* ( ) and *a* (A) in non-initial positions can only surface via the spreading of the required elements. We can exemplify these

facts with the following:

(22)	*/yüz-lar/*	*[yüzler]*	'faces'
	/köy-øn/	*[köyün]*	'of the village'
	/son-øn/	*[sonun]*	'of the end'

(adapted from Clements and Sezer 1982: 216).

In the above examples, the empty nuclei, symbolised with ø, receive melodic content due to the element spreading. To summarise, I spreading and U spreading involve the rightward spreading of its elements I and U from the harmonic head (Charette and Göksel 1994: 40), the harmonic head being the leftmost nucleus from which the elements spread into the other nuclei. For example, in the word *köyün* "of the village", the non-initial nucleus is lexically empty but the elements U and I which are lexically present in the internal composition of the domain head *ö* (A.U.I) spread into the following nuclear position and provide it with a melody at surface level. In the word *sonun* "of the end", however, there is only I-spreading since the domain head o (A.U) does not contain I to spread. In contrast, in the word *yüzler* "faces", although there is I-spreading, the element U cannot spread into the nuclear position of the suffix since the element A, which is lexically there, blocks the U-spreading process. It also accounts for the fact that the non-initial *o* (A.U) and *ö* (A.U.I) cannot exist in harmonic domains. U does not spread into (A) nor does it spread into an expression containing element A unlike in Khalka Mongolian. This is true when U

occurs alone in an expression such as (U) and even when it is occurring with another element within an expression such as (A.U). The element U spreads as a head into an empty expression (Charette and Göksel 1994: 41-43). Examples of U-spreading into empty phonological expressions, and not spreading into (A) or phonological expressions containing element A, can be seen below:

(23)	*gözler*	'eyes'	but not	**gözlör*
	tozlu	'dusty'	but not	**tozlo*

What restricts element U from spreading into expressions containing A but not into empty expressions? As discussed before, according to GP literature, this has everything to do with the licensing constraint concerning U that states that U must be head (Charette and Göksel 1994: 43). Thus, the spreading of element U into an expression containing element A is prevented. The spreading of U into expressions containing A will yield ungrammatical forms of suffixes as is seen above.

When an element spreads - in this case let us consider the element U spreading into an expression containing A -, it has two options: it either spreads into the head position (e.g. (A.U)) or into the operator position (e.g.(U.A)). The latter option is ruled out entirely by the licensing constraint which states that U must be head. The first option, where U spreads into the head position and shifts A into the operator position, from its original head position, involves what is called “the

shifting of roles", better known as "switching"[21] (Charette and Göksel 1994: 44).

In conclusion; vowel harmony in Turkish involves two types of harmony: I-harmony and U-harmony. This means that the two elements, U and I spread from the first governing nucleus position, N_1 of the domain into any recessive nuclei, N_2, N_3 etc. which it governs. There is no A-harmony in Turkish. In other words, the element A does not spread from the N_1 into the governed nuclei. In addition to this, element U does not spread into phonological expressions containing element A.

There are, however, some differences in the behaviour of the two types of vowel harmony. The main noticeable difference is that element I is not subject to any licensing constraints whereas element U is: U must be head. This causes the spreading of U to be restricted whereas the spreading of I is not restricted. Whilst element I can spread into both the head position and operator position (since it is able to lexically occupy these positions in the language), element U can only spread into head positions. This is in line with the constraint U must be head. Thus, element I is able to spread into (_) and (A) successfully whereas element U only spreads into empty expressions (_) and not into (A). On the other hand, there are many words in Turkish - most of which are loanwords - that violate one or other of the vowel harmonies. These are generally called disharmonic words. However, there are

[21] Switching does not violate any of the licensing constraints proposed for Turkish. However, Charette and Göksel (1994) state that it does not appear to be an "option for Turkish" since it would require a "mechanism which would switch the element A from the head position that it occupies lexically and into the position of operator" (Charette and Göksel 1994: 44). Turkish does not appear to have this mechanism. There is nothing in the phonology of Turkish which rules out switching as a possible process but Turkish just does not have a mechanism for switching the element A from the head position it lexically occupies and into the operator position. In other words, Turkish does not have a licensor for switching whereas languages with similar I and U vowel harmony with no apparent restrictions, such as Sakha, do have a licensor for the switching process so switching is prevalent in the language. Switching in Sakha is licensed by the presence of identical elements undergoing an OCP effect (Charette and Göksel 1994: 47).

different views on this topic within the GP framework. The next subsection summarises them.

2.2.2.3. Non-existent sequences and alternative views

The preceding subsections have shown how vowel harmony works in Turkish. To sum up, from a GP point of view, non-initial positions in Turkish words do not get A by spreading, or by any other process, whereas they can get I and U from the preceding vowel. However, this is not always the case. There are cases where the elements I and U can surface although there is no spreading process. This can be seen in the following Arabic loanwords:

(24)	*aruz*	'prosody'	but not	**arız*
	rakip	'rival'	but not	**rakıp*

As can be seen, the vowels *u* and *i* have not preceding nuclei that includes the elements U and I. In other words, although there is no element spreading, *u* and *i* can surface. Such cases are generally called disharmonic cases and will be discussed in Chapter 4 in detail.

According to one view, vowel harmony is simply not active in roots[22]

[22] Although van der Hulst and van de Weijer (1995) (recapitulated by Polgárdi (1998, 1999) and Kabak and Vogel (2010)) think so, I cannot see why Clement and Sezer (1982) state that vowel harmony is not (or is) active in Turkish roots. They just stress the fact that there is a difference

(Polgárdi 1998: 114, 1999: 187). It just works in the suffixation process. Pöchtager (2009), however, shows that Turkish still has restrictions on the possible sequencing of vowels in roots. He asserts that what is called disharmony in so-called disharmonic roots may not be called disharmony. The concept of disharmony depends on how harmony is defined (Pöchtrager 2009: 6-8). According to Pöchtrager, there is no way that certain words do not undergo spreading because it would be a clear violation of the Minimalist Hypothesis which states that processes apply whenever their conditions are met (Kaye 1992: 141). It can be deduced from what he has said that, if a word exists, it means that it is harmonic.

In a word like *insan* "person", the element I does not spread. This means that either the Minimalist Hypothesis is violated, which is totally unwanted in GP, or the definition of vowel harmony in Turkish should be revised. Pöchtrager (2009) prefers the second choice. He lists the forty-eight possible V-V sequences and shows harmonic, disharmonic and nonexistent ones. He observes that amongst all permutations, sixteen sequences are called harmonic, twenty-two of them are called disharmonic or exceptional and ten sequences -which have been given below- do not exist at all. He finds a way to distinguish the so-called disharmonic sequences like *i-a* and non-existent sequences like *i-ı*. According to him, unlike what Charette and Göksel (1994, 1996) propose, there is no difference between initial and non-initial positions. Pöchtrager's (2009) constraints that (i) I cannot spread into headed

between roots and suffixed stems in terms of their response to vowel harmony in that at root level, some vowels can disharmonically surface in a regular way.

elements and (ii) that U cannot spread into filled positions, exclude the ten non-existent sequences[23].

(25)	*i	→	ɪ				
	*e	→	ɪ				
	*ü	→	ɪ				
	*ö	→	ɪ				
	*u	→	ɪ				
	*o	→	ɪ	or	ü		
	*ɪ	→	u	or	ü	*or*	*e*

The sequences in (25) are not available in Turkish. From this point of view, there is no such thing as a disharmonic word. All available words are harmonic. Pöchtrager's (2009) analysis seems to account for Turkish root-internal vowel harmony. Nonetheless, it does not differentiate root-internal and root-external vowel harmonies although root-external vowel harmony can be explained by Charette and Göksel's (1994, 1996) approach perfectly. In the suffixation process, the so-called

[23] Very roughly, he assumes that there are extra nuclear expressions more than the eight that the current GP literature takes into account for Turkish vowel system. For example, there are headed *a* (A̲) and headless *a* (A). The element I cannot spread into the headed one. As can easily be predicted, *a* in the word *insan* "person" is a headed one. One problem with this view is that there are two different phonological representations for one speech sound. In that sense, Denwood (2010) applies Pöchtrager's (2009) analysis to Arabic loanwords and claims that the headed a (A̲) is the segment *a:* which is always long in the source language and may be shortened in Turkish. She observes that the originally short *a* (A) is always harmonised as in *hizmet* (originally *hizmat* "serving") whereas long a: (A̲) blocks I-spreading as in *kitap* (originally: *kita:b* "book"). Nonetheless, she does not take words like *sürat* "speed" where *a* is originally short and still blocking I-spreading.

disharmonic forms are much more restricted than Pöchtrager (2009) observes root-internally. I, therefore, accept Pöchtrager's (2009) analysis only for root-internal harmony and use the standard analysis for the root-external harmony by accepting the existence of disharmonic cases in Turkish.

2.2.2.4 Vowel Disharmony and Vowel-Zero Alternation

Although it is a well-known fact that vowel harmony occurs in Turkish, there are instances where it occurs but not within its own rules and patterns. Disharmonic cases will be discussed in detail in Chapter 4. This subsection will examine the interaction between vowel-zero alternation and vowel harmony by looking at disharmonic words with alternating sites and it will show that vowel harmony (or disharmony) is not influenced by vowel-zero alternation.

Iskender (2008) investigates the relationship between vowel disharmony and vowel-zero alternation in Turkish in order to find some feasible explanation for these unusual occurrences. There are two ways to explain the occurrence of disharmonic roots in Turkish. One is to accept the lexical appearances of elements U and I and evaluate disharmonic nuclei as non-empty nuclei; the other is to accept that there is another source for the appearances of these elements and this is called “element sharing” (Iskender 2008: 26).

Element sharing is a notion whereby onsets are assumed to share the I and U elements with the nuclei. In the case of element sharing, this would mean that the empty element would still be able to have the elements U and I in the absence of

spreading. This latter method of explaining disharmonic roots can also be used to explain the disharmony which occurs in the suffixation process and follows the current literature (among others, Clements and Sezer 1982, Balcı 2006, Charette 2008, Iskender 2008).

Besides element sharing, there is also a vowel-zero alternation process in Turkish. This means that an alternating vowel may still have an effect on vowel harmony even though it does not exist at surface level. In other words, a vowel-zero alternation process means that a following vowel in the suffix is determined by an alternating vowel (Swift 1962: 32).

(26) */vakit-i/ → vakti, *vaktı* 'its time'

*/gusül-ü/ → guslü. *guslu* 'his/ her ablution'

*/akis-i/ → aksi, *aksı* 'his/ her opposite' (Iskender 2008: 27)

The expected and required pronunciations of the above words in accordance with traditional vowel harmony in Turkish are **vaktı, *guslu, *aksı*. However, this is not the case and the words are pronounced as *vakti* "its time", *guslü* "his/ her ablution", *aksi* "its opposite". This is an indication of the permanent influence of the alternation site (Swift 1962: 33). This subsection has described the relationship between vowel-zero alternation and vowel harmony in Turkish. In summary, for disharmonic cases, although vowel-zero alternation occurs, it does not affect vowel harmony at all.

2.3. The Consonant in Turkish

In the previous section, Turkish vowels were discussed in detail. In this subsequent section, Turkish consonants and their behaviour will be mentioned. There are many studies on Turkish vowels due to their "textbook" or "predictable" behaviour within the language mainly to do with vowel harmony. Turkish consonants have had much less attention in this regard. Similar to Turkish vowels, consonants have an elemental composition in the framework of GP. These elemental compositions of consonants are derived from the interactions of the consonants with one another in phonological processes (Balcı 2006: 32).

The list below represents the orthographic representations of Turkish consonants as shown by Balci (2006):

(27)

Voiceless Consonants	Voiced Consonants	
p	*b*	*n*
t	*d*	[*ŋ*]
k	*g*	*l*
ç	*c*	*r*
f	*v*	*y*
s	*z*	*m*
ş	*j*	
h		

(Balcı 2006: 33)

As can be seen from this list, there are twenty consonants in the orthographic system of Turkish. Of these, eight are voiceless consonants: *p*, *t*, *k*, *ç*, *f*, *s*, *ş*, *h* and twelve are voiced consonants: *b*, *d*, *g*, *c*, *v*, *z*, *j*, *m*, *n*, *l*, *r*, *y*.The velar nasal is also included in (26). The velar nasal [*ŋ*] is used before the velar stops in Turkish and although it does not have a corresponding orthographic representation, it is still an occurring consonant within the language (Balcı, 2006: 33). Interestingly, Balcı's (2006) list excludes the palatal consonants /ɟ/, /c/ and /ɫ/ which are only available in loanwords -as in examples *rüzgar* "wind", *kar* "profit" and *sol* "sol in music"- probably because they do not have a correspondence in the current orthographic system. This is certainly not a good reason for them to be excluded. His list also excludes the palatalised consonants such as palatalised *t* which occurs in certain phonological contexts[24]. This can seem reasonable because they are in complementary distribution with their unpalatalised versions but in that case the fact that the velar nasal [*ŋ*] is not excluded from the list is a contradiction. Therefore, the list can be revised as follows[25]:

(28)

Voiceless Consonants		Voiced Consonants	
p	/c/	*b*	*n*
t	*h*	/ɟ/	*g*
k		/ɫ/	*l*
ç		*c*	*r*
f		*v*	*y*

[24] This phonemena of palatalisation will be explained in Chapter 4.

[25] Since the aim of the thesis does not entail using them, I shall not use IPA symbols in the examples for practical reasons. The letters *c*, *ç*, *j*, *ş* and y are symbolised by /ʤ/, /ʧ/, /ʒ/, /ʃ/ and /j/ by IPA.

s	*z*	*m*
ş	*j*	*d*

In (28), I exclude the palatalised consonants and the velar nasal [*ŋ*] whilst I include the palatal consonants /ɟ/, /c/ and /ɥ/ although they are not represented in the current orthographic system. In terms of their phonetics, the consonants of Turkish may be divided into the following three main categories depending on their properties and behaviour: (i) stops and affricates, (ii) fricatives and (iii) sonorants.

There are more voiced consonants than there are voiceless consonants since the sonorant consonants, which are spontaneously voiced, are also included in the list. This means that the sonorant consonants are voiced randomly and that they can be voiced in some contexts, but are voiceless in others. These voicing alternations of sonorants (this includes fricatives also) occur stem-finally and suffix-initially (Balcı 2006: 33).

2.3.1. Licensing Constraints for Consonants

As we have previously discussed for Turkish vowels in section 2.1.1. Turkish has a few licensing constraints in order to regulate the fusion of elements to form complex vowels. Similarly, licensing constraints have also been proposed for Turkish consonants. Balcı (2006) used the following suggested licensing constraints for Turkish consonants as a result of the elemental composition of consonants he

used for his study of them:

(29) i. ? must be head.

ii. H, L and U cannot be head.

iii. A is not a licensor (Balcı 2006: 59).

