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ELISION OF /H, ?/ IN THE SHIRAZI DIALECT OF PERSIAN (SHDP): AN OPTIMALITY THEORY BASED ANALYSIS

Until recently, many researchers have shown interest in studying lenitions, which are examples of the most common universal types of phonological processes. Elision of laryngeals (glottal fricative /h/ and glottal stop /?/) is one of the most common phonological alternations exhibited in the Shirazi dialect of Persian (SHDP) which to the knowledge of the researchers, has not been studied to date. This paper seeks to provide a description of the facts about this common phonological alternation in the addressed regional dialect of Persian and points out some main differences between the behavior of these processes in SHDP and Standard Persian (SP). The analysis is cast in an Optimal Theoretic (OT) framework (McCarthy and Prince 1995, 2001), which holds that linguistic forms are the outcome of interaction among violable universal constraints. The present study shows that the addressed processes of consonant deletion in SHDP are restricted by syllabic position and are conditioned by coda position, intervocalic position or consonant clusters. They are usually blocked in the onset, but there are cases where reduction is allowed in the onset of the stressed syllable. Thus, the study adds SHDP to the list of languages which permit lenition in the onset of the stressed syllable. The addressed processes of elision are always blocked in word-initial position and laryngeal elision is always followed by Compensatory lengthening (CL), even after deletion from the onset of the stressed syllable.

1. Introduction

Elision is an example of a greater category of universally common phonological alternation processes called *lenition* by Swiss linguist Thurneysen in 1898. Consonant lenition is commonly known as an alternation which yields a consonant that is articulated with a more sonorous manner of articulation; a process by which a consonant becomes weaker; in other words it becomes more vowel-like or less consonantal. Elision is the most extreme kind of lenition process by which a segment weakens to Ø. As various cross-lingual surveys illustrate, lenition is a unified process which almost all languages undergo. Based on universal surveys done in this area, Kirchner (1998) believes that lenition appears to be frequently conditioned by: 1- Intervocalic position, 2- Coda position, 3- Final position.

Lenition blocking or fortition environments are: 1- Word-initial position, 2- Onset of stressed syllables.

Laryngeal elision is common in various phonological environments in natural languages. Some cases of laryngeal deletion in typologically weak positions can be listed in the following table (adopted from Kirchner 1998, Lavoie 2001):

Table (1): Some cases of laryngeal elision in natural languages

Language	Reference	Elision pattern
Hawaiian	Elbert & Pukui 1979	h → Ø / V__V
Pennsylvania German	Kelz 1971	h → Ø / V__V
Sanuma	Borgman 1986	h → Ø / V__V
Blackfoot	Frantz 1971, Proulx 1989	h → Ø / V__
Gbeya	Samarin 1966	? → Ø / V__V
Korean	Martin 1992	h → Ø / +voi__+voi
Nepali	Bandhu 1971, Acharya 1991	h → Ø / V__C
Newari	Nanda 1971	h → Ø / V__V (inducing breathiness on the following vowel)
Southern Tati (Chali dialect)	Yar–Shater 1969	h → Ø except initially and in onset of stressed syllable, results in compensatory lengthening of preceding syllable
Tojolabal	Furbee–Losee 1976	h → Ø /__#

Tümpisa Shoshone	Dayley 1989	h,? → Ø (morphologized context, phonological factors unclear)

The main goal of this study is to determine how h-loss and ?-loss in SHDP are conditioned based on the generalizations proposed for this category of phonological alternations driven from cross-lingual studies on a large number of languages and how this common process of weakening in the addressed regional dialect of Persian can be analyzed in Optimality Theory (McCarthy and Prince 1995, 2001). The significance of the present study, however, lies in the fact that in the first place it deals with the characteristics of lenitons. To the knowledge of the researchers there are few studies on lenitions in Standard Persian (SP) or any other variety of this language; although there are numerous interesting cases of lenitions in various varieties of Persian such as SHDP. In the second place, the analysis is cast in OT. As far as the researchers know, one encounters few studies on Persian in any subfields of linguistics which follow OT assumptions although as the most explanatory adequate version of generative grammar, it has offered insightful solutions specifically to the problems of phonology.

2. Theoretical Framework of the study

Optimality theory or *OT* is a linguistic model proposed by Prince and Smolensky in 1993. Optimality theory is usually considered as a development of generative grammar.

