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Lenition in Persian Phonological System

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Abstract

This study deals with lenition processes according to the theoretical framework of generative phonology to answer the cited questions: How phonological processes are applied in Persian phonological system as lenition? In other words, how do the data support the application of lenition processes in Persian? In which contexts do lenition processes apply in Persian? Synthetic process typology of phonological processes is investigated according to the phonological pattern of Persian; finally the most frequent lenition processes are selected. To see how these processes are applied in Persian as lenition, Standard Persian and six dialects out of twenty five dialects which show these processes are selected. The data are gathered in field study. Then, each of the lenition processes is probed on the Persian varieties to find the alternatives and underlying forms which are important to decide how the lenition processes are applied; and to find the positions in which lenition processes take place. The collected data support the lenition processes in Persian. The data show that the lenition processes tend to occur in postvocalic, intervocalic and final positions; and the final position has the highest frequency for lenition processes to occur. This support Kenstowichz's idea that mentions word final is the typical position for lenition.

Keywords: lenition processes, generative phonology, synthetic process typology, Persian phonological system

1.Introduction

1.1The Current Approaches to Lenition

In traditional approach, the typology of phonological processes is dualistic. There exist two types of phonological processes: lenitions and fortitions which are differentiated on the basis of the strength of sound, or energy expended in its production. Voiced sounds are called lenis (weak), whereas voiceless ones are called fortis (strong). The fortis/lenis distinction derives from the greater/lesser pressure of air built up under the vocal folds which, in turn, results in the greater/lesser force of articulation. Bussmann (1996) discusses the properties of the lenition processes and stresses the distinction between the consonantal and vocalic lenition: "Phonetically motivated process of sound change that leads to the reduction of sounds and, in extreme cases, to loss of segments; typically this occurs in positions where assimilation is favored or in syllabically 'weak' positions (e.g. in final position, in unstressed syllables). Two types of weakening are distinguished. (a) Consonant weakening (also lenisization): this denotes a weakening of consonant strength (through a reduction in air pressure and muscle tension or an increase in sonority) to the complete loss of a segment […] (b) vowel weakening: this is a term for all processes that lead to a weakening of the articulatory movement in the sense of an increasing centralization of vowels and finally a total loss of the vowel" (Bussmann 1996: 519). Trask (1996) also defines lenition as "Any phonological process in which a segment becomes either less strongly occluded or more sonorous. Often the term is extended to various other processes, such as loss of aspiration, shortening of long segments and monophthongization of diphthongs, which represent 'weakening' in some intuitive sense" (Trask 1996: 201).

In the literature of "Natural Phonology", phonological processes are divided into lenition and fortition on the basis of the functions they serve and the context in which they appear (Luschützky 2001). Both lenition and fortition operate on a segmental level, as opposed to prosodic processes which are located at a suprasegmental level (Luschützky 2001). Moreover, their labels refer to various aspects of language: centrifugal/centripetal refers to the phonetic space, strengthening or weakening refers to phonetic gestures whereas foregrounding or backgrounding address communicative teleology (Luschützky 2001). Within the NP framework, the lenition/fortition definition is based on the needs of the speaker as well as the listener and offers an operational procedure: if the phonological material is deleted for the benefit of the speaker, it is a lenition; when the material is added for the sake of the listener, it is a fortition.

The OT approach (Boersma 1998, Kirchner 1998) advocates articulatory effort as the motivation of lenition and fortition. For instance, lenition is effort-based and driven by a natural need to minimize articulatory effort (Kirchner 1998). Articulatory effort is employed by Boersma in the sense of biomechanical parameters such as precision, distance, coordination, energy, mass etc. There is no denying that these parameters can be measured. Moreover, a holistic approach could be implemented, under which the parameters can be simply added. It would also be interesting to establish the role of individual parameters in the overall effort. The role could be resolved by in the OT literature (Boersma 1998) but failed to become a standardized measure. Thus, the idea of biomechanical parameters

as such is not subject to critique, unlike the lack of the idea's implementation. Besides, biomechanical parameters as the solely lenition criteria do not take into consideration the mental reality of processes. Lenition broadly understood operates in the direction from a more to less difficult sounds.