Below is a summary of the consonants, which are represented by separate letters in Turkish orthography, together with their elemental representations including the type of consonant they are:

(30)

	stops	affricates	fricatives	sonorants
voiced	b (U.?) d (A.?) g (?)	c ((A.?)(I))	z (A) j (A.I) v (U)	[ŋ] (L) n (A.L) m (U.L) y (I) r (A) l (A.U)

	stops	affricates	fricatives	sonorants
voiceless	p (H.U.?) t (H.A.?) k (H.?)	ç ((H.A.?)(I))	s (A.H) f (U.H) h (H) ş (A.H.I)	

(Balcı 2006: 171)

The above table from Balcı (2006) consists of the consonant inventory of Turkish. Note how the consonants are divided into four phonetic groups: stops, affricates, fricatives and sonorants. The consonant inventory of Turkish is devised entirely from these phonetic groups. As has been said, there are palatal (phonemes in non-GP traditional terms, like */c/*) and palatalised (allophones again in non-GP traditional terms like *[tʲ]* which occur only in certain phonological contexts) consonants in Turkish. The palatalisation issue in Turkish will be discussed in detail in Chapter 4. This subsection has examined licensing constraints for consonants in Turkish. The following subsection will address consonant clusters in Turkish.

2.3.2. Consonant Clusters

In traditional terms, a group of consonants which have no intervening vowel constitutes a consonant cluster. By definition, a consonant cluster cannot be interrupted by a vowel. Turkish allows word-internal and word-final consonant clusters. Nevertheless, the words –or the domains- can end only with right-headed clusters. That is to say, only right-to-left government is possible between the onsets. Logically, being structurally adjacent entails being phonetically adjacent. If two structurally non-adjacent onsets are phonetically adjacent, there must be an uninterpreted intervening nucleus between the two onsets in question (Iskender 2008: 132).

In accordance with the phonological ECP which was discussed in Chapter 1, an empty nucleus can remain silent if it is (i) parametrically p-licensed, (ii) properly governed by the following interpreted nucleus or (iii) if it is closed within an inter-onset government domain. The first two reasons might be used to explain the word-medial consonant clusters while (iii) can also explain the word-final consonant clusters. In this section, I first mention how consonants can be phonetically adjacent in word-internal positions. I then clarify the requirements for the realisation of word-final consonant clusters in Turkish.

2.3.2.2. Word-Internal Clusters

According to the generalised recognised knowledge of the syllabic system of the Turkish language, it might be assumed that Turkish does not like consonant clusters. Nonetheless, in Turkish, there appears to be word-internal consonant clusters. Although consonant clusters do appear to occur in Turkish, their occurrence does not come with an underlying explanation.

This subsection will explain the occurrence, in Turkish, of the apparent consonant clusters which occur within a word, that is, word-internally. The explanations behind the apparent word-internal consonant clusters are given via analytic morphology, via inter-nuclear relations and via inter-onset relations.

2.3.2.2.1. Via Analytic Morphology

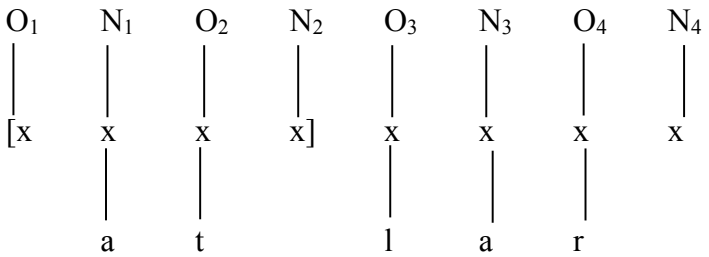
Analytic morphology is one method by which the occurrence of word-internal consonant clusters in Turkish may be explained. The theory of analytic morphology that allows for the understanding of these word-internal consonant clusters, consists of analysing the morphology of the word which is being examined. In other words, what may seem to be a word-internal consonant cluster in Turkish may only be down to the morphology of the word. The morphology of the word, including the morphemes which make up that word, may give the illusion of the existence of a consonant cluster. However, it is only the side-by-side occurrence of particular morphemes which gives this illusion. The word-internal consonant cluster

can be identified and understood by analysing the morphology of the word.

The occurrence of particular morphemes within a word naturally affects the behaviour of the whole word. For example, the word *atlar* “horses” appears to have a word-internal consonant cluster *tl* at surface. In fact, the *t* belongs to one morpheme and the *l* belongs to another morpheme. So the *tl* consonant cluster is really just the last phoneme of the first morpheme occurring next to the first phoneme of the second morpheme.

What prevents a reader of Turkish from pronouncing *atlar* “horses” without the *tl* sequence?[26] How do Turkish readers identify the morphemes? Iskender (2008) states that the domain-final empty nucleus intervenes between the consonants so that they are not read as a consonant cluster. This can be exemplified in the branching illustration below:

(31) *atlar* ‘horses’



In summary, the last phonetically expressed segment of the word *at* “horse” which is *t* and the initial segment of the plural suffix *–lAr* which is *l* are phonetically adjacent even though they are structurally broken up by the domain-final empty

[26] Note that **atl* is not a possible word in Turkish.

nucleus N_2. The *t* and the *l* are only occurring in adjacent positions and so, although they appear to create a consonant cluster, they do not. This is due to the fact that their side-by-side occurrence is broken by the domain-final empty nucleus which occurs at the end of *at* "horse". By using the method of analytic morphology, the theory is accepted apparent word-internal consonant cluster may be explained simply as adjacently occurring consonants broken up by the domain-final empty nucleus.

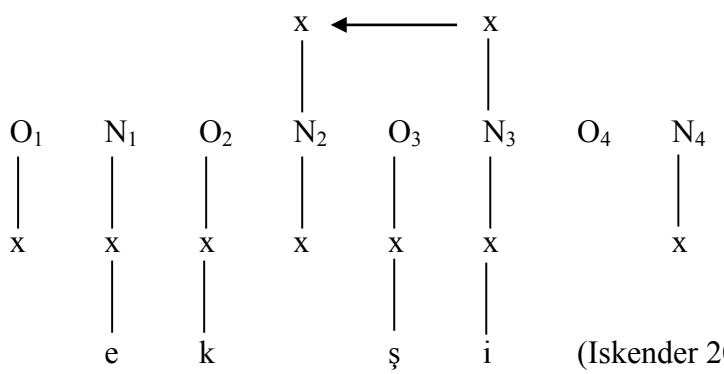
Dependent analytic morphology proposes that the root of a word and the suffix of a word combine analytically just as in the word *atlar* "horses" above. If the root and the suffix combine analytically then N_2, which is parametrically p-licensed as a domain-final nucleus, can be silent although it is in a word-medial position (Iskender 2008: 135).

2.3.2.2.2. Via Inter-Nuclear Relations

In the previous subsection, the method of analytic morphology was used to understand consonant clusters. This involved analysing the morphemes from which the word was made up. This section looks at the relationship between nuclei. The effect which one nucleus may have on another nucleus within a domain will be examined.

An inter-nuclear relation is another method for explaining the occurrence of word-internal consonant clusters in Turkish. Simply put, a nucleus can make its preceding nucleus silent via proper government. This is shown in the branching illustration below:

(32) *ekşi* ‘sour’

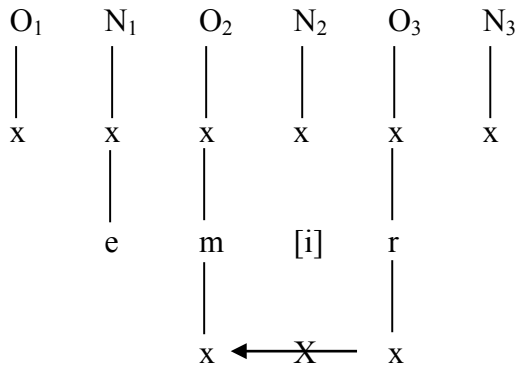


(Iskender 2008: 124)

The word *ekşi* “sour” does not consist of separate morphemes as was the case with *atlar* “horses” above. This word consists of the root morpheme only. So how does the apparent consonant cluster *kş* occur?

As can easily be seen in (31) above, the consonant cluster *kş* is structurally non-adjacent. The phonetically interpreted nucleus, N_3 properly governs N_2, thus, N_3 makes N_2 remain silent. When N_3 is absent, the form **ekş* is impossible in Turkish. Instead, a non-existing form like *ekiş,* with an interpreted intervening vowel, is expected. N_3 is required to license N_2 so that it remains silent. Without it, an ungrammatical form **ekş* would evolve. In other words, N_3 is required in this case, for the grammatical occurrence of the word-internal consonant cluster. The apparent consonant cluster is, in fact, broken up by a governed silent nucleus that occurs between the two consonants. However, this medial nucleus must be governed by N_3 in order for it to remain silent and grammatical. Without this governing nucleus, the word becomes ungrammatical and it would be expected to place a vowel between the two consonants to break up the consonant cluster. See the example below of the loanword *emir* “order” which is originally *emr* in Arabic:

(33) (a) **emr ~ emir* 'order'



(Iskender 2008: 126)

Whether or not the empty nucleus is phonetically interpreted is directly related to the elemental properties of the consonants separated by the empty nucleus. In (32), *r* cannot govern *m* due to their elemental properties: O_3 is not a good governor for O_2, and O_2 is not a good governor for O_3. The following subsection is about word-final consonant clusters in Turkish and will consider possible governors and governees for inter-onset government in Turkish.

2.3.2.3. Word-Final Clusters

In Turkish, certain consonant clusters can occur word-finally. In order to be able to predict whether a particular consonant cluster is possible in the word-final position in Turkish, there needs to be possible governors and governees for inter-onset government. Inter-onset government is a government relationship between two onsets. An inter-onset relation can explain the occurrence of consonant clusters which occur word-finally in Turkish. The method by which the two consonants, of

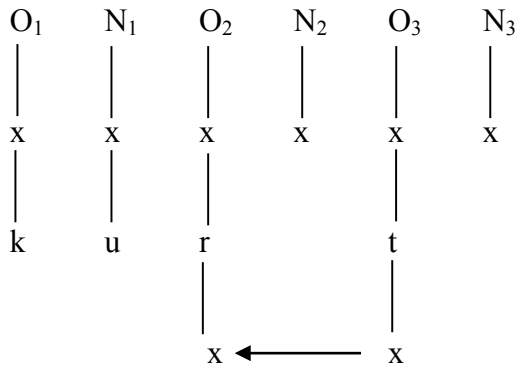
the word-final consonant cluster, interact with one another and how this influences them is part of the inter-onset relation.

As mentioned in Chapter 1, the inter-onset relation between the two consonants is a government relationship. This means that for the inter-onset relation to be allowed, there needs to be a governor and a governee in the cluster so that one consonant may govern the other. In other words, one consonant needs to be a governor in order to govern the other consonant, which, in turn, is called the governee. The possible consonantal governors and possible consonantal governees will be discussed on the following pages but, first, a brief introduction and illustration of the meaning of inter-onset government must be given.

Typically, Turkish has a syllabic structure of CV(C). This means that there is usually an intervening vowel between any two adjacent consonants. Of course, this is not always the case and consonant clusters are not an impossible phenomenon in Turkish. This subsection is dedicated to the analysis of various consonant clusters which occur word-finally.

If two consonants are to occur in adjacent positions in Turkish, the intervening vowel must be made silent. In fact, the only way to make consonant clusters which occur word-finally in Turkish is by making the intervening nucleus silent. An intervening nucleus may be made silent by an inter-onset relation between the two onsets. In standard GP, the only type of possible inter-onset relation is the inter-onset government. An example of inter-onset government is as follows:

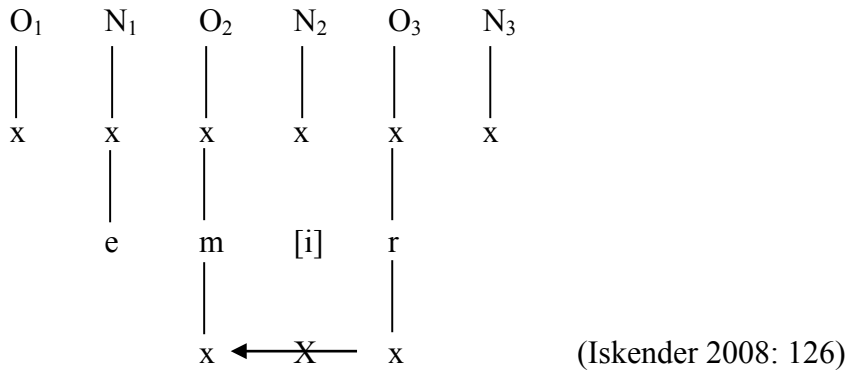
(34) *kurt* 'wolf'



(Iskender 2008: 125)

In the above example, N_3 is being parametrically p-licensed and is therefore not a potential proper governor. There seems to be neither analytic morphology nor proper government available. How, then, does N_2 remain silent? N_2 is able to remain silent due to the inter-onset government relationship between the two onsets, O_2 and O_3. The elemental properties of the two onsets allow for an inter-onset relation. The elemental properties of consonants and how they affect government will be discussed in this subsection shortly. Briefly, the cluster in *kurt* "wolf" consists of the possible governor *t* and the possible governee *r*. Their adjacent positions and elemental properties, which make them suitable for their governor and governee roles, in other words their ability to form an inter-onset relation, makes N_2 remain silent. However, there are also some clusters which cannot build an inter-onset government relation like the above word and are, therefore, ungrammatical in Turkish. Recall (33):

(35) (a) **emr ~ emir* 'order'



(Iskender 2008: 126)

Obviously, whilst *rt* is a possible consonant cluster in Turkish *mr* is not. Therefore, such sequences in loanwords are interrupted by a vowel.

2.3.2.3.1. Possible Governors and Possible Governees

Possible governors and governees need to be determined in order to predict whether a consonant cluster is able to occur in the word-final position. Balcı (2006) investigates this area of study. This subsection will demonstrate that the list of possible governors and governees provided by Balcı (2006) excludes certain existing clusters and, in addition, predicts impossible clusters in Turkish.

In his study, Balcı (2006) ascertains that there are thirty-four existing word-final consonant clusters in Turkish as listed in (36)[27]:

[27] Beside these thirty-four, there are some other clusters like *lf* and *nz* available in *golf* "golf" and *bronz* "bronze". These two clusters can also be predicted by using his list.

(36) *rk, rt, rp, rz, rç, rs, rş, rm, rn, rj, rf,*

lk, lt, lp, lç, ls, lm,

nk, nt, ns, nç, mt, mp, mk, ms,

ft, ht, vk, şt, şk, sk, st, sp, ks (Balcı 2006: 97-98, 108).

By looking at all of the existing word-final consonant clusters, he determines the possible governors and governees in Turkish:

(37) (i) Possible governors: *p, t, k, ç, z, j, ş, n, m, s, f*

(ii) Possible governees: *l, r, [ŋ]*[28]*, v, h, n, m, s, f* (Balcı 2006: 106, 121-122).

The hierarchal order of the consonants depends on their elemental composition, according to which their strength and ability to govern or be governed is determined. Their elemental composition can be identified using the knowledge of the complexity and headedness of the consonants in question. Balcı (2006) proposes models for all consonants in Turkish. The elements used in the descriptions of phonological segments were discussed in Chapter 3, but, to reiterate, there are six

[28] As pointed out before, this segment is in a complementary distribution with *n* in Turkish. It only occurs before velar consonants. In other words, besides *ŋk*, it is not possible to find another cluster like it in Turkish. It should also be noted that this list lacks the voiceless palatal stop /c/, the voiced palatal stop /ɟ/ and the velar lateral /ɫ / which are not shown with a different letter in the Turkish alphabet. Importantly, they may not be in complementary distribution with their counterparts in many cases. For example, both *lp* and *ɫp* are possible in the words *kalp* "heart" and *kalp* "counterfeit", respectively. Therefore, instead of *ŋ*, the segments /c/, /ɟ/ and /ɫ / might have been added to the list.

basic elements which are used to describe phonological segments. For example, the representation (U.H) is the combination of the elements U and H. In his analysis, the aforementioned representation has no head and is the representation for the *f* segment.