The basic formal element of the Optimality Theory is the *constraint*. OT proposes two basic kinds of constraints rather than rules, to map input-output relationship. Constraints are of two basic types. Markedness constraints focus on the form of the output structure penalizing it for the presence of certain configurations. Faithfulness constraints evaluate the relationship between input and output forms, demanding *exact replication* of the input. The set of constraints is universal and languages differ with regard to the difference in the ordering or ranking of the constraints in this universal set not because of the presence or absence of constraints. The winning or the *optimal* output form is selected as the best from a set of possible forms known as *candidates*. The basic structure of the theory can be illustrated in the form of the diagram below:

Figure (1): Basic OT architecture, adopted from McCarthy (2002, p. 10)

3. Method

In this study, the data were collected from various sources. Data contained some natural recorded material a part of which included some casual conversations among friends and family members recorded at small parties and reunions. The raw data also included some recorded casual conversations among people in the Bank.e. Mellat, the branch of Shiraz University. There were also some recordings of casual conversations and interviews in different radio and TV programs from Fars provincial TV and radio channels. The data corpus also included 2 audio CDs of Shirazi poems. One audio CD includes 55 recent Shirazi poems by Yadollah Taromi, from the collection of Shirazi ballads bahār-e nārenj (2003), read by the poet. The other one includes 7 Shirazi poems read by Mohammad Ali Bagheri. There were also some written materials which include three Shirazi poem collections written by Bijan Samandar employing both Farsi writing system and IPA. The written version and IPA transcribed version of bahār-e nārenj (2003) was also available as a source for collecting data. The raw data were transcribed and all existing cases of laryngeal deletion as well as the phonological environments, in which the processes take place, were recognized. The data then were analyzed based on Optimality Theory framework.

4. Laryngeal elision in SHDP

The observations made reveal that in SHDP glottal consonants /h, ?/ are deleted in all typologically weak positions: coda-position (word-internally or word-finally), intervocalic position and in clusters but they are retained word-initially. Thus, the phenomenon is restricted by syllabic position. Lenition of laryngeals to Ø may apply equally to all syntactic categories. In general, all structurally related nouns, adjectives and verbs follow their base with respect to lenition. It should be pointed out that, sociolinguistic factors such as age, level of education and degree of formality may affect the process. Furthermore, highly frequent items or more familiar ones are more likely to undergo the process of

laryngeal deletion. It is obvious that these tendencies illustrate the optional nature of the process. Thus, whenever laryngeal elision in SHDP is permitted, it is always optional with regard to sociolinguistic factors.

4.1 Elision of /h/: A historical overview

The glottal fricative /h/ has undergone the lenition process of elision during the history in Persian. Word-final position, coda position and even initial position were the hosting places for laryngeal elision of /h/ diachronically. The following data set provides us with some diachronic information about elision of /h/:

Table (2): Elision of /h/ diachronically: (Bagheri 1994, Abolghasemi 1999)

	Old Persian	Middle Persian	Modern Persian of today	English
Coda	hazahra	hazār	hezār	thousand
word-final		rāstih	rāsti	virtue
		tārikih	tāriki	darkness
	vahunamah	vahman	bahman	A person with good thought
		tišnakīh	tešnegi	thirst
		dōstīh	dusti	friendship
Initial	hizvā	huzvān	zabān	tongue
		hayyār	yār	beloved, friend
	Avestāi			
Cluster	vəhrka	gurg	gorg	wolf

Another common diachronic lenition process in Persian is debuccalization or lenition of a non-glottal consonant to a glottal one. Persian historical survey reveals that the unvoiced fricative /θ/, which was found in a large number of word forms in Old Persian, debuccalized to /h/ in different environments historically. The following table includes some examples of debuccalization to /h/ in diachrony:

Table (3): Debuccalization phases (Bagheri 1994, Abolghasemi 1999)

	Old Persian	Middle Persian	Modern Persian of today	English
Coda	parθava-	pahlav	pahlavān	hero
	xšaθra-	šahr	šahr	city
	xšāθiya-	šāh	šāh	king
	miθra-	mihr	mehr	Kindness, name of an ancient Persian god
Onset	rāθa-	rāh	rāh	way, path
	gāθu-	gāh	gāh	time

Based on the typology of lenition (Escure 1977, Lass 1984, Hock 1991, Kirchner 1998, Lavoie 2001, etc.), elision of the glottal fricative is expected to take place after debuccalization in diachrony. Universally speaking, since laryngeals are one of the least strong segments, obsturents have the tendency to weaken to laryngeals and laryngeals ultimately are deleted during the history. SHDP data reveals that the dialect is following the typical expected universal pattern of lenition. Consider examples in Table (3). /h/ in these cases, which is the result of a debucalization process, is deleted by SHDP speakers in their speech. The following table covers diachronic alternations from Old Persian to SHDP:

Table (4) Debuccalization to /h/ diachronically and h-loss in SHDP

	Old Persian	Middle Persian	Modern Persian of today (SP)	SHDP	English
Coda	parθava-	pahlav-	pahlavān	pa:lavān	hero
	xšaθra-	šahr	šahr	ša:r	city
	xšāθiya-	šāh	šāh	šā:	king

	miθra-	mihr	mehr	me:r	Kindness, name of an ancient Persian god
Onset	rāθa-	rāh	rāh	rā:	way, path
	gāθu-	gāh	gāh	gā:	time, early

4.2 Elision of /h/ in SHDP

As mentioned before, /h/ lenites to Ø in SHDP in all typologically weak environments but it is retained word-initially. Some examples of h-loss in SHDP are provided in the following sample set of data which demonstrates that the process is restricted to syllabic position:

Table (5): Elision of /h/ in SHDP, sample data

	Elision of /h/	English
Coda	mehrabān > me:rabun	kind
	tehrān > te:run	Tehran
	tahsilāt > ta:silāt	education
	māhvāre > mā:vāre	satellite
	mohtāj > mo:tāj	needy
	kohne > ko:ne	old
	mihmāni > me:muni	party
	šāh > šā:	king
	kuh > ku:	mountain
	tozih > tozi:	explanation
	leh > le:	crushed
	deh > de:	village
	dah > da:	ten
	tah > ta:	bottom of something
CC cluster		
	šahr > ša:r	city
	mahz > ma:z	for one's sake

	tarh > ta:r	plan, drawing
	mahr > ma:r	portion
	zehn > ze:n	mind
Intervocalic position		
	dahān > da:n	mouth
	mahalle > ma:lle	district
	sāhebxāne > sā:bxune	landlord
	xāhar > xā:r	sister
	pišnahād > pišnā:d	suggestion
	jahāz > jā:zi	dowry
	mosāhebe > mosā:be	interview

Table (6): Retention of /h/ word initially, sample data

[herefti]	very much
[hākak]	yawn
[holofti]	completely
[hortoli]	rough and unsuitable
[hasin]	big pottery flowerpot
[herre]	a kind of arch shaped structure in the edge of the roofs
[hā]	yes (informal)
[hombār hombār]	slowly
[howli hammāli]	the act of playing see-saw
[hālo]	now

Obviously, one of the important features of phonological system of SHDP is the so called Compensatory Lengthening (CL). »Compensatory lengthening refers to the process whereby the deletion of a segment is compensated for by the lengthening of a neighboring segment. Hayes (1989) attributes the phenomenon to the fact that although a segment is lost, its timing unit – its mora – is not, but simply re-associates to an adjacent melodic unit« (Topintzi 2006, p. 1).

The process of compensatory lengthening is restricted. If the deleted segment is mora-bearing, the adjacent vowel lengthens to compensate for the deletion of the mora so that the weight of the syllable does not change. But if the deleted segment is not moraic, there is no need for lengthening since deletion of a non-moraic segment does not affect the weight of the syllable. Since, based on the direct consequence of mora-based theory, onset of the syllable is considered to be non-moraic, elision of onset does not prompt CL but elision of syllable coda or word-final segment does. Kambuzia (2000, cited in Kambuzia & Alavi 2004) discusses that onset is moraic in Persian based on the behavior of geminates in SP. Since in SHDP, deletion of /h/ from the onset of stressed syllables is followed by CL, following Kambuzia (2000, cited in Kambuzia & Alavi 2004), onset is considered to be moraic in this study. As explained by Darzi (1991, cited in Kambuzia & Alavi 2004) and Kambuzia (2000, cited in Kambuzia & Alavi 2004), deletion of glottal fricative /h/ just like the glottal stop /?/, leads to compensatory lengthening in SP. Data illustrates that in SHDP, CL takes place when laryngeals are deleted which can sometimes be meaning distinctive:

/še?r/ → [še:r] ‘poem’ [šer] ‘torn’

Mahootian (1997) believes that in SP, »CL is applicable only when /h/ is deleted between a vowel and a consonant« (p. 329–333). In SHDP, however word-internal h-deletion in all typologically weak environments is always followed by CL which can be meaning distinctive as the following sample data reveals:

/tarh/	[ta:r]	‘design, plan’	[tar]	‘wet’
/māh/	[mā:]	‘the moon’	[mā]	‘we’
/kuh/	[ku:]	‘mountain’	[ku]	‘where’
/xāhar/	[xā:r]	‘sister’	[xār]	‘spine’
/zahr/	[za:r]	‘poison’	[zar]	‘gold’

4.2.1 An OT analysis of h-deletion within morpheme boundaries

In order to not violate one of the most fundamental notions centrally related to the output-oriented theory of OT which is the notion of richness of the base, in this study following Topintzi (2006), CL is considered to be a process of position preservation via a mora which does not rely on input moras and their preservation. Thus, based on this proposal, the following constraint is considered to be responsible for the process of CL:

(1) **POSCORR (position correspondence):** An input segment must have an output correspondent either segmentally by means of a root node or prosodically by means of a mora.

The process of h-loss in SHDP can be coded in constraint interaction termed as follows:

(2) **HAVE-PLACE** (Adopted from McCarthy 2006)

Consonants that lack an oral constriction are disfavored.

Constraint (2) disfavors all laryngeals since they lack oral constriction. In SHDP, /h/ is disfavored in all typologically weak environments but is retained in word-initial position. Thus, the constraint (3) must be ranked above HAVE--PLACE in the grammar of SHDP:

(3) **PRES(asp)/ # __**

Preserve [+ asp] segments in word-initial position.

Another constraint which involves the process is the following:

(4) **DEP-μ**

Syllable positions must be filled with underlying prosodic unit. (No μ- insertion).

In SHDP, /h/ lenites to Ø in all environments but word-initial position, therefore the constraint PRES(asp) /#__ is ranked above HAVE-PLACE to penalize deletion of /h/ in word-initial position. HAVE-PLACE must be ranked above POSCORR in the hierarchy and DEP-μ must be dominated by all above constraints since the optimal candidate is the one with deleted /h/ and lengthened preceding vowel. Therefore, we come to the following constraint ranking:

PRES (asp)/#__ >> HAVE-PLACE >> POSCORR >> DEP-μ

The following tableaus account for h-loss in word-final position, coda position and lenition blocking in word-initial position:

Tableau (1):

/rāh/ → [rā :]

/r^{1}μā^{2}μμ h^{3}μ / ‘path’	PRES (asp)/#__	HAVE-PLACE	POSCORR	DEP-μ
→ a. [r^{1}μā^{2}μμμ]				*
b.[r^{1}μā^{2}μμ]			*!	

c.[r¹μā²μμμ h³μ]		*!		

Tableau (2):

/kohne/ → [ko:ne]

/k¹μo²μh³μ n¹μe²μ/ ‘old‘	PRES (asp)/#__	HAVE-PLACE	POSCORR	DEP-μ
→ a.[k¹μo²μμ n¹μe²μ]				*
b.[k¹μo²μ n¹μe²μ]			*!	
c.[k¹μo²μh³μnμ¹e²μ]		*!		

Tableau (3):

/hākak/ → [hākak]

/ h¹μā²μμ k¹μa²μk³μ / ‘yawn’	PRES (asp)/#__	HAVE-PLACE	POSCORR	DEP-μ
→ a.[h¹μā²μμ k¹μa²μk³μ]		*		
b.[ā²μμ k¹μa²μk³μ]	*!			
c.[ā²μμμ k¹μa²μk³μ]	*!		*	*

As Mahootian (1997) attested, intervocalic h-deletion takes place in SP only when /h/ is preceded and followed by the same vowel. In these cases, both /h/ and the following vowel are deleted. But, this process is restricted only to a few word forms such as the following example in SP: /čehel/ → [čel]. In SHDP however, intervocalic h-elision is not restricted to the position where the preceding and the following vowel are the same. Data reveals that in this dialect lenition of /h/ to Ø is quite common in intervocalic position but it is followed by CL. The sequence of VV is disallowed in SHDP. This fact can be coded in a constraint termed *VV which disfavors the existence of more than one vowel in syllable peak.

(5) ***VV**: a sequence of two vowels is prohibited.

Obviously, the dominance of *VV over HAVE-PLACE or PRES(asp) /#__ does not affect the process of optimal candidate selection neither vice-versa but as demonstrated in tableau (4) without considering *VV in the hierarchy, the wrong candidate (e) will win. Thus, we come to the following conclusion that *VV must

be ranked above POSCORR to account for the correct optimal candidate selection in SHDP. Thus, Tableau (5), may explain the intervocalic h-elision in SHDP.