1.1. The Evaluation of the Current Approaches

The evaluation of the current approach to lenition/fortition leads to the following observations. First, there is no exhaustive definition of lenition/fortition whereas the existing ones are either circular in the traditional approach (e.g. Trask 1996, Bussmann 1996) or automatic in the current approaches to lenition/fortition, i.e. they are based on the erroneous assumption that phonological processes are automatic, a mere substitution of weak sounds for the strong ones or an indiscriminate deletion/addition of sounds. If it were true, all languages of the world would be the same and this is simply not the case. Second, in the absence of a satisfactory definition of lenition or fortition it is still not clear what classifies a given process as lenition or fortition. Third, the current approaches classify processes as lenition/fortition on the basis how a process operates, not on what it does (procedure is considered, but its result is not taken into account at all). Evaluating the current debate on phonological processes, it appears that although lenition and fortition have an extensive literature, a number of controversial issues can still be identified. So to define the lenition process more accurately in Persian dialects, we concentrate on a combination of the abovementioned approaches.

Unfortunately, no exhaustive compilation of processes exists in the linguistic literature, presumably due to the fact that each theory investigates only selected aspects of processes and selected examples are provided. So, it is better to have a synthetic look at traditional, NP and OT approaches. The following table presents the processes discussed by various authors. It reflects the current approaches (the name, relevant source).

Table1. Synthetic Process Typology of lenition processes

Lenition
Monophthongzation (Dressler 1985a: NP)
Shortening (Dressler 1985a: NP, Kirchner 1998: OT, Mateescu 2003)
Weakening: fricativization, gliding (Dressler 1985a: NP, Kirchner 1998: OT)
Centralization (Dressler 1985a: NP)
Segment Deletion (Dressler 1985a: NP, Dziubalska-Kołaczyk 2003: NP,Kirchner 1998: OT)
Cluster reduction/Simplification (Dziubalska-Kołaczyk 2003: NP)
Assimilation of stops and nasals (Dressler 1985a: NP, Dziubalska-Kołaczyk 2003: NP, Jun 2004 :OT)
Palatalization: Yod coalescence (Dziubalska-Kołaczyk 2003: NP)
Degemination (Dziubalska-Kołaczyk 2003: MNP, Kirchner 1998: OT)
Hiatus avoidance via linking or intrusive /r/ (Dziubalska-Kołaczyk 2003: NP)
Smoothing (Dziubalska-Kołaczyk 2003: NP)
Flapping (Kirchner 1998: OT)
Debuccalization (Kirchner 1998: OT)
Voicing (Kirchner 1998: OT)

2.Cross Linguistic Review

We can prospect to find lenition processes in other languages. By studying a number of languages, kenstowicz concludes "the most typical environment for lenition in cross linguistics is word final and intervocalic positions, while word initial is the typical position for fortition" (kenstowicz, 1994: 35). There are some descriptions of processes in lenition in the following tables based on the selected languages:

Table2. Samples of Lenition processes in word final position

Language	Reference	Description of processes	Type of Process
Finnish	Sulkala& Karjalainen (1992)	k, h → ø / _ #	Deletion
Totonac	MacKay (1984)	q → χ / _#	Fricativization
Basque	Hualde (1993)	k → χ / _#	Fricativization
Carrier	Story (1984)	G,g,g^w,ɣ → ɣ,j,w,Ø / _#	Fricativization/ Gliding/ Deletion
Tojolabal	Furbee-Losee (1976)	j, w, h → ø / _#	Deletion

Table3. Samples of Lenition processes in intervocalic position

Language	Reference	Description of processes	Type of Process
Badimaya	Dunn (1988)	d,d^j → ð,ʒ/V__V	Fricativization
Dahalo	Tosco (1991)	b,d → β,ð/V__V	Fricativization
Gujarati	Cardona (1965)	b^h,d^h,g^h → β,ð,ɣ/V__V	Fricativization
Kupia	Christmas & Christmas (1975)	p → ɸ / V__V, ʈ,ɖ → ɾ /V__V	Deletion Flapping
Purki	Rangan (1979)	ɖ,d → ð / ɾV__V	Fricativization

2. Research Questions and Theoretical framework

We are going to study lenition in this paper according to the theoretical framework of generative phonology to answer the following questions:

1) How the mentioned processes are applied in Persian as lenition? In other words, how do the data support the application of lenition processes in Persian?
2) In which contexts do lenition processes apply in Persian?