Balcı (2006) also suggests that whilst some consonants are always headed, other consonants such as voiceless fricatives and nasals are always headless. Basically, some consonants are always headed and others are always headless. In addition to this, he claims that the governees must be headless and the governors must be headed.

A headed governor does not need any other criteria for inter-onset government to be realised (Iskender, 2008). On the other hand, a headless governor, needs the complexity values of the consonant in question to be taken into consideration for there to be any possibility for inter-onset government. The complexity values of the consonants would have to be evaluated according to the Complexity Condition proposed by Harris (1990), in which he states that the governors must be equally or more complex than the governees in terms of their elemental compositions in order to be able to actually govern them (Balcı 2006: 106-110). This field of study is rather detailed so not all of it will be discussed here. However, some of it is relevant to this study and these parts will be discussed.

As was previously mentioned, the list of possible governors and governees provided by Balcı (2006) excludes certain existing clusters and, in addition, predicts impossible clusters in Turkish. For instance, not all the potential governees precede all potential governors in Balcı's (2006) list. If they had, consonant clusters such as **mf* and **nm* would be expected to form. For example, the logical combination *nm*,

according to Balcı's (2006) analysis, depends on the elemental combinations of *n* (A.L) and *m* (U.L). The possible governee *n* is headless and the possible governor *m* is also headless. Since both the possible governee and the possible governor are headless, the complexity values must be examined. The complexity values of both the possible governor and the possible governee are the same since they both have the same number of elements. It is, therefore, possible to deduce that, according to the Complexity Condition, there is no obstacle to an inter-onset relation being formed between the two consonants. Despite this, however, **nm* is an impossible cluster in Turkish[29] (Iskender 2008: 129). In conclusion, Balcı's (2006) list predicts impossible clusters in Turkish.

As well as predicting the existence of impossible clusters in Turkish, Balcı's (2006) list also excludes some consonant clusters that do exist in real words in Turkish. There are numerous examples of this such as, *şerh* "commentary", *zırh* "armor", *sulh* "peace", *mezc* "adulteration", *gayz* "grudge", *gayb* "imperceptible", *zeyl* "addendum", *Kureyş* "a clan name" and *hamd* "glorification" which are all loanwords from Arabic (Iskender 2008: 128-130). A few of these words are commonly used. Iskender (2008) comments that among the hundreds of logical possibilities there might be some possible non-existing domain-final clusters which cannot be predicted by his list. In other words, there may possibly be some word-final clusters which do not exist and which also cannot be predicted by Balcı's (2006) list.

[29] Balcı (2006) observes that *m* and *n* cannot be in the right onset of the clusters after consonants except for *r* and *l* but he does not provide a theoretical explanation for this phenomenon (Balcı 2006: 99).

The possible non-existing clusters that can be generated according to the list provided by Balcı (2006) need to be re-examined. In order to test the correctness of the possible non-existing consonant clusters which can be generated by his list, Balcı tests a mere four out of the fifty-four and six others which are supposed to be unacceptable according to his list (Iskender 2008: 129). Besides the four un-acceptable clusters, which he mentions, there may be other possible non-existing clusters.

The elemental compositions of the consonants are required in order to be able to explain possible inter-onset relations. Overall, Balcı's (2006) list and proposals are a serious attempt to predict these relations. However, due to a certain lack of analysis and to certain limitations in Balcı's list, a hierarchical list from Iskender (2008: 130) will be substituted instead. This list can be used to predict possible inter-onset relations.

2.3.2.3.2. A Government Index

Iskender (2008) provides a hierarchical list of consonants which can be used to predict possible inter-onset relations. This list does not divide the consonants into possible governors or possible governees. Instead, it simply observes the relative governing powers of the consonants, relative, that is, to one another. For this thesis, a hierarchical list seems a more convenient tool to use than a list which strictly divides consonants into possible governors and possible governees. Also, using the hierarchical list allows for the determination of possible inter-onset relations without

the need to refer to the elemental compositions of the consonants. In this respect, it makes the task of predicting the possible inter-onset relations clearer.

The hierarchal list provided by Iskender (2008) is as follows:

(38) Government Index for Turkish

(i) the glide y (j in IPA)

(ii) the rhotic r

(iii) liquids

(iv) nasals

(v) fricative obstruents

(vi) non-fricative obstruents (Iskender 2008: 130)

Based on his observations, Iskender (2008) finds that the inter-onset relations in Turkish are in conformity with this hierarchical index. The hierarchical government index for Turkish shown above lists the types of consonants in order of the ability to be governed. Since governing is always a relative property, the best way to describe this list would be to say that the better governors are the more complex segments and the better governees are the less complex segments. A less complex segment can be governed by an equally or more complex segment than itself. The governor must have at least as many elements as the governee in a government relationship in order to be able to govern it (Harris 1990: 273-274). The hierarchical government index above is in this relative order.

In Turkish, all of the word-final consonant clusters form a right-to-left inter-onset relation. This means that the consonant on the right hand side governs the consonant on the left hand side. Also, it means that it must have an equal number or more elements than the possible governee.

According to the government index provided by Iskender (2008), it appears that the less complex elements are the better governees. In other words, there seems to be a parallelism between the complexity values of the consonants and the order in which they occur in the hierarchy of the government index (Iskender 2008: 131). Iskender (2008) provides another hierarchical representation of possible governees, using standard IPA symbols (< stands for "good governee for"):

(39) j < r < l, ɫ < n, m < z, ʒ, v, s, f, ʃ, h < b, d, g, ɟ, p, t, k, c, ʤ, ʧ

(Iskender 2008: 131)

It is important to note that the best possible governee, which takes its place at the highest position on the government index *j*, is very rarely observed in consonant clusters in Turkish. Also, a few of the consonants which are the least possible governees, the voiced stops b, d, g, and ʤ, do not occur word-finally except in certain circumstances. From this it can be seen that *b, d, g, ɟ* and *ʤ* cannot be members of consonant clusters except in a few examples such as *cezb* "traction", lord "English nobleman", *şezlong* "chaise-longue" and *genc* "treasure" in which they are preceded by certain consonants which allow for these exceptions (Iskender, 2008).

As was mentioned earlier, *j* is very rarely observed in consonant clusters in Turkish. With respect to this, the most common possible clusters in Turkish therefore consist of *r, l* and *ɫ* in the position of governee. Likewise, the most complex level consonants act as the governor. This is observed in accordance with the government index described above. This can be illustrated briefly by the following examples:

(40)	*alp*	'hero'	
	alt	'underside'	
	ark	'canal'	
	art	'sequel'	(Iskender 2008: 132)

In this useful list of examples, it is evident that the consonant clusters that are made up of consonants which are on different levels on the hierarchy, do not allow an intervening vowel between them. Clusters formed of this type of opposite consonants are strong and cannot be broken up. In practice, it is not possible for the above words to contain an intervening vowel although their forms are possible in Turkish such as like *alıp, arık, alıt* and *arıt*.

On the other hand, clusters that are made up of consonants that are on neighbouring levels on the hierarchy have a weaker bond and may allow intervening vowels. In addition to this, clusters made up of consonants at the same level on the hierarchy cannot form a word-final consonant cluster in Turkish at all. There is an

exception, however, since the segment s can violate the government index (Iskender, 2008).

Following on from this, when the consonants are at the same level they cannot form an inter-onset government. In other words, inter-onset government is impossible between the consonants that make up the supposed cluster. Iskender (2008) uses the following examples to illustrate the inability of consonants of the same level to form an inter-onset government:

(41) *çaput* ~ **çapt* ‘patch’

demín ~ **démn* ‘just now’

havuz ~ **havz* ‘pool’

Hitit ~ **Hitt* ‘Hittite’

vasıf ~ **vasf* ‘quality’ (Iskender 2008: 133)

None of the above forms without the intervening vowel can possibly exist in Turkish despite the fact that the forms **havz* “pool” and **vasf* “quality” are existing words in the source language, Arabic. All of the clusters, **pt,*mn, *vz, *tt* and **sf* are impossible in Turkish. On the other hand, there are four recent loanwords in Turkish which include a cluster of the same level, *kt*:

(42)	*antrakt*	'entractes'
	efekt	'effect'
	katarakt	'cataract'
	pakt	'pact' (Iskender 2008: 135)

The above loanwords from French are infrequent in Turkish. They all contain contain the consonant cluster *kt*. It is apparent from the list of examples above that the *kt* clusters cannot be broken up by an intervening vowel. This could be due to the relative recency of the words. Older loanwords such as **vakt* ~ *vakit* "appointed time", from Arabic, do require an intervening vowel. According to Iskender (2008), the aforementioned borrowed word is an exceptional case in Turkish. It violates the government index proposed by Iskender (2008). Despite this, the occurrence of the intervening vowel in the *kt* cluster can be explained by the Complexity Condition.

The Complexity Condition allows a governing relation even when both of the consonant segments contain the same number of elements i.e. they are on the same level on the government index. With regards to the *kt* consonant cluster, the segment *k* (H.ʔ) has fewer elements than the segment *t* (H.A.ʔ). Therefore, segment *k* is a good governee to be governed by the segment *t* in the *kt* cluster. This is all in accordance with the government index.

However, the four exceptional examples listed above may be attributed to the fact that there is now an increasing tendency in Turkish to allow a greater variety of consonant clusters in word-final positions in Turkish (Iskender 2008). Clusters are formed from segments made up of consonants from different and more distant levels

are more common than clusters formed from segments at neighbouring levels. When the segments of a consonant cluster are of a similar level on the government index, and therefore have similar governing powers, the vocalisation of the empty nucleus between the two onsets may be triggered. In other words, the empty nucleus between two onsets, which have similar governing powers, may be realised and vocalised. Iskender (2008) provides examples of these also:

(43) *ast* 'inferior in rank'

arabesk 'arabesque'

gasp 'usurpation' (Iskender 2008: 135)

The first rightmost segments, *t, k* and *p* are good governors for *s*, in accordance with the government index. Examples of this type of government can be seen in (33) above. The reason why *s* was said to be able to violate the government index was because *s* can also govern the consonants at its own level. Also, it can even govern consonants at the rightmost level. Examples of this can be seen in the following:

(44) *nefs* 'one's bodily appetites'

raks 'dance' (Iskender 2008: 136)

According to the government index, none of the obstruents are good governees for *s*. The segments k and p occupy the rightmost level on the index and segment *f* shares the same level with segment *s*. Therefore, as a violation of the index, the reverse consonant cluster forms *ps* and *ks* are expected to form and they do. In fact, they are a perfectly grammatical occurrence in Turkish.

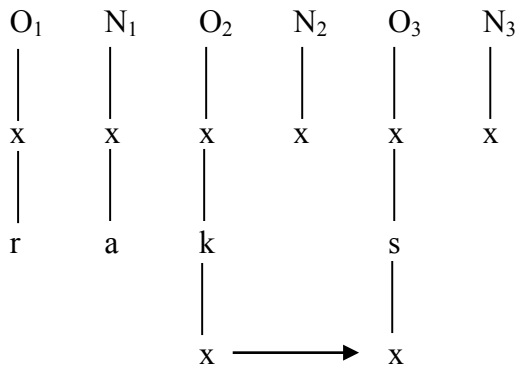
The behaviour of the consonant *s* has been a much investigated area of phonology. The consonant is known to have "strange properties" so it should not be so surprising that it violates the government index provided by Iskender (2008). The unusual properties of *s* have been noted by Kaye (1992). In his study, Kaye (1992) discusses the left-headed #sC sequences in which s precedes a consonant which is more complex than itself - as in the English word "stop". Kaye (1992) proposes a theory called Magic Licensing. Magic Licensing is used to explain the p-licensing of a nucleus that occurs before a consonant cluster containing the segment s. Within this theory, *s* is assumed to be in a rhymal complement headed by an empty nucleus. However, there does not seem to be a source of p-licensing for the empty nucleus in question. Despite the absence of a source of p-licensing for this empty nucleus, the nucleus still manages to remain silent. It is the silence of the nucleus which remains, despite the absence of a source of p-licensing, which is explained by Magic Licensing (Kaye 1992: 306-307).

Although the extraordinary circumstances under which segment *s* occurs are domain-initially, there are also instances where *s* demonstrates its remarkable properties domain-finally and cross-linguistically. An example of this is observed in Swedish where unusual clusters which contain *s* can exist (Engstrand and Ericsdotter 1999: 49).

This section has reviewed the inter-onset government relation that occurs between the word-final onsets that form a consonant cluster in Turkish. The inter-onset government can occur right-to-left and left-to-right. In Turkish, it occurs from right-to-left. However, in other languages such as Polish, the inter-onset government occurs from left-to-right as discussed by Gussmann and Kaye (1993).

If left-to-right inter-onset government is possible, as it is in Polish, perhaps it is possible to agree with Iskender's (2008) claim that left-to-right government also occurs in Turkish but only for the sequences in which s is preceded by an obstruent. Iskender (2008) provides the following representation to illustrate the reverse relationship that is applied in the special case of a sequence containing *s*:

(45) *raks* 'dance'



(Iskender 2008: 136)

The difference in the direction of the inter-onset government in cases such as these may be due to the special and unique properties s possesses. It is possible to suggest this since s remains the only consonant to behave differently in similar cases cross-linguistically. Besides the reverse behaviour of *s*, the government index proposed in this subsection is valid for word-final consonant clusters in Turkish.

This subsection has described the occurrence of word-final consonant clusters in Turkish. It provides an explanation behind their behaviour using the government index hierarchy proposed for Turkish by Iskender (2008). This section looks at consonant clusters in Turkish. Both word-internal and word-final clusters are discussed[30]. The following section will address word-final consonant alternations and consonant harmony.

2.3.3. Consonant Harmony and Alternations

As mentioned previously, there are two types of harmony in Turkish: vowel harmony and consonant harmony. Consonant harmony in Turkish occurs in order to make speech more fluent and it does not have an effect on the meaning of the word as vowel harmony does. As with vowel harmony in Turkish, consonant harmony has a set of rules by which it exists in the language.

There are two types of consonant harmony in Turkish. The first is when the last consonant of a word changes in accordance with harmony and the second is when the first consonant of the attached suffix changes accordingly. The former type of consonant harmony is called word mutation and the latter is suffix mutation. These will now be discussed respectively.

[30] I have only discussed word-internal and word-final clusters. It is widely accepted in the literature that phonetically adjacent consonants in word-initial positions are not permissible in Turkish. Indeed, it is claimed that loanwords are pronounced with an intervening vowel in Turkish like in *tiren* instead of *tren* "train". However, there are also different approaches to this issue. See Iskender (2008: 91-96) for details.