PRES (asp)/#__ >> HAVE-PLACE,*VV >> POSCORR >> DEP-μ

Tableau (4)

/dahān/ → [da: n]

/d¹μa²μ h¹μā²μμ n³μ /	PRES(asp)/#__	HAVE-PLACE	POSCORR	DEP-μ
→ a.[d¹μa²μμ n³μ]			**!	*
b.[d¹μa²μ n³μ]			***!	
c.[d¹μa²μh¹μā²μμn³μ]		*!		
d.[d¹μa²μ ā²μμ n³μ]			*!	
☹ e.[d¹μa²μμā²μμn³μ]				*

Tableau (5)

/d¹μa²μ h¹μā²μμ n³μ / 'mouth'	PRES (asp)/#__	HAVE-PLACE	*VV	POSCORR	DEP-μ
→ a.[d¹μa²μμ n³μ]				**	*
b.[d¹μa²μ n³μ]				***!	
c.[d¹μa²μh¹μā²μμn³μ]		*!			
d.[d¹μa²μ ā²μμ n³μ]			*!	*	
e.[d¹μa²μμā²μμn³μ]			*!		*

Onset of stressed syllable is one of the strong positions in which lenition doesn't take place in many languages. Bakovic (1995), discussing spirantization in Spanish, believes that the force behind this fortition is a constraint, STRONG ONSET, interacting with other constraints in the grammar of this language. In SHDP, however, one encounters cases of h-elision in onset of the stressed syllable. The stressed onset may be positioned between two vowels or between a vowel and a consonant. Consider the following examples:

Table (7): h-deletion in the stressed syllable onset within morpheme boundary, sample data

tan ‘hā > ta:no	lonely, alone
mosā ‘hebe > mosā:be	interview
ta ‘hammol > ta:mmol	Patience, ability to bear unpleasant things
xā’har > xā:r	sister
?es ‘hāl > ?esā:l	diarrhea
ša’hāmat > šā:mat	courage

The OT analysis of the process in [ta:no] as an example of the above cases, is presented as follows:

Tableau (6)
/tan’hā/ → [ta:no]

/t¹μa²μ n³μ hā²μμ / ‘alone’	PRES (asp)/#__	HAVE-PLACE	*VV	POSCORR	DEP-μ
→ a.[t¹μa²μμ n³μoμ]					*
b.[t¹μa²μ n³μoμ]				*!	
c.[t¹μa²μn³μh¹μā²μμ]		*!			

4.2.2 Paradigmatic effects on h-deletion

As Mustafavi (2006) mentioned, it is observed universally that word forms which are related inflectionally, derivationally or in both ways resist or apply certain phonological processes to keep identity with the rest of the members of the paradigm they belong to. In OT, the force behind this faithfulness to the base is proposed to be some output-output faithfulness constraints (McCarthy & Prince 1995). Generally, related forms follow their base with respect to h--deletion in SHDP. If the base undergoes h-deletion so does the noun or adjective which is inflectionally or derivationally related to the base. This is true for compound or complex structures, too. Usually, if a word-form on its own undergoes lenition, it would undergo the process if it is inside a compound or a

complex word form, too. This outcome is considered to be due to an OO-faithfulness constraint which acts as a barrier against deletion of the feature [+asp]. The constraint can be defined as follows:

(6) **MAX-OO (+asp)**
Every [+asp] specification in a base form is present in related forms.

Table (8): Paradigmatic effects on h-elision, sample data

Base	**Related morphologically non-simple forms**
šā:	šā:rox→ šāh + rox šā:čerāq→ šāh + čerāq šā:tut→ šāh + tut šā:rag→ šāh + rag šā:kār→ šāh + kār šā:nešin→ šāh + nešin
rā:	rā:nemā→ rāh + nemā rā:nemāi→ rāh + nemā + i rā:peymāi→ rāh + peymā + i rā:row→ rāh + row
ša:r	ša:rdār→ šahr + dār ša:rdāri→ šahr + dār + i ša:ri→ šahr + i ša:rak→ šahr + ak ša:rzād→ šahr + zād
ku:	ku:sorsori→ kuh + sorsore + i bowku:yi→ bābā + kuh + y + i
me:r	me:rnāz→ mehr + nāz me:rali→ mehr + ?ali me:ri→ mehr + i me:rābād→ mehr + ?ābād

In Tableau (7), the paradigmatic effects on h-loss are illustrated.