So by dealing with related data we should reach to underlying representation through phonetic representation. In this case, we first discover the existent phonetic alternations. According to represented data, when one of the alternations appears in a place and the presence of the other is not possible the alternation between two features is cleared. After discovering the alternation, it is turn to discover the underlying representation of alternation. We use corpus internal evidence to reach this aim. First, two hypothesis are considered in this method. In one of the hypotheses, it is hypothesized that the first feature is underlying feature, unless there is some evidence to violate this idea. In the other hypothesis, it is hypothesized that the second feature is underlying feature, unless there is some evidence to violate this hypothesis. Formalizing of phonological rules is the next step after discovering the underlying representation. In this step the derivation of surface representation from underlying form is shown.

3. Methodology

Synthetic process typology of phonological processes, which is cited in table 1, is investigated according to the phonological pattern of Persian; finally the most frequent eleven processes which include: segment deletion, voicing, centralization, shortening, degemination, debuccalization, flapping, hiatus avoidance via linking or intrusive /n/, fricativization, gliding and cluster reduction are selected. To see how these processes are applied in Persian as lenition, Standard Persian and nine dialects out of twenty five dialects which show these processes are selected. The data are gathered in field study. Then, each of the above processes is probed on the cited varieties to find the alternatives and underlying forms which are important to decide how the lenition processes are applied in Persian and some of its dialects; and to find the positions in which lenition processes take place.

4. Data Presentation and Discussion

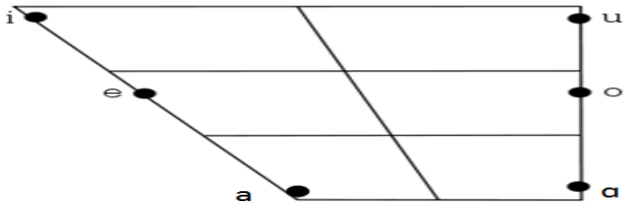
Before the representation of data, it seems necessary to represent Persian consonants table and vowels diagram:

Table 4. Persian Consonants (Kambuziya, 2006:111)

	Bilabial	***Labio-dental***	***Dental***	***Alveolar***	***Palato-alveolar***	***Palatal***	***Velar***	***Uvular***	***Glottal***
Plosive	p b		t d			c ɟ		ɢ	ʔ
Fricative		f v		s z	ʃ ʒ			χ	h
Affricate					tʃ dʒ				
Nasal	m			n					
Trill				r					
Lateral				l					
Glide						j			

Note: In Persian phonetic system, there are two palatal plosives /c/ and /ɟ/ but before back vowels they are pronounced [k] and [g], respectively; such as [kur] "blind", [ʔangur] "grips". So [k] and [g] are allophones of /c/ and /ɟ/ that make no meaning distinction.

Figure 1. Persian Vowels (Kambuziya; 2006:111)



4.1. Deletion

There is a complete lenition in segment deletion in Persian dialects according to fortition/lenition scale.

Standard Pesian	Mazandarani dialect	Gloss
/Gand/	[Gan]	"lump sugar"
/band/	[ban]	"rope"
/kelid/	[keli]	"key"
/tond/	[ten]	"fast"
/kond/	[ken]	"slow"
/tʃand/	[tʃan]	"some"

We can consider the [d] ≈ [Ø] alternation in Mazandarani dialect. There are two possible hypotheses of this alternation, depending on whether the [d] is underlying or [Ø] is posited as underlying.

H_1: if /d/ is underlying, a rule is needed to delete it at the end of the word.

/d/ → [Ø] / _ #

H_2: if /Ø/ is underlying, a rule is needed to change /Ø/ to the stop [d] at the end of the word.