Consonants which are "harmonised" are: *p*, *ç* and *t*[31]. Harmonisation occurs when a word ends in either one of the aforementioned consonants and the suffix, which is attached to this word, has an initial vowel. The changes occur as follows:

(46) p → b

ç → c

t → d

In some words, ending in one of the above voiceless consonants *p*, *ç* and *t*, this final consonant changes to its voiced counterpart before a suffix beginning with a vowel. This is also called voicing. However, in literature, the voiced consonants are regarded as the underlying forms. Indeed, some of these alternations take place in loanwords from Arabic where the word originally ends in a voiced consonant[32] (Göksel and Kerslake 2005: 14-15). In this case, the process is more like devoicing. See the following:

(47) *[kita:b]* → *kitap* 'book

[ta:c] → *taç* 'crown'

[Arab] → *Arap* 'Arab'

[31] There is also k/zero alternation at the end of certain words. However, since this is not related to loanword adaptations, I will not cover this. One can see Iskender (2008) for details.

[32] Note that besides loanwords, consonant harmony can also occur in Turkic words (Göksel and Kerslake 2005: 15). For example, *kanat* "wing" becomes *kanad-a* "to the wing".

In (45), the left column represents the original forms in the donor language. All three loanwords from Arabic have a voiced consonant word finally. Turkish does not have any of these three voiced consonants *b*, *d*, *c*, in word-final position. Hence, they alternate into their voiceless counterparts. The original voiced consonant is retained when it is followed by a suffix beginning with a vowel.

Word mutation as a result of consonant harmony has been discussed above. Now, suffix mutation as a result of consonant harmony will be examined. There are two conditions that must be satisfied in order for suffix mutation to occur. You must have a word which ends with one of the following consonants: *p, ç, t, k, f, h, s, ş* and the suffix attached to this word must begin with either the *c* or *d* consonants.

When a suffix with an initial *c* or *d* consonant is attached to a word with a final consonant that is one of the following: *p, ç, t, k, f, h, s, ş*, the first consonant letter of the suffix changes (hence the name given to this type of consonant harmony: "suffix mutation"). The initial consonant of the suffix changes as follows: *c* becomes *ç* and *d* becomes *t*. This type of consonant harmony is exemplified below:

(48)	*Türk*	'Turkish people'	*Türkçe, *Türkce*	'Turkish language'
	yap	'do'	*yaptı, *yapdı*	'he/she/it did'

This section summarises consonant harmony and alternations very briefly. The following section will address syllable structure in Turkish.

2.4. Syllable Structure

The structure of a syllable in Turkish is either CV or CVC. In simpler terms, it is CV(C) which is also the template for a minimal word in Turkish[33]. The syllable in a word is made up of a consonant followed by a vowel and in some syllables the vowel is then followed by another consonant. In the terms of Government Phonology (GP) this minimal word form or, for want of a better term, "minimal phonological structural unit" is an "onset-nucleus" pair (Denwood 2006: 466). In this section, the syllabic structure of Turkish in morphophonological terms is revealed according to, and within, the GP framework.

The onset-nucleus pair, which constitutes the minimal phonological structural unit in Turkish, (i.e. syllable) is subject to universal principles. These universal principles state that every nucleus can and must license a preceding onset and, in turn, every onset must be licensed by a following nucleus (Denwood 2006: 467). As is mentioned in Chapter 1, within the GP framework, phonological structural units are "drawn" with every "point" called a "skeletal point". The universal principle also states that every constituent licensor must dominate a skeletal point (Denwood 2006: 466).

[33] The four exceptional words, *su* "water", *bu* "this", *şu* "that", *o* "that" are historically words ending in a consonant as in *suy*, *bun*, *şun* and *on*.

2.5. Stress

This section discusses the occurrence of stress in Turkish. According to Underhill (1972) and Lewis (1967), stress is most accurately described as a pitch accent, in other words a high tone on the accented syllable. In Turkish, the main stress usually regularly occurs on the last syllable of a word except in certain circumstances such as in some loanwords (particularly European loanwords especially from Italian and Greek) For example, place names such as *'Ankara*, adverbs e.g. *ikti'saden*, and suffixes with inherent stress. It is important to note that the typology of the stress system in Turkish is a quantity-insensitive, fixed stress system. This is because the differences in syllable structure have no role for the assignment of regular stress although the location of regular stress is predictable (Hulst and Weijer 1995: 505).

Besides regular final stress, which occurs on the last syllable of a word in Turkish, there are also different stress patterns for some words such as proper names of people and places as mentioned previously. In the literature, this type of stress is called Sezer stress after its discoverer Engin Sezer. Before Sezer (1981a), it had been believed that if a word does not have a regular stress at the end, then it is impossible to predict the place of stress in a given word. It is just a random occurrence and needs lexical information.

Sezer (1981a) has shown that for certain words without word-final stress, syllable structure can be used to predict the stress. Sezer stress covers areas such as penultimate stress and antepenultimate stress in words. Penultimate stress occurs

when the penultimate syllable of the word is heavy and the antepenultimate syllable is light e.g. /*a'da.na/ Adana*, */an'tal.ja/ Antalya* and /*is'tan.bul/ Istanbul*. The conditions are vice versa for antepenultimate stress e.g. */'an.ka.ra/ Ankara*. The Sezer stress patterns contrast with the regular stress pattern in Turkish. This is due to the fact that regular stress occurs on the final syllable of a word in Turkish, whereas Sezer stress does not. Sezer stress occurs on either the first or medial syllable of a word.

To reiterate, regular stress pattern in Turkish occurs on the final syllable of a word. This includes words with suffixes attached to them. Turkish is a naturally agglutinative language. Thus, a numerable amount of suffixes may attach to the end of a word. What happens to the regular stress pattern when suffixation occurs? The regular stress pattern merely shifts onto the new final syllable of the attached suffix. As a result, the stress is always on the final syllable of the word if it is following the regular stress pattern in Turkish.

This thesis looks at the phonology of Arabic loanwords in Turkish. If Turkish has the regular stress pattern on the final syllable of a word then, in the majority of cases, the Arabic loanwords in Turkish must have adapted to this pattern thereby also having their regular stress pattern on the final syllable of the word. However, as previously mentioned, the regular stress pattern may have instances where it is not observed such as in loanwords. In this case, Arabic (and also Persian) loanwords differ from their European counterparts in that the former have mostly regular stress whereas the latter ones have irregular stress in most cases. This is probably because they are recently borrowed and have not had enough time to adopt the properties of the recipient language.

CHAPTER 3: LOANWORD ADAPTATIONS

3.1. Introduction

This chapter summarizes the current approaches to the issue of loanword adaptation by focusing on the phonological properties of Turkish. A loanword is a word which is adopted from a foreign language with little or no modification. In other words, it is a word which is borrowed from another language and whilst it does undergo some phonological change in order to be used efficiently within the borrowing language, its behavior is such that it remains faithful to its origins and changes as little as possible from its original form in the source language. According to Paradis (1996) and Kenstowicz (2001), loanwords are lexical items which originate in one language and used in conversation of another language to fill in some "semantic void" (Cohen 2009: 14).

Loanwords are the words of one language, often referred to as the "donor" or "source" language, which enter the lexicon of another language, that is the "borrowing" or "recipient" language, essentially without translation. Although loanwords are said to be "borrowed" by one language from another, the recipient language takes this word but does not "return" it or give some other word in return.

It is worth noting here that the term “borrowing” is used here metaphorically rather than literally. There are a limited number of reasons why a loanword is borrowed by a receiving language. These include instances where a new concept is introduced into a language and brings with it the need for new words to allow speakers to make distinctions which would, otherwise, be impossible. For example, the ability to distinguish between different types of cars or houses. The process of borrowing often takes the form of adopting from a “higher status” into a relatively “lower status” language. “Status” may be defined in terms of culture or wealth. An example of a minority language borrowing from a dominant language can be seen from the Turkish speakers in the Turkish-speaking minority population in Germany who borrow numerous words from German, the dominant language. A few specific examples of the way in which the word of a donor language may enter a recipient language are given below.

3.2. Donor and Recipient Languages

A word often enters a new language through the use of bilingual speakers who act as a medium for passing words between two languages. In other words, borrowing is a consequence of contact between two language communities and this often comes in the form of cultural contact. Such contact usually involves two language communities speaking a minimum of two languages.

The strength, power or prestige of a language may be the deciding factor in determining which language will be the donor and which will be the borrowing or

recipient language. The properties of the particular language at hand may affect the lexical item that could potentially be borrowed into the recipient language. This may involve the possibility of making objects denoted by a particular lexical item seem more desirable or appealing even, perhaps, more useful.

A word is often borrowed by a recipient language when it is a term connected to an exposure to a foreign culture. These loanwords enter the recipient language in order to provide a medium through which speakers of the recipient language may be able to refer to the foreign entity denoted by that borrowed lexical item. Many Arabic loanwords were adapted into Turkic languages after the Turkic tribes embraced Islam. Thus words such as *dua* “praying”, *sure* “chapter of Quran”, *cennet* “paradise”, which were associated with the new religion, were borrowed from Arabic.

Exposure to a foreign culture needs not be linked to religion. It can occur when one culture is exposed to another culture’s art, science, business etc. For example, in Turkish, the use of the word *stil* to mean “style" has increased over recent years slowly replacing its older semantic counterpart *tarz* “style” which, in turn, is a loanword from Arabic. This type of change can be linked to the widespread use of the internet and other media such as news networks. This increased use of modern media has led to the adoption of new and foreign words via the exposure of one culture to many cultures. For example, when television came into more general use in the 1940’s and was subsequently brought to Turkey in the late 1960s, the lexical item *télévision* “television” in French was borrowed by Turkish, the recipient language, and adapted to Turkish to become *televizyon*.

It is important to note that in some literature it has been stated that in the case of bilingual speakers a “foreign word” only becomes a “loanword” when the recipient language is fully deactivated. This is because bilinguals have the benefit of knowing both languages and using them. In the borrowing process of a “loanword”, bilinguals may not have fully deactivated their second language (i.e. recipient language spoken using the borrowed word). This leaves unanswered questions as to how and where to draw the line in identifying a loanword. The complete deactivation of the recipient language can ensure that the lexical item has become a loanword (Paradis and LaCharité 1997). The following subsection discusses this issue further.

3.2.1. Foreign Words vs. Loanwords

Crucially, not all imported words are loanwords. Words imported into the recipient language can be divided into two main categories:

(1) i. Foreign words which are words imported from the donor language but are non-integrated. This means that they do not attempt to integrate into the recipient language. “Foreign words” are not the subject of this thesis and will not, therefore, be dealt with in any depth.

ii. Loanwords, which are words imported from the donor language but which are integrated into the recipient language. The orthography, phonology and semantics of the loanwords are adapted to the recipient language.

The borrowing process, during which a word from one language enters into another language, is both long and complex and involves various steps or stages. Haunz (2007) describes these stages as varying "degrees" during which a loanword may be part of the borrowing language's lexicon. The stages begin from a level where the speaker has no knowledge of the source language to a level where the loanword has been an integral part of the recipient language for centuries (Haunz 2007: 4). The borrowing process is divided into three stages by Haugen (1950) (quoted in Paradis and LaCharité (1997)):

(2) i. The pre-bilingual period; where only a small number of adults are bilingual and there is a high degree of variability in the adapted forms of the loanword.

ii. The adult bilingualism period; where most adults are bilingual and the adapted forms of the loanword show increased uniformity.

iii. Childhood bilingualism, where children grow up bilingually and thus do not have to learn the second language as adults.

However, loanwords do not only enter a language through mere bilingualism. Monolingual speakers may use and adopt single lexical items from a foreign language without having acquired or being in the process of acquiring the source language (Haunz 2007: 4). Thus, borrowing may occur more or less depending on the number of the bilingual population in the borrowing language. If there are enough people who know the meaning of a given foreign word, then the process of

loanword adaptation can work. Knowledge of the source language may influence the number of adaptations that a loanword has to go through once borrowed.

Changes that occur to the loanword, due to adaptation, include many linguistic aspects such as the phonological, segmental, syllabic, morphological and morphophonological aspects. Loanword adaptations have been an area of interest for a long time for phonologists. To reiterate, loanwords undergo adaptation processes in order to survive in the phonological environment of the borrowing language. Current approaches to the issue of loanword adaptation will be summarized within this chapter by focusing on the phonological properties of Turkish. Focusing on the phonological properties of Turkish itself will allow for a better understanding and analysis of the phonological adaptation loanwords undergo when borrowed by Turkish.

Loanwords may be identified by the changes mentioned above. They may be identified by the differences they possess in comparison to native words of the borrowing language. The differences between loanwords and native words arise are attributable to the changing processes a loanword has to go through in order to adapt to the recipient language. Through distinguishing these marked changes in words and their differences (be it segmental, syllabic, allophonic distribution or a non-native stress pattern) a loanword in a borrowing language may be identified.

The type of changes the loanword undergoes is determined by the inventory of the borrowing recipient language (Haunz 2007: 3). Any changes that are made to the original form of the loanword, when borrowed by a recipient language, are merely a result of the natural behaviour of language. When a new word enters the

lexicon of a native language, adapting to native linguistic patterns is essential for its survival. For example, the first time a refrigerator was brought to Turkey in the 1930's, it was called a *refijiratör*, an adapted version of the French word réfrigérateur "refrigerator", or *frijider*, from the name of the popular early refrigator brand manufactured in the United States – *Frigidaire*. This however, did not fit in smoothly with Turkish and was later replaced with a calque translation from the US "icebox", *buzdolabı* "refrigerator".

This study of loanword adaptation in Turkish will focus on the phonological changes, effects and patterns that occur. The types of adaptation a loanword undergoes, when borrowed by the recipient language, include changes to its meaning (semantic), spelling (orthographic), pronunciation (phonetic), syllabic structure (phonotactic), phoneme distribution (phonemic) and stress position (prosodic). The types of adaptation that a loanword undergoes are discussed in the following sections along with the various methods of identifying of a loanword.

3.2.2. Reborrowing

Reborrowing is a situation where a word is first borrowed by a language from the source language. The word then adapts to the borrowing language. In other words, it changes. Once it has changed, it is reborrowed by the source language (Crawford 2009: 93). For example, the Turkish word *ücra,* which means "remote", was once *uçra* but it was borrowed by Persian and changed after it was reborrowed from Persian by Turkish. Although changes do occur to its original form to allow it

to integrate, a loanword will still often differ from a native word in some way or another. The methods of identifying a loanword are examined in the following section.

3.3. How to Identify a Loanword

We have already seen that the borrowing process a loanword undergoes induces one or more changes to the original form of the word. One or more changes may be inflicted upon the particular word, depending on the inventory of the recipient language. Examples of this include scenarios where a phoneme is lacking in the recipient language's inventory and thus a change has to be made to the borrowed word in order for it to be used and understood amongst speakers of the recipient language.

In addition to phonemic adaptation, other types of adaptation include a change to the phonetic, phonotactic or prosodic characteristics of a word (Haunz 2007: 3). The different types of loanword adaptations are explained below since loanword adaptations and, more specifically, identifying them (on a subconscious, intuitive level by listeners or at a conscious analytical level by linguists) allows for easier identification of the loanwords themselves.