Tableau (7)

i./r^{1}μā^{2}μμ h^{3}μ / ‘path’	MAX -OO (+asp)	PRES (asp) /#__	HAVE -PLACE	POSCORR	DEP- μ
→ a. [r^{1}μā^{2}μμμ]					*
b.[r^{1}μā^{2}μμ]				*!	
c.[r^{1}μā^{2}μμ h^{3}μ]			*!		
ii. /rāh + nemā/ ‘guide’ ii./r^{1}μā^{2}μμh^{3}μ n^{1}μe^{2}μm^{1}μā^{2}μμ/					
→ a.[r^{1}μā^{2}μμμn^{1}μe^{2}μm^{1}μā^{2}μμ]					*
b.[r^{1}μā^{2}μμn^{1}μe^{2}μm^{1}μā^{2}μμ]				*!	
c.[r^{1}μā^{2}μμh^{3}μn^{1}μe^{2}μm^{1}μā^{2}μμ]	*!		*		

Tableau (8) demonstrates that whenever lenition is blocked in the base it is also blocked in the related form. In (i), lenition is blocked because /h/ is positioned word-initially. In (ii), /h/ neither undergoes the process of deletion.

Tableau (8)

i./h^{1}μe^{2}μ n^{1}μā^{2}μμ / ‘henna’	MAX-OO(+asp)	PRES (asp)/#__	HAVE-PLACE	POSC ORR	DEP -μ
→ a.[h^{1}μe^{2}μ n^{1}μā^{2}μμ]			*		
b.[e^{2}μ n^{1}μā^{2}μμ]		*!		*	
c.[e^{2}μμ n^{1}μā^{2}μμ]		*!			*
ii. /henā + i / ‘dyed with henna’ ii./ h^{1}μe^{2}μ n^{1}μā^{2}μμ y^{1}μi^{2}μμ/					
→ a.[h^{1}μe^{2}μn^{1}μā^{2}μμ y^{1}μi^{2}μμ]			*		
b.[e^{2}μ n^{1}μā^{2}μμ y^{1}μi^{2}μμ]	*!	*		*	
c.[e^{2}μμn^{1}μā^{2}μμ y^{1}μi^{2}μμ]	*!	*			*

Another observation about h-deletion in morphologically non-simple word forms in SHDP deals with h-deletion in the onset of stressed syllables. Across morpheme boundaries, /h/ lenites to Ø in the onset of stressed syllables whether it is preceded by a consonant or a vowel. Since VV cluster is disallowed in SHDP, *VV must dominate POSCORR so that the correct candidate is selected as optimal. The following sample data reveals this fact about h-elision in morphologically non-simple word-forms:

Table (9): h-deletion in onset of the stressed syllable in non-simple words

Elision of /h/	**English**
xoš'hāl > xošā:l (xoš + hāl)	glad
sob'hāne > so:bune (sobh + āne)	breakfast
ja 'hāni > jā:ni (ja hān + i)	universal
ta 'hiye kerdan > ta:ye kerdan (ta hiye + kerdan)	to prepare
siyā:'hi > siyā:yi (siyā: h + i)	darkness

OT account of the above examples is presented as follows:

Tableau (9)
xoš 'hāl → xošāl

/x¹μo²μš hμ¹ā²μμ l³μ / 'glad'	PRES (asp)/#__	HAVE-PLACE	*VV	POSCORR	DEP-μ
→ a.[x¹μo²μš¹ā²μμμl³μ]					*
b.[x¹μo²μš¹ā²μμl³μ]				*!	
c.[x¹μo²μšhμ¹ā²μμl³μ]		*!			

Tableau (10)
ja'hāni → jā:ni

/j¹μa²μ h¹μ ā²μμn¹μi²μμ/ 'universal'	PRES (asp) /#__	HAVE-PLACE	*VV	POSCORR	DEP-μ
→ a.[j¹μā²μμμ n¹μi²μμ]					*
b.[j¹μa²μh¹μā²μμn¹μi²μμ]			*!	*	
c.[j¹μa²μh¹μā²μμn¹μi²μμ]		*!			*
d.[j¹μa²μh¹μā²μμn¹μi²μμ]			*!		*