/Ø/ → [d] / _ #

There are facts that motivate the (a) analysis. The first is that evidences from many languages show that word-final position is usually the context for deletion rather than insertion. The second reason is that as Haghshenas (1977, p.158) explains, if the combination of sounds in a string causes difficulty of pronunciation, certain sounds may delete in casual speech. Clearly from the articulatory point of view, the pronunciation of the cluster [-nd] poses difficulty of pronunciation. The third reason is that if we consider /Ø/ as underlying it is unclear why it changes to [d] and not to any other sounds. There is no phonological plausibility for the rule that can changes /Ø/ to [d] in the examples. And finally to support the idea of /d/ as underlying, we can say that the process of deletion of /d/ is very common, as finch (2000, p.46) writes /d/ and /t/ are the most frequently elided consonants.

4.2. Voicing

Standard Persiani	Sabzevari dialect	Gloss
/fet.ne/	[fed.na]	"sedition"
/xed.mat/	[xed.mad]	"service"
/sɑ.ʔat/	[sɑ.ʔad]	"hour"
/tɑ.but/	[tɑ.bid]	"coffin"
/sɑ.cet/	[sɑ.ced]	"quiet"

There are also two hypotheses for the alternation of [t] ≈ [d]:

H_1: The consonant /t/ is the underlying form and it is voiced at the end of syllable or morpheme.

/t/ → [d] / _ {$, #

H_2: The consonant /d/ is the underlying form and it loses [voice] feature at the end of syllable or morpheme.

/d/→ [t] / _ {$, #

Because, final position of syllable is usually the position of lenition, this process is also a kind of lenition. By making markedness theory to consideration, it is just unmarked item which appears in underlying form. The unmarked value of [voice] for stops is negative. Voiceless consonants have unmarked value and voiced consonants are considered as marked, so the given data in Standard Farsi which show an unmarked form, are underlying form, and Sabzevari dialect follow its specific rule and in this case is taken as marked. So the second hypothesis is acceptable.

4.3. Centralization

Standard Persian	Mazandarani dialect	Gloss
/dozd/	[dəz]	"thief"
/pol/	[pəl]	"bridge"
/boz/	[bəz]	"goat"
/morde/	[mərde]	"dead"
/sorx/	[sərx]	"red"

In a sense, when compared with the theoretical extremes of vowel articulation which define the cardinal vowels in phonetics, all real language vowels tend to be centralized, but the term is usually used to refer to cases where a vowel normally articulated in the periphery of the vowel area comes to be produced nearer to the center of the mouth. So we can decide from the alternation [o] ≈ [ə] that /o/ is underlying and it tends to be centralized.

4.4. Degemination

Standard Persian	Kermani dialect	Gloss
/hoGGe/	[ho:qe]	"trick"
/ɑrre/	[ʔɑ:re]	"definitely yes"
/batʃtʃe/	[ba:tʃe]	"child"
/ɟolle/	[qo:le]	"summit"

There are two hypotheses for the alternation of [ø] ≈ [C_1] (C_1 is the symbol of geminated consonant):

H_1: The standard Persian words are the underlying form and we need a rule for geminating C_1.

H_2: The Kermani dialect words are the underlying form and we need a rule for degemination of C1.

In order to define the underlying form, the following data are studied:

Standard Persian	Kermani dialect	Gloss
/dɑlɑn/	[dɑlũ]	"corridor"
/pɑlɑn/	[pɑlũ]	"packsaddle"
/mɑlec/	[mɑlec]	"owner"
/sɑlon/	[sɑlũ]	"saloon"
/sefid/	[s(ə)fid]	"white"

The first hypothesis is rejected by two reasons: first, gemination takes place in the environment of between two vowels. This environment is considered as one of the most important position of lenition, but gemination means fortition. Second, according to the data just above mentioned, the frequency of the words with geminated consonants is considerably lower than the frequency of the words without geminated consonants. Moreover, if we suppose there is a gemination consonant, the question which is raised here is that why does gemination only take place between two vowels and doesn't happen in other environments such as the onset, rhyme or coda of syllables? So the second hypothesis, i.e. deletion of one of the gemination components is approved. The rule of this process can be shown as follow: /C_1/ → [ø] / V_____ C V