According to Haunz (2007), phonetic differences arise between the loanword and its original form.While the phoneme is transcribed identically in both the loanword and its original form, they are different phonetically. They are pronounced differently to one another. This phonetic difference (or difference in pronunciation)

has to do with the particular environment in which the phoneme occurs. In this case, its occurrence in a loanword of a borrowing language, among unfamiliar and foreign sounds, puts pressure on it to conform and adapt to its environment. In doing so, it changes phonetically making it different, in this regard, to its original form in the donor language. As an example of a phonetic change Haunz (2007) uses the word *souvenir* "memento". He says the first vowel of the French pronunciation of the word *souvenir* and its adapted form as a loanword in English are both transcribed as */u/*. However, they are pronounced differently. That is to say, they are phonetically different, although transcribed the same.

Another type of adaptation are phonotactic restraints. Sometimes, the phonotactics of the borrowing language do not allow certain sounds or combination of sounds as they occur in the loanword. Thus, the loanword must adapt to the borrowing language and by altering its phonotactics. The Turkish word *Mısır* "Egypt" is a good example of this. Unlike in Arabic, the word final *sr* cluster is not possible in Turkish so the Arabic word *Mısr* changes into *Mısır*[34]. It is a change that occurs at a syllabic level.

On the other hand, a word may not undergo this adaptation and will thus remain in the recipient language with its unusual syllabic structure. This enables it to be intuitively identified as a "foreign word" (or a "borrowed lexical item" for want of a better term) by speakers. In fact, this is one of the main ways in which a loanword may be identified in a language.

Phonemic changes which occur when the borrowing language's inventory is lacking a phoneme which exists in the original form of the loanword (Haunz 2007:

[34] The reader is referred to 2.3 for a detailed survey within the GP.

3). For example, there are sounds, especially consonants in Arabic, which are not available in Turkish. These are, therefore, changed with other sounds which are similar to the original sounds.

Prosodic adaptations must take place when the stress of a loanword is marked differently to the usual stress position of words in the borrowing language. The loanword, therefore, undergoes a prosodic adaptation during which the stress position changes on the word. This happens so that the loanword becomes more easily recognised by listeners of the recipient language (Haunz 2007: 4). As mentioned in 2.5, the stress position of Turkish words is usually word-final but for certain loanwords in Turkish, such as *'depo* "depot" and *'kilo* "kilo" from French, the stress position is not word-final. Note that most of these irregular words are recent loanwords from European languages. Loanwords from Arabic, on the other hand, obey the stress pattern in Turkish.

A summary of the ways in which a loanword may adapt to the borrowing language, as described by Haunz (2007), is given below for ease of reference:

(3) i. Phonetic changes:

Loanwords may change phonetically when borrowed by a recipient language. They may be phonetically different from their original form because of pronunciation differences in general between the donor and recipient languages.

ii. Phonotactic changes:

Loanwords may have to change their phonotactics according to, and in order to adapt to, the borrowing language. Some sounds, or a combination of sounds, which were allowed in the original donor language may not be allowed in the

recipient language and therefore must change. This is a change that occurs at the level of syllabic structure.

iii) Phonemic changes:

The borrowing language may be lacking a phoneme in its inventory which occurs in the loanword. Thus, it substitutes other phonemes into the loanword for those that are lacking in its inventory.

iv) Prosodic changes:

The stress position of a loanword may have to change, according to the normal stress position of the borrowing language, in order for it to be better recognisable by speakers of that language.

Of course, the above adaptations do not happen at random but rather they happen under the influence of certain factors which affect how adaptation occurs. These factors will be discussed later in the work.

Loanwords may be identified in a recipient language by the changes that occur to them as briefly discussed above. This is the short answer to a much more complex and diverse topic. "Identifying a loanword" can be split into two major categories: i) The identification of a loanword by native speakers and ii) The identification of a loanword by a linguist.

To know how a loanword is identified by a native speaker is essential for linguists when analysing loanword borrowing and adaptation. The intuitive knowledge of a native speaker can provide a lot of answers to unanswered questions.

Therefore, this first major category of identifying a loanword will be discussed in more detail than the second category which involves mathematical and statistical data.

Native speakers of a language have an intuitive knowledge of what is or is not considered to be an acceptable borrowing (Holden 1976). Generally, it has to do with a slight difference in the loanword to the native word such as its non-native syllabic structure or segmental distribution. There are a number of ways in which a borrowed lexical item may be identified. However, it is perhaps a good moment to point our here that Cohen (2009) notes that it may be the simultaneous occurrence of several of the criteria in a single word which classifies "the word in the speaker's mind as foreign" (Cohen 2009: 12).

If we were to take on board what Cohen (2009) tells us, we may deduce that if several of the types of adaptation described above occur in a word this allows speakers and listeners to identify this word as foreign. Although it may be the "simultaneous occurrence" of several "criteria" in a word which allows a speaker to identify it as "foreign", it is not limited to this. There is also the possibility, depending on the languages involved and the circumstances, that it may take only one type of adaptation in a loanword for a speaker to be able to identify it as a foreign, borrowed word. Cohen (2009) then lists the criteria by which a word may be classified as "foreign" by native speakers according to Schwarzwald (2002):

(4) i) Segmental distribution: sometimes, a loanword may contain a segment which is non-native. The existence of this non-native segment allows native speakers to identify a word as foreign because of the relatively rare occurrence of this segment in their own native language.

ii) Atypical allophonic distribution: loanwords may also contain differences in the distribution of allophones within a word. An allophone which usually occupies a particular position within a native word of the recipient language may not be positioned in the same way within a loanword. An allophone which usually occurs at the end of a native word may be distributed to the middle of a loanword.

iii) Non-native stress: the stress position on a loanword may be different to the usual stress position that occurs in the recipient language.

iv) Non-native syllabic structure: loanwords may have a different syllabic structure compared to the native recipient language. This is called "non-native syllabic structure" (Schwarzwald 2002: 24, Cohen 2009: 12-13).

As mentioned earlier, the syllabic structure of words in Turkish, for example, is typically CVCV. Most of the consonant clusters are not native to the Turkish language. However, when a word is borrowed and integrates into Turkish, i.e. becomes a loanword, it may still retain its original syllabic structure making it distinguishable as a loanword among other native Turkish words.

Below is a table comparing the types of adaptation from Haunz (2007) and the types of differences a loanword may have compared to a native word by Schwarzwald (2002):

(5)

Types of Adaptation of a Loanword (Haunz 2007)	*Types of Differences of a Loanword (Schwarzwald 2002)*
Phonetic changes	Segmental distribution
Phonotactic changes	Non-native syllabic structure
Phonemic changes	Atypical allophonic distribution
Prosodic changes	Non-native stress

On the one hand, there are the types of adaptations of a loanword and on the other there are types of differences of a loanword compared to a native word. The two categories are intertwined. The types of adaptation - or lack of - give rise to the differences in a loanword. Although Schwarzwald (2002) and Haunz (2007) discuss similar scenarios they are dealing with different things; one is looking at how a loanword changes when borrowed by a recipient language and the other is looking at how different a loanword is compared to a native word. In spite of this, both tables cover the process of identifying a loanword within a language.

A loanword may be identified by noticing the segmental, phonetic, phonotactic, phonemic and prosodic differences between it and a native word. Native speakers and listeners will do this intuitively. However, those without an intuitive knowledge of the borrowing language may study the types of adaptations and may identify the loanwords by looking out for words that bear the results of those adaptations.

3.4. Orthographic Influences on Adaptation

Orthography is the conventional spelling system of a language. The orthographic influences on adaptation deal with the conventional spelling systems of both the donor and recipient languages and how this may influence the adaptation of loanwords. The orthography of a word may influence the changes that occur to the loanword once borrowed by a language and how it adapts to the borrowing language. The orthographic influence on adaptation is just one of many factors that may influence the way a loanword adapts to the borrowing language (Crawford 2009: 89-94).

Loanword adaptations are traditionally analysed as phonologically minimal changes that are determined by the grammar and linguistic information of the borrowing language. Several authors such as Silverman (1992), Yip (1993), Kenstowicz (2001, 2003) and Kang (2003), propose that some loanword adaptation actually takes place in the perception of the loanword and is based on phonetic distance. In fact, Peperkamp and Dupoux (2003) argue that all loanword adaptations result from perceptual assimilation (Peperkamp and Dupoux 2003: 368, Vendelin and Peperkamp 2006: 996).

Following the view that all loanword adaptations are a result of perceptual assimilation, Vendelin and Peperkamp (2006) conducted an experiment in which they tested the adaptation of English words by French speakers under oral-only and oral-written conditions. They examined whether the impact of perception might be "obscured by the role of orthography". In other words, they discussed whether the

orthography of a language has any influence on the adaptation of loanwords through the way they are perceived.

In their study, Vendelin and Peperkamp (2006) found that their French speaking subjects were sensitive to "fine phonetic detail" when they had to base their online adaptations of English vowels on perception only. When an orthographic representation was made available, Vendelin and Peperkamp (2006) found that the subjects used their learned knowledge of "grapheme-to-phoneme" correspondence rules. In other words, they found that their subjects relied solely on perception in the oral-only condition whereas in the oral-written condition the subjects applied a "grapheme-to-phoneme" correspondence rule -which they had knowledge of through attending foreign language classes (Dohlus 2005: 128) - using the orthographic representation provided.

Vendelin and Peperkamp (2006) deduced that subjects will more often produce the "between-language grapheme-to-phoneme adaptations" when an orthographic representation is present than when it is absent.

This on-line adaptation task was used to show that orthography does influence loanword adaptation. Just how much influence it has both Vendelin and Peperkamp (2006) admit is hard to measure. This is because (i) the adaptations based on phonetic proximity are "often indistinguishable" from adaptations based on "phonological and/ or phonetic minimality" which can lead to an underestimation of the influence of orthography (ii) orthographic influence cannot be excluded even for those words which are adapted on the basis of oral input only since the bilingual speakers recognise the words and have knowledge of their written form.

The authors also used “non-words” as a method of experiment but the participants noted the similarities to a real word and constructed an orthographic representation of the non-word nonetheless.

The two types of orthographically influenced adaptation the authors have addressed above are as follows:

(6) (i) ”reading” adaptations

(ii) adaptations based on between-language grapheme-to-phoneme correspondence rules.

Vendelin and Peperkamp (2006) claim that although in some cases the above two adaptation types are identical, in others they are different. This difference makes it difficult to examine them separately. As a result of their experiment, Vendelin and Peperkamp (2006) deduced that the orthography of words enabled faithful perception because it was hinting to the source phoneme and, as a consequence, triggered phonological approximation (Vendelin and Peperkamp 2006: 1004). When an orthographic representation of the word is provided the perception of that word thus becomes secondary due to the knowledge of the source’s written form (i.e. orthographic representation) (Dohlus 2005: 128).

In opposition to the view expressed in Vendelin and Peperkamp (2006) - that the orthography of words does influence the adaptation of a loanword – Paradis and LaCharité (2005) state that orthography played only a limited role in the database they collected. They, therefore, conclude that: “Despite what is often believed, the

clear influence of orthography is generally weak" (Paradis and LaCharité 2005: 237).

Although Paradis and LaCharité (2005) cite their differences by believing that orthography has a weak influence on loanword adaptation, many authors in addition to Vendelin and Peperkamp (2006) have argued otherwise (other authors include Dohlus 2005, Smith 2006, Detey and Nespoulous 2008). The latter authors have proposed that orthography does affect loanword adaptation patterns. The orthography of the lexical items has proven to be especially useful to adapters when other factors "underdetermine the adaptation pattern and the adapters are uncertain about the 'correct' pattern" (Kang 2011: 2265).

Cohen (2009) states that, in Hebrew, "there are cases in which there is no possible explanation for the existence of a segment and/ or its quality... other than the orthographic representation... of the word" (Cohen 2009: 18). Below this, he draws a table containing a list of the vowels and consonants that have been adapted by Hebrew from English with orthographic conditioning. Due to the difference in their orthographic representation, the identical phonetic forms of English vowels and consonants surface as different Hebrew forms. Thus the sole influence, in this case, on how the English vowels and consonants will surface is the orthographic representation.

Whilst loanword adaptation is mostly conditioned by grammatical factors, it can also be influenced by grammar-external factors such as orthography, the degree of bilingualism or the channel of borrowing (Kang 2011: 2276). The role of orthography's influence in loanword adaptation, as demonstrated by the experiment

of Vendelin and Peperkamp (2005), can behave as a mediating factor between perception and adapting phonotactically illegal structures (Schwarzwald 2002: 83).

Different authors claim different things regarding the influence of the role of orthography on loanword adaptation. The claims range from "generally weak" as stated by Paradis and LaCharité (2005) to claims that the loanword adaptation was influenced completely by the orthography of the lexical item in question (Cohen 2009: 18) This includes the result from Vendelin and Peperkamp (2006) that subjects will more often produce "between-language grapheme-to-phoneme adaptations" when presented with an orthographic representation of the words than without. They found that the orthography of words enabled faithful perception because of being able to hint at the source phoneme which, in turn, triggered phonological approximation.

In addition to these, there is also the view stated by Dohlus (2005), that when an orthographic representation of the word is provided the perception of the word becomes a secondary adaptation influence. Dohlus (2005) says that this is due to having knowledge of the source's orthographic representation of the words (Dohlus 2005: 128).

3.5. "The Passing of Time" Issue

Languages change and develop over time. There have been a vast number of languages all over the world which have changed, in some cases drastically, and in others not so much, as the decades have gone by. Since languages are subject to

change due to several influential factors from within their environment, it is only logical to assume that the borrowing/ recipient language changes over time. Thus, loanwords which have been borrowed from the donor language by the recipient language may also be subject to change over the years[35].

In other words, the loanword may become less and less faithful to its source language as it is used by the speakers of the borrowing language continually over time. The degree to which the loanword remains faithful to its original form in the source language depends on the phonological inventories and influences of the environment in which it happens to exist.

Basically, a loanword may reduce its faithfulness to its original form in the source language as time passes. With the passing of time the loanword becomes more and more subject and open to outside influences which make it difficult for it to retain its original phonological, semantic or syntactic properties. Thus, the chance of it changing, or adapting for want of a better word, increases dramatically (Crawford 2009: 15-16).

In addition to this, it is worth noting that the changes to languages, which occur over time, do not only affect loanwords. They affect all words of all languages to varying degrees. So if the recipient language changes with the passing of time, these changes will also affect the loanwords within that particular recipient language. As time goes on, the loanword becomes more and more an integral part of the recipient language and if it is used by speakers on a daily basis, it is especially

[35] Besides the phonological aspect of influence on loanwords, there are other aspects which may influence its phonology and faithfulness such as the geographic region in which it is spoken after being borrowed.

vulnerable to adapting to the recipient language. As a result, the faithfulness of the loanword to the source language declines with the passing of time.

3.6. Sociolinguistics Differences

This section will be discussing the sociolinguistic aspect of language borrowing and loanword adaptation. The area that will be examined, in particular, will be the fact that there are sociolinguistic differences between loanword adaptation types and how loanwords may change over time. The loanword may become less like its original form in the source language, thus its faithfulness to the source language will lessen due to sociolinguistic differences between the source language and recipient language.

Once a word is borrowed from one language to another, it is naturally subjected to a new and different environment. Socio-political and cultural factors have an influence on loanwords as do socio-cultural/ aesthetic values, language attitudes and the social conventions of loanword adaptation. These all play an important role in the process of borrowing (Weinrich 1953, Poplack, Sankoff and Miller 1988, Hock and Joseph 1996, Hualde 1999, Miao 2005).