4.3 History and distribution of the glottal stop in Persian: An overview

It can be concluded from diachronic studies that the glottal stop, /?/, has entered the phonological system of Persian from Arabic which was declared to be the official language of Iran for two centuries after the country was occupied by Arabs in 651 A.D. (Bagheri 1994). This sound gradually entered the phonemic inventory of Dari (the court language) although linguists have not come to agreement about its phonemic status in Persian since the distribution of /?/ in Arabic loan words and Persian word forms is quite different. As Bijankhan (2005) mentions, Nye (1995), Giunašvili (1965), Samare (2002), Scot (1964) etc., believe in the phonemic status of /?/ in Persian without considering any difference among Arabic loan words and original Persian forms in this respect. Samare (1977, cited in Bijankhan 2005) proves that /?/ is phonemic in all phonological environments whether word forms are originally Persian or Arabic. He employs minimal sets like the following:

sabr , babr , jabr , qabr , gabr , ?abr

patience, panther, constraint, grave, Jewish, cloud

But the important point here is that /?/ is naturally almost never pronounced across morpheme boundaries when another morpheme ending in a consonant is added to originally Persian word forms beginning in /?/ but is not deleted when the additional morpheme ends in a vowel. Consider the examples below (Bijankhan 2005, p. 162):

ham + ?āhang → hamāhang ‘in harmony’
dard + ?angiz → darangiz ‘painful’
bi + ?āb → bi?āb ‘dry’
bā + ?adab → bā?adab ‘polite’

Thus, one can come to the conclusion that /?/ in the above cases is employed to repair VV cluster which is disallowed in Persian. Kambuzia (2003, cited in Bijankhan 2005) discusses the distribution of /?/ in Arabic loan words and originally Persian words in the theoretical framework of generative phonology. She concludes that /?/ in loan words is underlyingly phonemic but in native forms glottal stop is employed to fill the onset of the syllable since onset in Persian is obligatory. Generally speaking, as Bijankhan (2005) cited, /?/ is more prone to loss than other stops since it lacks an oral constriction.

4.3.1 Elision of /?/ in SHDP within morpheme boundaries: An OT analysis

In SHDP, /?/ lenites to Ø in coda position, word-final position and in clusters; but like /h/ it is retained word-initially. As far as the observations reveal, whenever /?/ is found in intervocalic position, it undergoes deletion even when /?/ is positioned in the onset of the stressed syllable. In order to account for ?-elision in OT, let us first consider the following data set:

Table (10): Elision of /?/ in SHDP

	Elision of /?/	English
Word-finally	šuru? > šuru:	beginning
	sanāye? > sanāye:	industry
	mowzu? > mowzu:	subject
	sari? > sari:	fast
	mamnu? > mamnu:	forbidden
	šojā? > šojā:	brave
	defā? > defā:	defending
	māne? > māne:	obstacle
Coda	za?farun > za:farun	saffron

	ta?rif > ta:rif	complement
	ta?til > ta:til	closed
	šo?le > šo:le	flame
	da?vat > da:vat	invitation
	sa?di > sa:di	Name of a poet & a district in Shiraz
	ya?ni > ya:ni	means
	me?de > me:de	stomach
Cluster	šam? > ša:m	candle
	še?r > še:r	poem
	na?l > na:l	horse shoe
	jam? > ja:m	gathering
	qat? > qa:t	cutting
	ta?m > ta:m	taste
Intervocalic position	motāle?e > motāle:	studying
	mo?ā yene > mā:yene	revise
	tabi?i > tabi:yi	natural
	mo?attal kerdan > mā:tal	To keep S.O waiting
	beqā?ede > beqā:de	rule governed
	ta?ārof > tā:rof	complement
	mo?āmele > mā:mele	deal
	mi?āmadand > mi:madan	They were coming

Table (11): Retention of /?/ word-initially

?ow	water
?alow	fire
?al	ridicules
?ay	if
?ume	he/she came
?i	this
?ololak	scarecrow
?ālu	potato
?āmu	but, uncle
?essedan	to take
?āye vāye	wandered
?assom	slotted spoon
?ārme	longing of pregnant woman
?owrak	swing
?owzidan	to hang on
?āloy kerdan	to show
?oštolom	cruelty
?atkali	carelessly

Now, let us determine which constraints are responsible for ?-elision in SHDP and how they are ranked in our developing hierarchy. In order to account for ?-elision in word-final position, word-internal codas and clusters, as well as retention of the glottal stop in word-initial position, it is required to see how the following constraint is ranked in the grammar of SHDP:

(12) **PRES (cons glottis) /#__**

Preserve [+ cons glottis] segments in word-initial position

According to Davenport (1998), when /?/ is articulated, the glottis is constricted so this sound bears the feature [+ cons glottis]. Thus, the above con-

straint must dominate HAVE-PLACE to prevent ?-elision in word-initial position. In order to account for CL, the constraint POSCORR must be ranked above DEP-μ. Therefore, we come to the following constraint ranking:

PRES (cons glottis) #__ >> HAVE-PLACE >> POSCORR >> DEP-μ

The following tableaus present an OT account of ?-deletion in different phonological positions in SHDP. Tableau (24) illustrates an example of glottal stop deletion in word-final position.