4.5. Debuccalization

Standard Persian	Kermani dialect (Jirofti variety)	Gloss
/doxtar/	[dohtar]	"girl"
/bɑzu/	[bɑhug]	"arm"
/Gɑjem/	[kɑhõm]	"hidden"
/tavɑnestan/	[tahestã]	"to be able to"

There are two hypotheses for the alternation of [h] ≈ [C] (C can be [j], [z], [v] or [x]):

H_1: The consonant /C/ is the underlying form and we need a rule to change it to glottal fricative consonant [h] in the environment of between two vowels and at the end of syllable.

H_2: The glottal fricative consonant /h/ is the underlying form and we need some rules to change it to the consonants [j], [z], [v] and [x].

The second hypothesis is rejected, because the environment of between two vowels and at the end of syllable is considered as lenition position according to the phonetic acceptability criteria and the existed phonological change in the above data takes place in the mentioned position. The consonants /j/, /z/, /v/, /f/ and /x/ are all buccalized fricative consonants. They change to glottal fricative consonant [h] which is produced in pharynx and is considered as debuccalized consonant. Taking the second hypothesis into consideration from another point of view, we see that if the consonant /h/ wants to change to each of the consonants [j], [z], [v] or [x] different rules are needed, but this is against of economy principle in language. So the rule of this process can be shown as follow:

/C/ → [h] / {V___ $C_0$$, V___ V

5.6. Flapping

One of the allophones of /r/ in Persian is the voided flap [ɾ] which appears in the environment between vowels (Jensen, 2004:43).

UR	Persian dialects	Gloss
/ʃirini/	[ʃiɾini]	"pastry"
/birun/	[biɾun]	"outside"
/dorost/	[doɾost]	"correct"
/birang/	[biɾaŋ]	"pale"

According to kenstowicz (1994), intervocalic position is one of the places in which lenition happens and [ɾ] is one of the allophones of the phoneme [r] in Persian, so we can decide from [r] ≈ [ɾ] that [r] is underlying representation. The following rule shows this matter:

/r/ → [ɾ] / V ___ V

5.7. Hiatus avoidance via linking or intrusive /n/

There is no insertion of consonant in this characteristic of lenition, the consonant /n/ exists in underlying structure and is deleted because postvocalic context is the most typical environment for lenition, but it is appeared in other derivational processes; because the sequence of two vowels in the immediate vicinity seems to be 'illegitimate' and 'bad' as native speakers of the following dialects tend to break the sequence with the /n/ sound. It would be effortful to maintain a hiatus. Thus, this process has lenitive effects and can be classified as reduction of aerodynamic unnaturalness, which expends effort.

Standard Persian	Turbatian dialect	Gloss
/nun/	[nu]	"bread"
/nun+a/	[nu+a] → [nuna]	"loaves of bread"

Standard Persian	Lori dialect (Bala-Gueriveh variety)	Gloss
/zamin/	[zɛmi]	"land"
/zamin+ɑ/	[zɛmi +ɑ] → [zɛminɑ]	"lands"
/in/	[ʔi]	"this"
/in+ ɑ/	[ʔi+ ɑ] → [ʔinɑ]	"these"

The following shows the derivation of this process:

UR:	/#nun#/
Lenition Rule (deletion):	nu
Addition of plural morpheme:	nua
Lenition Rule (hiatus avoidance via intrusive /n/)	nuna
PR:	[nuna]

5.8. Fricativization

Standard Persian	Sabzevari dialect	Gloss
/naGʃe/	[nexʃa]	"map"
/saGf/	[saxf]	"ceiling"
/taGsir/	[texsir]	"guilt"
/maʃG/	[maxʃ]	"homework"
/bɑGtʃe/	[bextʃa]	"garden"
/naGʃ/	[naxʃ]	"figure"

By taking the above data into consideration, in order to define the underlying form, we can posit two hypotheses:

H_1: The consonant /x/ which is the underlying form changes to [G] in adjacent a voiceless consonant, the end of a word or a syllable.