The differences in the sociolinguistic contexts of the languages cause the loanword to adapt to its new environment, losing some of its similarity to the phonological characteristics of the source language. Loanwords usually integrate smoothly into the recipient language. They adapt to it in many ways. There are

adjustments to their orthography and pronunciation, sometimes so much so that they eventually have little or no resemblance to their original form in the source language, hiding their ancestry. In other words, a loanword's faithfulness to the source language diminishes along with the changes which occur to the loanword as a result of these sociolinguistic factor differences.

Loanwords which have been borrowed from a language which, in turn, has borrowed it from another language are subject to even more change. The fact that it has already been in a new environment, for example an Arabic loanword in the Persian language, means that it has already undergone some adaptations before it is borrowed by a final recipient language, let us say Turkish. Thus, the loanword is less able to be faithful to its original source language.

CHAPTER 4: THE PREDICTABILITY OF T-PALATALISATION IN TURKISH

4.1. Vowel Disharmony

As Clements and Sezer (1982) state, Turkish is a symmetrical vowel harmony language. That is to say, unlike asymmetrical vowel harmony languages like Somali, Turkish does not allow root vowels to be alternated. It is only vowels within the suffixes which alternate according to the quality of the nearest, that is, of the rightmost root vowel (Clements and Sezer 1982: 215-216). The vowels preceding the rightmost one have no influence on the suffix vowels. See the following:

(1)	*/insan-a/*	*[insana],*[insane]*	'to the person'
	/muhit-øn/	*[muhitin],*[muhitun]*	'of the environment'

The roots *insan* "person" and *muhit* "environment" are not harmonic: the elements I and U in the leftmost nuclei do not spread into the following nuclei. Importantly, if suffixes are added to these roots, the harmonic head will be the rightmost nuclei of the root. Hence, the forms **insane* and **muhitun* are

ungrammatical. Also note that the only way the vowel *i* in the root *muhit* can be accounted for is by the fact that the element I exists lexically.

In contrast to the old approaches, like that of Lightner (1972), most of the current linguistic studies on Turkish vowel harmony like Clements and Sezer (1982), and almost all recent ones, do not treat disharmonic roots as marginal exceptions. As Clements and Sezer (1982) show, because there are innumerable disharmonic roots in Turkish and some of them are even of Turkic origin, it is very difficult to classify them as marginal cases (Clements and Sezer 1982: 223-227).

Clements and Sezer (1982) also observe that although vowel harmony is highly regular within the suffixation process, the vowels *i*, *e*, *a*, *u* and *o* can disharmonically co-occur with each other in Turkish roots whereas the vowels *ü*, *ö* and *ı* can surface only harmonically (Clements and Sezer 1982: 227). This observation constitutes a distinction between root-internal vowel harmony and root-external vowel harmony which is a process between the root and suffixes. Following Clements and Sezer (1982), I also distinguishes between the two. Root-internal vowel disharmony and root-external vowel disharmony are evaluated, in turn, below.

As seen from the aforementioned examples, just as there are many roots which can be explained by I-harmony and U-harmony, there are also roots which do not exhibit these types of spreading. Crucially, these roots are still dependent on certain constraints.

As already mentioned, vowels in a suffix change according to the rightmost vowel of the root. Recall (1):

(2)	*/insan-a/*	*[insana],*[insane]*	'to the person'
	/muhit-øn/	*[muhitin],*[muhitun]*	'of the environment'

Although both of the roots *insan* "person" and *muhit* "environment" are non-harmonic words, the harmony process between the roots and the suffixes functions perfectly. As is expected, the rightmost vowels *a* and *i* in the roots *insan* and *muhit* are followed by *a* and *i* in the suffixes. In the former example, there is an element A in the elemental composition of the vowel *a* within the suffix and no spreading occurs because there is nothing to spread in the head of the harmonic domain *a*. In the latter, on the other hand, there is an I element in the domain head *i* and it spreads into the empty nucleus of the suffix *-øn*. Vowel harmony seems to work perfectly within the suffixation process. However, there are certain cases where it does not work. There are (i) disharmonic suffixes and (ii) palatal and palatalised consonants that create unexpected forms.

4.2. Disharmonic Suffixes

There are two kinds of disharmonic suffixes in Turkish: those that are originally lexical words, and used as suffixes in modern standard Turkish, and those that are unproductive or borrowed.

(3) (a) -(y)Abil, -(y)Iver, -(y)Agel, -(y)Adur, -(y)Akal, -(y)Ayaz, -Iyor, -gen, -ken

(b) -a:ne, -Daş, -(I)mtrak, -istan, -izm, -iyet, -gil, -ki, -leyin, -(t)en, -va:ri:, -(v) i: (adapted from Göksel and Kerslake 2005: 24 and Iskender 2007).

Since those in (3a) are derived from lexical words, it is possible to explain their disharmonic property by assuming that these suffixes are not in the same harmonic domain with the roots just as can be observed within compound words. Although those in (3b) are not derived from lexical words, the same assumption seems to be the only possible explanation: they are in a different domain and therefore (i) they do not undergo element spreading from the rightmost vowel of the previous domain as in *koşar-ken* "during running" and (ii) they can have vowels including I and U even if there is no I and U in the rightmost vowel of the previous domain as in *hukuk-i* "juristic". See the following:

(4)	*gel-iyor, *geliyür*	'he/ she is coming'
	*hatıra-ten, *hatıratan*	'as a reminiscence'
	*hukuk-i:, *hukukı*	'juristic'
	*insan-iyet, *insanıyat*	'humanity'
	*koşar-ken, *koşarkan*	'during running'
	*mavi-mtrak, *mavimtrek*	'bluish'
	*meslek-taş, *meslekteş*	'colleague'
	*onun-ki, *onunku*	'his/ hers' (Iskender 2007).

As can be seen, all of the expected forms are ungrammatical. The vowels of suffixes are not accessible from the root vowels. There seem to be two domains in a

word. This is actually a morphological case and is not related to our topic. The next section looks at the relationship between vowel harmony and the quality of consonants which is vital for the purposes of this study.

4.3. Palatal and Palatalised Consonants

The quality of root-final consonants may influence vowel harmony. Back vowels in the suffix, that is the vowels that do not contain the element I, can host I even though there is no I in the root vowels. In Turkish, there are palatal *l* and palatal *k* which are different from velar *l* and velar *k*. Nevertheless, there are no distinct letters for the two. See the following:

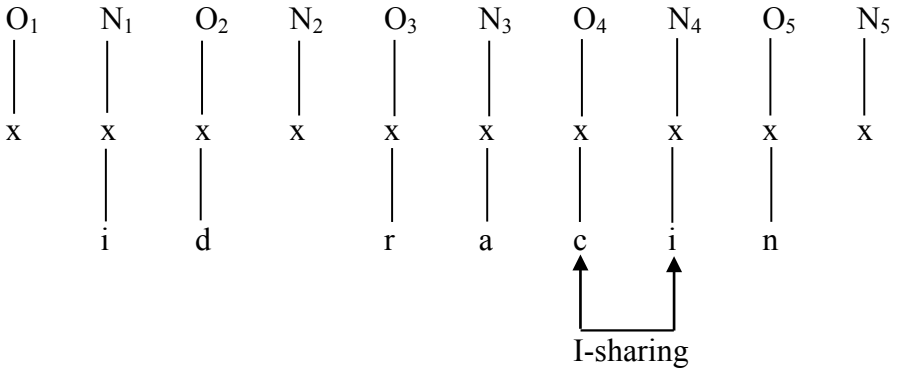
(5)	(a)	*kar*	*/kar/* (velar)	'snow'
		kar	*/car/* (palatal)	'profit'
	(b)	*sol*	*/sol̈/* (velar)	'left'
		sol	*/sol/* (palatal)	'sol in music'

When there is a palatal consonant at the end of a word, the vowel(s) of the suffix gets I even if there is no I in the root. See the following:

(6)	*idra:k-in, *idrak:ın*	'of the comprehension'
	*makbu:l-ün, *makbu:lun*	'of the acceptable (one)'

In (6), both of the roots *idrak* “comprehension” and *makbul* “acceptable” end in a palatal consonant. The reason why the expected forms **idrakın* and **makbulun* are inadmissible is directly related to the content of root-final palatal consonants. As mentioned in 1.1.1, the palatality of the consonants is defined by the presence of the element I (Harris 1990: 263). In their elemental composition, both /c/ and /l/ are assumed to have the element I and this element is somehow shared with the following nuclear position.

(7) */idrac-in/* ‘of the comprehension’



The segment /c/ includes the element I. The positions O_4 and N_4 share this element. It is in this sense that harmonic process interacts with the palatal consonants. The harmonic head is N_4 and if more suffixes are added to the stem, all of the following nuclei get their I element from this position by I-spreading:

(8) /idrac-*øn-da-ysa-lar/ [idracindeyseler]* ‘if they are aware of it’

Unlike the disharmonic suffixes given in the precious section, in this example, we do not see blocking of spreading. On the contrary, there is an

unexpected element I within the suffixation process. Besides these two palatal consonants, there are also cases of palatalisation. For palatal consonants, there is nothing predictable about their distribution in a word because their presence is lexical as seen in the minimal pairs in (5). There are words which lexically contain a root-final palatal consonant. On the other hand, there are also palatalised consonants which are in a complementary distribution with their unpalatalised counterparts. See the suffixed forms of the roots *akab* "end", *harf* "letter of the alphabet", *sıhhat* "health" and *vaad* "commitment":

(9)	*akab-in-de, *akabında*	'at the end of'
	*harf-in-de, *harfında*	'at the letter of'
	*sıhhat-in-de, *sıhhatında*	'at the health of'
	*vaad-in-de, *vaadında*	'at the commitment of'

As can be seen, the final consonants of the roots ending with *r*, *d(d)*, *b* and *t* are getting palatalised when a suffix is added. Hence, I-spreading is realised by the head of the harmonic domain which shares I with the root-final consonant. Note that, most of the palatalisation cases in Turkish include the consonant *t*. The palatalised *r*, *d(d)* and *b(b)* are very restricted: there are only eight roots - all of which are from Arabic except *yar* "lover" which is a loanword from Persian - and several of them are obsolete words. See the list:

(10)	*yar*	→ *yari, *yarı*	'lover'
	had	→ *haddi, *haddı*	'limitation'
	kad	→ *kaddi, *kaddı*	'stature'
	serhad	→ *serhaddi, *serhaddı*	'frontier'
	vaad	→ *vaadi, *vaadı*	'commitment'
	akab	→ *akabi, *akabı*	'behind'
	rab	→ *rab, *rabbı*	'god'

In the left column, one can see the bare forms of the root. When the accusative suffix is added, as can be seen in the right-hand column, unexpectedly, only the disharmonic forms are grammatical in Turkish. Clearly, palatalisation makes the words disharmonic. Since these examples are rare and obsolete, it is not easy to talk about their properties within a phonological framework. Therefore, they are beyond the scope of this study[36]. Those ending in a palatalised *t*, on the other hand, are common enough and are still in use. The next chapter provides a new observation on whether t-palatalisation is lexical and unpredictable or whether it is subject to a phonological structure and is predictable. It shows that the former assertion, which is generally accepted in the literature on this subject, is a fallacy caused by lack of data. A GP analysis of the data is also presented.

[36] Note that, there are also two Arabic loanwords ending in a consonant cluster and disharmonic which are *harf* "letter" and *harp* "war".

4.4. T-palatalisation

The purpose of this section is to be both descriptive and theoretical. Firstly, I aim to exhibit all the relevant data and to present new observations and secondly, to determine whether or not GP can provide a consistent account for the phonological phenomenon at issue. As shown in the previous section, there are some roots ending with certain consonants and whenever a suffix is attached to those roots, the element I can appear in the nuclear position(s) of the suffix even if there is no I in the rightmost nuclear position of the root. Not counting the limited exceptions given in 2.3.2.2, these roots end in one of the three consonants /l/, /c/ and [t^j] all of which are available only in loanwords. See the following:

(11)	*/emlac-a/*	*[emla:c-e]*	'to the estate'
	/gol-a/	*[gol-e]*	'to the goal (in football)'
	/takat-a/	*[ta:kat^j-e]*	'to the endurance'

In these cases, the source of I is thought to be the previous segments /l/, /c/ and [t^j] because there is no I element in the preceding nuclear positions. The palatal consonants /c/ and /l/ can also surface in the non-initial positions of a word and they are highly common in Turkish. The cases with a palatalised *t*, on the other hand, are restricted to the root-final positions. Furthermore, palatalisation is realised only if a suffix is added to the root. See the distribution of these three occurrences in a possible Turkish word (V stands for vowel, C stands for consonant, and the full stop stands for the phonetically silent empty nucleus while # is used to show word

boundaries):

(12)	position	/l/	/c/	[tʲ]
	root-initial	: #lV	#cV	*#tʲV
	post-coda	: VC.lV	VC.cV	*VC.tʲV
	inter-vocalic	: VlV	VcV	*VtʲV
	internal-coda	: Vl.CV	*Vc.CV	*Vtʲ.CV
	root-final	: Vl#	?Vc#	?Vtʲ#

As the table reveals, /l/ can surface in any position in Turkish. The segments /c/ and [tʲ], however, have a restricted environment in that /c/ cannot surface in root-final and internal-coda positions whereas [tʲ] can never surface in any position of an unsuffixed root. In these cases, /c/ and [tʲ] are replaced by /k/ and [t], respectively. Unlike /l/ and /c/, the presence of [tʲ] does not constitute minimal pairs. It is in complementary distribution with [t]. Importantly, in addition to this, /l/ and /c/ are mostly preserved in loanwords. That is to say, if they are available in the original form of the loanwords, then they are very rarely altered into their velar counterparts /l/ and /k/ which do not cause vowel disharmony. However, when [tʲ] is included in the problem, things get complicated. All words ending in [tʲ] have been borrowed from Arabic but, among innumerable words of Arabic origin ending in [tʲ], only forty-five are uttered with [tʲ]. All the others change into [t]. As shown, firstly, it can only occur root-finally and, secondly, it needs a following vowel to be activated. Even so, few roots ending in [tʲ] in the source language can save their palatality in Turkish.

Like the distribution of /l/ and /c/, t-palatalisation is also regarded as a lexical phenomenon in the literature (Lees 1961: 53). In this section, I argue against this current view and claim that it is not the lexicon but the phonological environment that determines the availability of t-palatalisation in Turkish. The distribution of t-palatalisation is presented below and it shows that its environment is absolutely predictable under certain conditions. In the following sections, the data is discussed within the GP framework.

4.5. The Conditions

As already mentioned, palatalisation is thought to be the source of I in certain disharmonic cases like *[sürat^{j}-e]* "to the speed". Palatalised segment [t^{j}] can share its I element with its following nucleus. In the literature, the distribution of palatalised *t* is assumed to be lexical and unpredictable (Lees 1961: 53). Among grammarians, the only observation about the regularity of its distribution is made by Lees (1961). According to him, palatalisation in Turkish is subject to the existence of the two different segments in Arabic. The emphatic *t* which is written with the letter ط and the non-emphatic *t* which is written with the letter ت. In Turkish, there is no difference between these two segments, i.e. they are pronounced the same. Lees (1961) observes that although the emphatic *t* is not available in Turkish, it does not lose all of its properties so it can never be palatalised whereas the non-emphatic *t* is palatalised. See the following:

(13)	*/fakat-a/*	*[fakat-a]*	'to the but'
	/sakat-a/	*[sakat-a]*	'to the injured'
	/sukut-a/	*[sukut-a]*	'to the degradation'
	/tabut-a/	*[tabut-a]*	'to the coffin'
	/tavassut-a/	*[tavassut-a]*	'to the mediation'

All roots in (13) originally end in emphatic *t* and they are never changed into a palatalised segment [t^j]. His observation is actually true up to a point but it certainly needs amendment because it cannot explain the de-palatalisation of root-final non-emphatic *t*. See the following:

(14)	*/ruhsat^j-a/*	*[ruhsat-a]*	'to the licence'

Although the root *ruhsat* "licence" does not end in emphatic *t*, there is no disharmony. Lees (1961) says nothing about such cases which are very common in Turkish[37]. However, I believe that these cases are also perfectly predictable.

Also, according to my observation, there is no need to know whether the segment at stake is originally an emphatic *t* or a non-emphatic *t*. The phonological structure of the roots can explain all the data including the ones in (13). Here is my observation:

[37] It should be noted that r*uhsat* "licence" has an emphatic consonant before *a* represented by ص in the Arabic alphabet. Therefore, there is a flanking emphatic consonant although it is not word-final. However, there are many other examples such as *fıtrat* "disposition", *fırsat* "opportunity", *sanat* "art" which have no surrounding emphatic consonant.

(15) If: (a) a root-final /t/ is preceded by a short *a* and

(b) this short a is preceded by

(i) a vowel including I (a front vowel) or,

(ii) a geminate or,

(iii) a long vowel,

then it can easily be predicted that the root-final /t/ can share I and can surface as [tʲ] unless it is not followed by a parametrically p-licensed empty nucleus.

The following exemplifies (i), (ii), (iii), respectively:

(16)	*sürat*	'speed'
	sıhhat	'health'
	ta:kat	'endurance'

All of the examples above include a short *a* before */t/*. The first example *sürat* "speed" includes *ü* (U.I) followed by *a*. The segment *ü* (U.I) contains the element I. The second example *sıhhat* "health" includes a geminate just before *a* and the last one *ta:kat* "endurance" includes a long vowel in the position in question i.e. it occurs before short *a* . Predictably, all of the root-final segments are palatalised whenever a suffix is added:

(17)	*[sürat^{j}-i], *[sürat^{j}-ı]*	'the speed (Acc.)'
	*[sıhhat^{j}-e], *[sıhhat^{j}-a]*	'to the health'
	*[ta:kat^{j}-in], *[ta:kat^{j}-ın]*	'of the endurance'

The accusative, dative and genitive suffixes do not include a lexical I element. Since there is no nuclear source for I-spreading, the forms **sürat^{j}-ı, *sıhhat^{j}-a* and **ta:kat^{j}-ın* are the expected forms. Nevertheless, these forms do not exist. Apparently, the palatalised segment [t^{j}] has to be followed by a vowel including I. In other words, it has to share I with the following vowel. We can now look at some roots ending in [t^{j}] in Arabic that do not cause vowel disharmony in Turkish:

(18)	*/bera:t^{j}-a/*	*[bera:t-a]*	'to the title of privilege'
	/edebiya:t^{j}-a/	*[edebiya:t-a]*	'to the literature'
	/maluma:t^{j}-a/	*[ma:lu:ma:t-a]*	'to the information'
	/mükafa:t^{j}-a/	*[müka:fa:t-a]*	'to the reward'
	/mülaka:t^{j}-a/	*[müla:ka:t-a]*	'to the interview'
	/neşa:t^{j}-a/	*[neşa:t-a]*	'to the elation'
	/tahkika:t^{j}-a/	*[tahki:ka:t-a]*	'to the inquiry'

All of the words in the above example have long *a:* originally and all, except *berat*, are plurals. Since all of the examples in (18) contain a long vowel, the underlying [t^{j}] sound cannot surface regardless of whether or not the other three conditions in (15b) above exist. Below are listed examples of Arabic loanwords which end with a short *a* and [t^{j}] but which do not satisfy even one of the conditions given in (15) above:

(19)	*/fırsat^{j}-a/*	*[fırsat-a]*	'to the opportunity'
	/fıtrat^{j}-a/	*[fıtrat-a]*	'to the disposition'
	/maslahat^{j}-a/	*[maslahat-a]*	'to the affair'
	/rahat^{j}-a/	*[rahat-a]*	'to the comfortable'
	/ruhsat^{j}-a/	*[ruhsat-a]*	'to the licence'
	/saltanat^{j}-a/	*[saltanat-a]*	'to the reign'
	/sanat^{j}-a/	*[sanat-a]*	'to the art'
	/sıfat^{j}-a/	*[sıfat-a]*	'to the adjective'
	/vuslat^{j}-a/	*[vuslat-a]*	'to the reunion'

This time, the segment [t^{j}] in the loanwords is preceded by a short *a*. The first condition for palatalisation is that there must only be short *a* before [t^{j}] is met. The reason for de-palatalisation is that the short *a* is not preceded by a vowel including I, a geminate or a long vowel. What I have shown in this section is an observation. In the next section, I offer an analysis of the given data from a GP point of view.

4.6. Depalatalisation as Element Suppression

As discussed in 1.2.2, different positions have different a-licensing potentials. A phonological expression can or cannot occur in a certain position according to the a-licensing potential of the position at issue. If the position is not strong enough, then the segment loses some of its elements, this can be seen in glottalling and tapping in English (Harris and Kaye 1990: 258-264). In GP, lenition and fortition are defined

simply as element suppression and element addition respectively. Segments lose or gain some element and change into a different segment.

For a segmental change to occur, there seems to be two possibilities in terms of element theory: either (i) the segment loses some of its elements or (ii) it gains some additional element. The former is called decomposition and the second is composition. The following examples include the process of word-final devoicing which is highly common in Turkish:

(20)	*/kanad/*	*[kanat]*	'wing'
	/kanad-a/	*[kanada]*	'to the wing'

Word-final positions are reported to be weak positions in various languages. They are either in favour of or fail to resist element addition and suppression (Harris 2009: 20). In (20), it can be seen that *d* cannot surface in a word-final position. For the word-final devoicing case above, following Brockhaus (1991) and Harris (1997, 2009), I claim that it is a process of element suppression. That is, *d* loses some of its elements within a decomposition process. It is actually the element L which *d* loses:

(21) /d/ $\xrightarrow{\text{loss of L}}$ /t/ (adapted from Harris 1997: 345)

As was stated in 1.1, L stands for voice. The voiced segment *d* loses L and changes into its voiceless counterpart *t*. In this study, I claim that word-final de-palatalisation is also a case of element suppression. As stated in Clements and Sezer

(1982), /c/ cannot surface in root-final position unless there is a following vowel as in *[idrak]* "comprehension" but *[idrac-e]* "to the comprehension" (i.e. /c/ surfaces in root-final position when there is a following vowel) (Clements and Sezer 1982: 239). The same phenomenon is also valid for the roots with [tʲ]:

(22)	*/süratʲ/*	*[sürat]*	'speed'
	/süratʲ-e/	*[süratʲe]*	'to the speed'

In GP, it is accepted that the palatalised consonants contain the element I. Just like /d/ which has an additional L element, [tʲ] is also a more complex segment than /t/ as it contains an additional I. As seen, the phonetic realisation of the following nuclear position permits both the nuclear and the onset positions to have the element I but in a word-final position [tʲ] cannot keep its I element.

(23) [tʲ] $\xrightarrow[\text{loss of I}]{}$ [t]

In (23), the word-final segment again loses one of its elements and this time, it is I. Stated differently, the process of de-palatalisation involves the loss of the I element in a word-final position. This melodic decomposition is caused by the diminished a-licensing potential of the position. Put simply, a word-final onset position cannot a-license the I element for the segment *t*. Therefore, it is not shared by the nucleus position either and no disharmony occurs. I am assuming here that this I element is floating and appears only in certain circumstances. The ensuing

section investigates the concept of sharing and the existence of the floating I.

4.7. The Sharing Condition and the Floating I

Within the GP framework, vowel disharmony after palatalised consonants can be assumed to be an outcome of the element sharing process. Gussmann and Kaye (1993) claim that the relation between palatalised consonants and the flanking vowels is non-directional. Both participants equally share the element at hand. In other words, elements do not spread from one position to the other but rather they are shared by the onset and nuclear positions. This is stated in the Sharing Condition:

(24) Sharing Condition

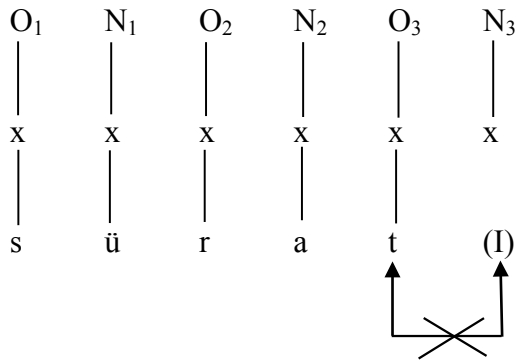
Nuclei share the element I or U with their onsets (Cyran 1995: 47).

The hypothesis here is that the element does not occupy a position and does not spread into another position. Thus, in support of my argument, it can be said that the element I is shared by the palatalised consonant and its following vowel. However, as shown in the previous section, this is not always the case and, in fact, it can just phonetically disappear.

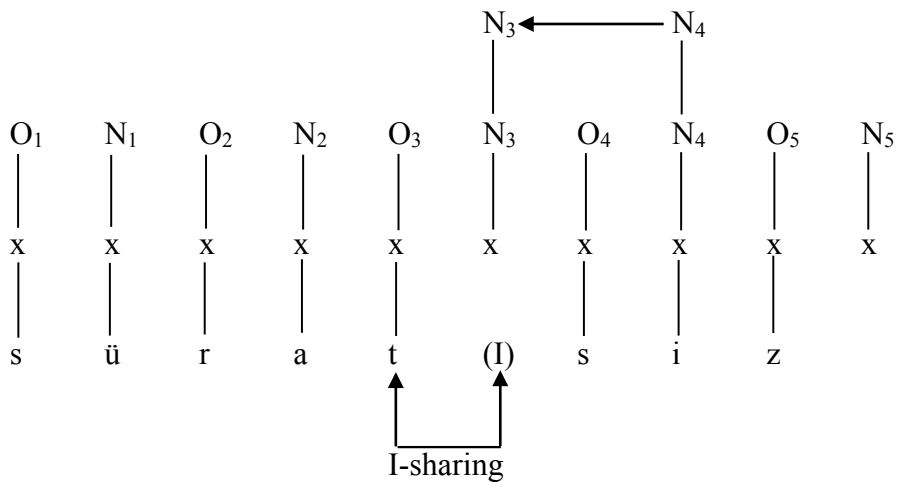
I claim that there is a floating I, which is phonetically null and preceded by *t*. The already established fact that a phonetically empty nucleus can be the head of the harmonic domain in Turkish supports my claim: even if a consonant-initial suffix is added to a word, I-sharing is not blocked as can be seen in *[sürat^{j}-siz]* “slow”. It is

clear that although there is no phonetically interpreted licensor for [tʲ], it can share its I element with a phonetically null nucleus and this pseudo empty position, (as the head of the harmonic domain), spreads I into the following vowel(s). See (25):

(25) (a) *[sürat]* ‘speed’



(b) *[süratʲsiz]* ‘slow’



The difference between (25a) and (25b) stems from the fact that in the former, N_3 is parametrically p-licensed whereas in the latter, it is properly governed by N_4. As mentioned in Chapter 1, Licensing Inheritance states that a position can a-

license more melodic material if it is directly p-licensed by the ultimate head. It is well documented that parametrically p-licensed domain-final empty nuclei exhibit peculiar features in many languages (Charette 1991: 134-139). Here, it seems that it is in a weaker position than a properly governed position. In (25a), O_3 is licensed by the parametrically p-licensed domain-final empty nucleus N_3 and it cannot a-license the element I, while in (25b), the p-licensing potential of the properly governed empty nucleus N_3 is enough to provide O_3 with a-licensing power to host its I.

In sum, [t^j] can surface in root-final positions followed by a nucleus position which is not parametrically p-licensed but is suppressed elsewhere. On the other hand, its presence in the root-final position is directly related to the phonological structure of the root, which contains two feet. I-sharing can be realised only with the help of licensing from the foot outside. The next section reveals this assertion.

4.8. The Licence to Share and the Phonological Feet

The element I is needed when its nuclear position is licensed from the preceding foot. For licensing to be realised, by using the concept of four-position template from 1.4, I assert that certain conditions on the nuclei of final and penultimate feet have to be met. If there is no foot which meets these conditions, since there is no licensing relationship and the floating I does not need to be shared by *t*, then it remains phonetically null. Below, I first examine the three types of roots where the penultimate feet include a long vowel or a geminate. Then I discuss those cases when the element I outside the final foot can trigger I-sharing.

4.8.1. Penultimate Foot Including a Long Vowel or a Geminate

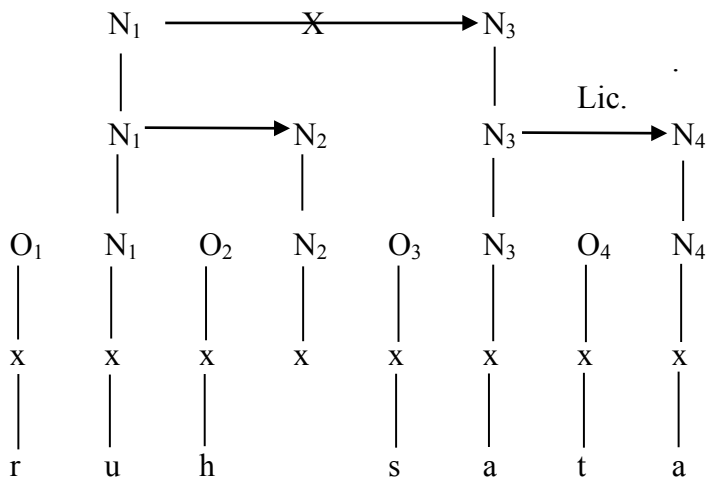
A Foot is a phonological unit which contains a nuclear head and a nuclear dependent. The word *kara* “land”, for example, includes one foot with two nuclear positions, whereas in a word like *karasal* “terrestrial”, there are two feet with four nuclear positions including the domain-final empty one. I propose that in order for the floating I to be active phonologically, the position hosting the element I has to be licensed from the foot outside. However, for this licensing relation to be realised, certain conditions must be met. See (26):

(26) (i) The head of the final foot must contain only the element A.

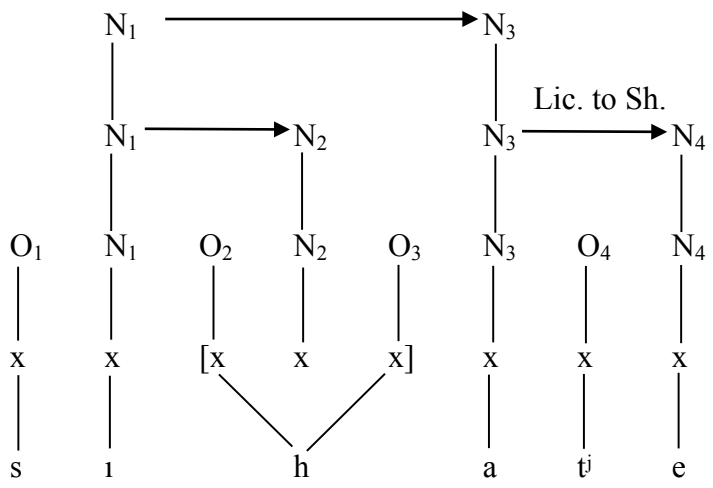
(ii) The penultimate foot must constitute a closed domain.