H_2: The consonant /G/ which is the underlying form changes to [x] in adjacent a voiceless consonant, the end of a word or a syllable.

There are a lot of words in these dialects in which the phoneme /x/ doesn't change to [G] before a voiceless consonant, the end of a word or a syllable such as the following data adopted from Sabzevari dialect:

Standard Persian	Sabzevari dialect	Gloss

/dɑxtar/	**[dɯxtar]**	**"girl"**
/paxʃ/	**[paxeʃ]**	**"distribution"**
/jaxtʃɑl/	**[jextʃɑl]**	**"refrigerator"**
/raxtexɑb/	**[rextexow]**	**"bed"**
/baxʃ/	**[baxeʃ]**	**"part"**

So, the second hypothesis is proved and the phoneme /G/ is the underlying form. The other reason for accepting the second hypothesis is that a stop consonant usually changes to a fricative one after a vowel. /G/ becomes voiceless because it is adjacent to a voiceless consonant; and it becomes fricative because it is affected by nuclear vowel as all vowels are [+continuant]. In other words, this process happens because of a consonant cluster in which the first consonant is plosive and voiced phoneme /G/, and the next consonant is a voiceless and obstruent consonant, the consonants show a strong tendency to assimilate in [voice] and [continues] features. At first, in this change the plosive – voiced consonant /G/ loses its voicing feature because of being adjacent to a voiceless consonant and changes to its voiced pair /q/. Then in the next phase this consonant through lenition processes changes to voiceless-fricative consonant [x].

The assimilation process of /G/ in [voice] feature is feeding for the occurrence of lenition process of /q/ and changing it to proportionate fricative:

UR:	**/#naGʃe#/**
Assimilation Rule:	**naqʃe**
Lenition Rule:	**naxʃe**
PR:	**[naxʃe]**

5.9. Gliding

Standard Persian	Sabzevari dialect	Gloss
/sɑbidan/	**[sowijan]**	**"to grind"**
/zadan/	**[zijan]**	**"to hit"**
/dɑdan/	**[dojan]**	**"to give"**
/taracidan/	**[tercijan]**	**"to burst"**
/boridan/	**[borrijan]**	**"to cut"**

Another kind of alternation in the above data is [d] ≈ [j]. The infinitive sign in standard Persian is "dan", but it is seen as "jan" in Sabzevari dialect. There are two hypotheses for this alternation:

H_1: The Sabzevari dialect's words are underlying form and the consonant /j/ in intervocalic position changes to [d].

/j/ → [d] / V _ V

H_2: The standard Farsi words are underlying form and the consonant /d/ in intervocalic position changes to [j].

/d/ → [j] / V _ V

There are two reasons for rejecting the first hypothesis:

(a): The intervocalic position is a position for lenition not fortition.

(b): There are a lot of words in Sabzevari dialect which have the consonant /j/ in its underlying structure that doesn't change to [d] in intervocalic position such as:

Standard Persian	Sabzevari dialect	Gloss
/pijɑle/	**[pijɑle]**	**"goblet"**
/sijɑh/	**[sijɑh]**	**"black"**
/rije/	**[rija]**	**"lung"**
/pijɑde/	**[pijada]**	**"on foot"**
/dije/	**[dija]**	**"blood money"**

The above argumentation shows that in spite of being in intervocalic position the consonant /j/ does not change to [d], so the second hypnosis is accepted.

5.10. Cluster reduction

Standard Persian	Eqlidi dialect	Gloss
/cɑrd/	**[ce]**	**"s/he did"**
/xord/	**[xo]**	**"s/he ate**
/mord/	**[mo]**	**"s/he died**
/ɑvard/	**[ʔowo]**	**"s/he brogut"**
/bord/	**[bo]**	**"s/he took"**

In this dialect –rd consonant cluster in the verbs in 3rd person simple past form is deleted:

/rd/→ [Ø] / CV _ #

From the alternation [rd] ≈ [Ø] we can decide that [rd] is the underlying representation, because:
(a): Word final position is usually the context for the application of deleting rule.
(b): If we consider/Ø/ as underlying form, it is vague why it changes to [rd] and not to any other sounds. There is no phonological plausibility for the rule that can changes [Ø] to [rd] in the above data.