The former condition necessitates a short vowel before *t*. The latter excludes all possible roots that do not include a long vowel or a geminate in their penultimate foot. See (27) below:

(27) (a) *[ruhsat-a]* ‘to the licence’

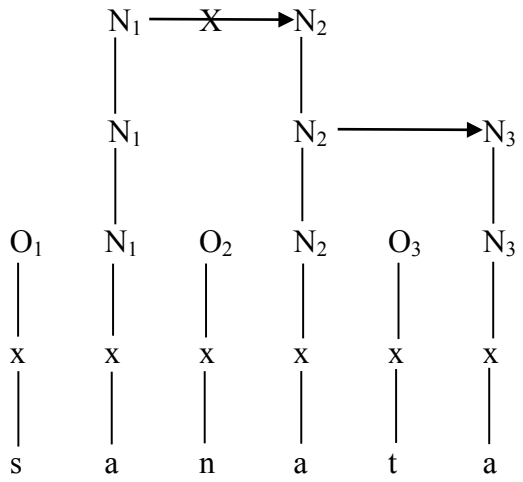


(b) *[sɪhhat^{j}-e]* ‘to the health’

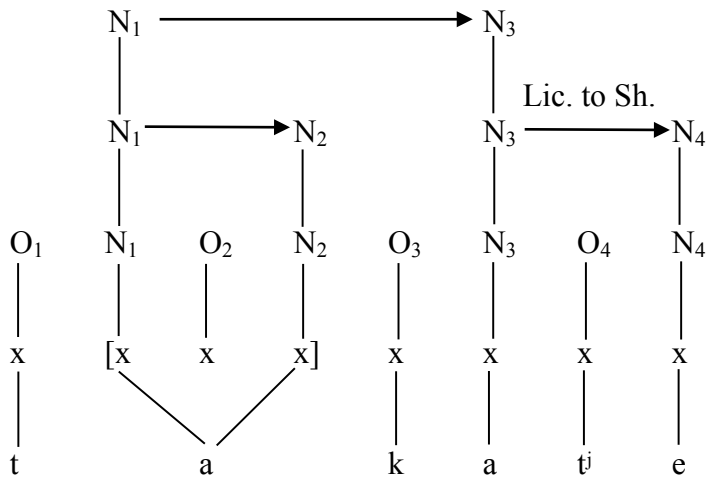


Lowenstamm (1999) introduces the concept of the closed domain with examples from various languages. According to him, a buried nucleus position in a closed domain is not able to license any positions (Lowenstamm 1999: 158). I claim that (i) licensing to share can only be possible if there is a buried dependent in the penultimate foot and (ii) only geminates and long vowels can constitute a closed domain in Turkish. In (27a) above, since the dependent position of the penultimate foot N_2 is not buried in a closed domain, the head of the final foot N_3 cannot be licensed by the head of the penultimate foot N_1. Therefore, N_3 cannot license to share N_4. In (27b), however, the buried position N_2 renders the licensing relation between the heads of two feet possible. Thus, N_3 can license to share N_4. Now, see the following:

(28) (a) *[sanat-a]* ‘to the art’



(b) *[ta:kat^{j}-e]* ‘to the endurance’



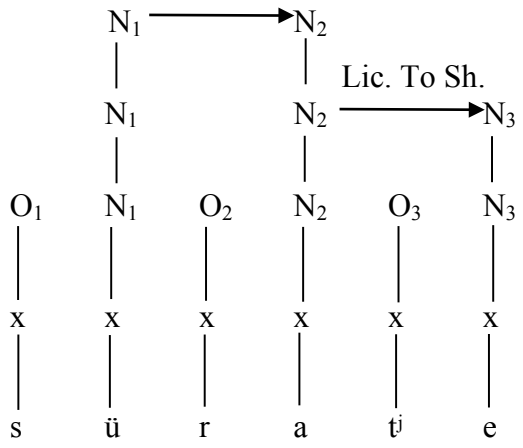
This time, in (28b), there are two nuclear positions which constitute a foot and the head of this foot can license N_4. In (28a), however, there is no closed domain. In fact, there is not even a penultimate foot. The second projection of N_1 cannot license N_2 and N_2 cannot license to share N_3. Therefore, there is no I-sharing. The behaviour of these two types of roots is explained. The case of the third type, on the other hand,

is more complicated.

4.8.2. The Element I outside the Final Foot

As stated before, there are also roots which do not contain a geminate or a long vowel but a vowel including I in the antepenultimate nuclear position. Within these roots, t-palatalisation is possible. See the following:

(29) *[sürat^{j}-e]* 'to the speed'



The representation in (29) is out of the ordinary. It is clear that the element I in N_1 has some kind of triggering function on the palatalisation process. However, it is totally unexpected from a GP point of view. Unlike the samples that have been discussed in the previous subsection, the phenomenon in question is not related to the phonological structure: there is no need for a penultimate foot and, more importantly, the melodic content of the position, that is the presence of I, can affect

the process. It is clear that there is an intervening position N_2; it is not a spreading process. As I cannot immediately see a satisfactory explanation to account for this, then these words, which total nine in Turkish, remain a problem for my analysis.

In this chapter, I have given an integrated account of t-palatalisation in Turkish. Some problems remain about the roots including I in the antepenultimate nucleus position. Also, the reason why there is a need for the vowel *a* before *t* has not been discussed in this study. Lastly, in my analysis of closed domains within the penultimate foot, a significant problem about the end of Turkish words has not been discussed. While the facts that I have analysed in this chapter show that all final vowels including the high vowels *i*, *ı*, *u* and *ü* are syllabified in a word-final nucleus, other facts of the language have led the GP analysts to propose that, in Turkish, word-final nuclei - at least the ones that do not include the lexical element A - are never phonetically expressed. This is a crucial issue that I will consider next.

As pointed out at the start of the chapter, this study has been an attempt at presenting a descriptive and theoretical contribution to the study of the phonology of Arabic loanwords in Turkish linguistics by focusing on a single phenomenon, t-palatalisation. Since [t^j] can never surface in a word-final position, it can be said that observing root-external vowel disharmony is the only way to see whether there is a t-palatalisation process or not. I have presented a new observation about the distribution of palatalised *t* and proposed that t-palatalisation can be easily predicted simply by looking at the phonological environment of the roots. I have also analysed the data within GP. It can be stated that the problems which have emerged from the data are surprising for the theory.

CONCLUSION

This thesis has examined the phonology of Arabic loanwords, borrowed by Turkish over generations, within the framework of (Standard) Government Phonology (GP) and through the specific analysis of t-palatalisation in Turkish.

I have examined the phonological environment needed for t-palatalisation in Arabic loanwords. The constraints required to explain this phenomenon, which are elemental content of sounds and syllable structure have been discussed in detail. In accordance with the GP framework, it has been argued that there must always be a causal relationship between the phonological context and the phonological process that takes place within it. Counter to previous analysis that claimed t-palatalisation was lexical (Lees 1961 and so on), this work presented here has clearly shown that t-palatalisation is not lexical but structurally determined by certain conditions with the help of the restrictions imposed by GP.

The primary aim of this study was to investigate Arabic loanwords through their phonological properties. In Chapter 1, the foundation on which this thesis was built was laid out. All the relevant tenets of GP were discussed and a detailed theoretical background given in order to serve as a foundation for the following chapters. The basis for this study was explained. This included the elements, their possible combinations, constraints on them, auto-segmental and prosodic licensing

and types of government. Chapter 2 examined the history and phonology of Turkish including the behaviour of its vowels and consonants. A background to the Turkish language was given. Its related phonological properties were explained. Its vocalic inventory of eight vowels and vowel harmony were discussed in detail. In Chapter 3, the loanword adaptation processes, influences on adaptation and sociolinguistic differences were examined. The behaviour of the loanwords and their methods of adaptation were explained and analysed.

Finally, Chapter 4, the core chapter of this thesis, discussed in detail the occurrence of t-palatalisation in Turkish. The unaddressed aspect of t-palatalisation was brought to light. In contrast to what has been assumed in the literature, it was shown that the t-palatalisation observed in Arabic loanwords is a predictable process in Turkish. I have argued against the current view and claimed that it is not the lexicon but the phonological environment that determines the availability of t-palatalisation in Turkish.

In this thesis I have discussed topics either directly or indirectly related to loanword adaptation in Turkish. However, there are, of course, issues that this work has ignored and four of these are briefly mentioned below as they could provide the basis for further studies.

Firstly, it should be noted that this study cannot explain why the vowel preceding the palatal [tʲ] is always /a/. T-palatalisation only happens when the sequence -*at* is the feminine singular suffix in Arabic. For GP, it may not be implementable since it concerns the semantics of a certain suffix and not something about its structure. Honeybone (1999) admits that some aspects of languages are "messy" and might not be open to a neat analysis (Honeybone 1999: 190). For the

restrictive nature of the GP framework, this is not a desirable result. Indeed, not all words with an Arabic feminine singular suffix are disharmonic as is shown in Chapter 4.

Secondly, while explaining the vowel disharmony process, it has been argued that it cannot be a case of I-spreading from the first vowel in a word like *süratsiz* "slow", because of the intervening back vowel. Instead, the idea is that the spreading of a feature would show up in all the vowels in the spreading domain. The possibility that the /a/ in -*at* is a transparent vowel could be considered. A transparent vowel is one whose realisation does not change but through which vowel harmony can proceed uninterrupted. For example, in Mongolian the vowel /i/ is always a front vowel, but, if the first vowel in a word is back and the second vowel is (?) /i/, all subsequent vowels will be back, even though /i/ is front. Mongolian /i/ is therefore called a transparent vowel. In this thesis, I have not mentioned the issue of transparent vowels in Altaic languages, even though they may provide a basis for disharmonic cases with t-palatalisation. This is because to do so would involve the use of historical linguistics and would probably also need a different framework, one built around an interest in transparent vowels.

The third issue, which has not been addressed in this study, involves the phonetic aspects of t-palatalisation. The claim that the *t* sound in these loanwords is palatal is open to discussion. This study notes that it does not have the same distribution as the other palatal consonants, */l/* and */c/*, and it can only appear at the end of a word. In other words, it becomes depalatalised in word-initial and word-internal positions, and can only appear in the root-final position. The problem with this is that this is precisely the position where it is claimed that the segment becomes

depalatalised. This criticism is based on phonetics. I have not tried to detect the palatal pronunciation of t anywhere in Turkish. Since GP states that phonology is entirely distinct from phonetics and that phonological phenomena are independent of pronunciation (Ploch 1999), I have not looked at this issue at all.

Lastly, this study has not covered at the Persian forms of Arabic loanwords. It is important to note that, along with the introduction of Islam during this period, many words were borrowed from the neighbouring languages spoken by Muslims, namely Persian and Arabic. Crucially, most of these words, whether Iranian or Semitic in origin, were borrowed via Persian (Perry 2001). However, the core issue of the thesis is t-palatalisation and there is no t-palatalisation in Persian (Bhat 1978: 77). It is quite clear, therefore, that not looking at the Persian data is not a remarkable difficulty for this study.

There might possibly be questions on this topic other than those raised in this thesis. Both these and any other issues that might be related to loanword adaptation and t-palatalisation, remain open for further research because they exceed the scope of this study. It is hoped, therefore, that this thesis will provide a starting point for further studies.

APPENDIX: PALATALISED SEGMENT [T^j]

Words That Include the Palatalised Segment [t^j]

Table 1: The Roots Containing a Penultimate Long Vowel

Nominative	Accusative	
1. *bela:gat*	*bela:gat^j-i*	'elocution'
2. *bela:hat*	*bela:hat^j-i*	'imbecility'
3. *bera:at*	*bera:at^j-i*	'dismissal'
4. *bi:at*	*bi:at^j-i*	'obeisance'
5. *cema:at*	*cema:at^j-i*	'community'
6. *cera:hat*	*cera:hat^j-i*	'suppuration'
7. *fera:gat*	*fera:gat^j-i*	'demise'
8. *haki:kat*	*haki:kat^j-i*	'reality'
9. *hama:kat*	*hama:kat^j-i*	'stupidity'
10. *istira:hat*	*istira:hat^j-i*	'rest'
11. *ita:at*	*ita:at^j-i*	'obedience'
12. *kaba:hat*	*kaba:hat^j-i*	'fault'
13. *kana:at*	*kana:at^j-i*	'conviction'

14. *kera:hat*	*kera:hat^{j}-i*	‘aversion’
15. *kıra:at*	*kıra:at^{j}-i*	‘reading’
16. *liya:kat*	*liya:kat^{j}-i*	‘qualification’
17. *menfa:at*	*menfa:at^{j}-i*	‘benefit’
18. *nasi:hat*	*nasi:hat^{j}-i*	‘advice’
19. *refa:kat*	*refa:kat^{j}-i*	‘escort’
20. *sa:at*	*sa:at^{j}-i*	‘hour’
21. *sada:kat*	*sada:kat^{j}-i*	‘loyalty’
22. *sara:hat*	*sara:hat^{j}-i*	‘unambiguousness’
23. *sefa:hat*	*sefa:hat^{j}-i*	‘profligacy’
24. *seya:hat*	*seya:hat^{j}-i*	‘travel’
25. *şeca:at*	*şeca:at^{j}-i*	‘bravery’
26. *şeri:at*	*şeri:at^{j}-i*	‘religious law’
27. *tabi:at*	*tabi:at^{j}-i*	‘nature’
28. *ta:kat*	*ta:kat^{j}-i*	‘endurance’
29. *tari:kat*	*tari:kat^{j}-i*	‘religious order’
30. *zana:at*	*zana:at^{j}-i*	‘craft’
31. *zira:at*	*zira:at^{j}-i*	‘cultivation’

Table 2: The Roots Containing a Penultimate Geminate Cluster

Nominative	Accusative	
1. *dikkat*	*dikkat^{j}-i*	'attention'
2. *meşakkat*	*meşakkat^{j}-i*	'fatigue'
3. *muvakkat*	*muvakkat^{j}-i*	'temporary'
4. *rikkat*	*rikkat^{j}-i*	'delicacy'
5. *sıhhat*	*sıhhat^{j}-i*	'health'

Table 3: The Roots Containing a Penultimate Front Vowel

Nominative	Accusative	
1. *firkat*	*firkat^{j}-i*	'separation'
2. *hilat*	*hilat^{j}-i*	'robe of honour'
3. *hilkat*	*hilkat^{j}-i*	'creation'
4. *lügat*	*lügat^{j}-i*	'dictionary'
5. *rekat*	*rekat^{j}-i*	'movement in praying'
6. *ricat*	*ricat^{j}-i*	'retreat'
7. *sirkat*	*sirkat^{j}-i*	'theft'
8. *sürat*	*sürat^{j}-i*	'speed'
9. *şefkat*	*şefkat^{j}-i*	'affection'

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