5.11. Shortening

Standard Persian	Sabzevari dialect	Gloss
/xɑ.ne/	[xa.na]	"house"
/lɑ.ne/	[la.na]	"nest"
/pi.jɑ.le/	[pi.ja.la]	"beaker"
/ha.vɑ.le/	[ha.wa.la]	"draft"
/kɑ.Gaz/	[ka.Gaz]	"paper"
/lɑ.Gar/	[la.Gar]	"thin"

The above data shows a phonological alternation between [ɑ] ≈ [a]. There are two hypotheses to define the underlying form:

H_1: We should consider the vowel [a] as the underlying representation in Sabzevari dialect. In this case, a rule is needed to change the feature [-back] of the vowel to the feature [+back] in standard Persian.

H_2: We should consider the vowel [ɑ] in the first syllable as the underlying representation in standard Persian. In this case, a rule is needed to change the feature [+back, +low] of the vowel to the feature [-back, +low] in Sabzevari dialect.

To find the reason of changing /e/ in final position of the words of standard Persian into [a] in the words of Sabzevari dialect first, we should take a historic point of view into consideration. The historic considerations (McKenzie 2000) show that some of the modern Persian words ended to the suffix [-ag] in Pahlavi words such as the following data:

Pahlavi	Standard Persian	Gloss
/midʒag/	[moʒe]	"eyelash"
/taxtag/	[taxte]	"board"
/pajmɑnag/	[pejmɑne]	"module"
/pistag/	[peste]	"pistachio"
/pardag/	[parde]	"curtain"

In middle Persian, new nouns were created by adding the prefix [-ag] to the final position of some words like:

Pahlavi	Middle Persian	Standard Persian	Gloss
/nɑm/	/nɑmag/	[nɑme]	"letter"
/xɑn/	/xɑnag/	[xɑne]	"house"
/dʒɑm/	/dʒɑmag/	[dʒɑme]	"costume"

By passing the time and through the deletion of –g (a kind of lenition process), these kind of Pahlavi and middle Persian words ended to the vowel [a] in modern Persian. There is no letter to show [a] in modern Persian writing system, so the grapheme "h" was used which is technically called "inarticulate or hide h". In this case the remained vowel /a/ is pronounced [e] in standard Persian such as the above data. Based on the cited information, we can conclude that the final vowel /a/ is the underlying form and it is preserved in sabzevari dialect; but it changes to the vowel [e] in standard Persian.

By considering Pahlavi and middle Persian words once again, we find their first syllables had the vowel /ɑ/. So we can consider this vowel as the underlying form through the historical point of view. It is mentioned that the final vowel [a] is preserved in Sabzevari dialect, in this case for assimilating the vowels and for ease of articulation the existed vowel /ɑ/ in these words change to the vowel with the feature [-back] i.e. [a]. This process is also applied in the middle syllables which contain the vowel /ɑ/. So according the above justification, the first hypothesis is rejected, and it can be shown as the following rule:

/ɑ/ → [a] / _____$ Ca(C) #

4. Conclusion

The collected data from Standard Persian and some of its dialects support the lenition processes in Persian as eleven processes. The data shown that the lenition processes tend to occur in postvocalic, intervocalic and final positions as follows:

Table 5. The position of lenition processes in Persian dialects

Lenition processes	Position		
	Final	Postvocalic	Intervocalic
Deletion	√	√	-
Degemination	√	-	-
Flapping		-	√
Gliding	√	√	√
Voicing	√	√	-
Debuccalization	√	√	-
Fricativazation	√	√	√
Cluster Reduction	√	√	-
Centralization	-	-	-
Shortening	√	-	-
Hiatus avoidance via linking or intrusive /n/	-	-	√

As can be seen from the above tables, the final position has the high frequency for lenition processes to occur. This support Kenstowichz's idea (1994, p.35) which mentions that word final is the typical position for lenition.

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