Tableau (11)

sari? → sari:

/s¹μa²μr¹μi²μμ?³μ/ ‘fast’	PRES (cons glottis) #__	H A V E - PLACE	POSCORR	DEP-μ
→a.[s¹μa²μr¹μi²μμμ]				*
b.[s¹μa²μr¹μi²μμ]			*!	
c.[s¹μa²μr¹μi²μμ?³μ]		*!		

The OT account of ?-elision in word-internal coda position may be made in the following optimal theoretic tableau in which candidate (a) wins since it does not violate any high-ranked constraint.

Tableau (12)

sa?di → sa:di

/s¹μa²μ?³μd¹μi²μμ/ ‘name of a Poet’	PRES (cons glottis) #__	H A V E - PLACE	POSCORR	DEP-μ
→a.[s¹μa²μμd¹μi²μμ]				*
b.[s¹μa²μd¹μi²μ]			*!	
c.[s¹μa²μ?³μd¹μi²μμ]		*!		

The following tableau accounts for glottal stop elision in consonant clusters.

Tableau (13)

šam?→ ša:m

/š¹μa²μ m³μ?μ/ ‘candle’	PRES (cons glottis) #__	HAVE-PLACE	POSCORR	DEP-μ
→ a.[š¹μa²μμ m³μ]				*
b.[š¹μa²μ m³μ]			*!	
c.[š¹μa²μ m³μ ?μ]		*!		

In order to take account of intervocalic ?-elision it is required to determine the relative ranking of the constraint *VV in the hierarchy. As mentioned before, dominance of *VV over HAVE-PLACE does not affect the selection of the optimal candidate neither does it affect the dominance of HAVE-PLACE over *VV. Thus, the following ranking is proposed:

PRES(cons glottis)/#__ >> HAVE-PLACE, *VV >> POSCORR >> DEP-μ

Tableau (14)

motāle?e → motāle:

/m¹μo²μ t¹μā²μμ l¹μe²μ?¹μe²μ/ ‘studying’	PRES (cons glottis) #__	HAVE-PLACE	*VV	POSCORR	DEP -μ
→ a.[m¹μo²μt¹μā²μμl¹μe²μμ]				*	*
b.[m¹μo²μ t¹μā²μμ l¹μe²μ]				**!	
c.[m¹μo²μ t¹μā²μμ l¹μe²μ?¹μe²μ]		*!			
d.[m¹μo²μ t¹μā²μμ l¹μe²μe²μ]			*!	*	

The following tableau accounts for the fact that /?/ is retained in word-initial position.

Tableau (15): Retention of /?/ in word-initial position

?al → ?al

/?¹μa²μl³μ/ ‘ridiculous’	PRES(cons glottis) #__	HAVE-PLACE	POSCORR	DEP-μ
→ a.[?¹μa²μl³μ]		*		
b.[a²μμl³μ]	*!			*
c.[a²μl³μ]	*!		*	

4.3.2 Paradigmatic effects on ?-deletion

Nouns, adjectives and verbs structurally related to ?-bearing bases, follow their base in respect of lenition. If ?-elision is blocked in the base, so it is in the related form, but if the base undergoes lenition the related form also does. As mentioned before, this outcome is due to the existence of a MAX-OO constraint. Thus, the following OO-faithfulness constraint must be top ranked in our developing hierarchy:

(13) **MAX-OO (+ cons glottis)**

Every [+cons glottis] specification in a base form is present in related forms

Having defined the constraint which forces unity in the paradigm, let us consider the following examples:

Table (11): Paradigmatic effects on ?-elision

This observation can be transcribed in OT terms as is shown in Tableau (29).

Tableau (16)

i./d¹μa²μ?³μv¹μa²μt³μ/ ‘invitation’	MAX-OO (+cons glottis)	PRES (cons glottis) /#__	HAVE-PLACE	POS CORR	DEP -μ
→ a.[d¹μa²μμ v¹μa²μt³μ]					*
b.[d¹μa²μv¹μa²μt³μ]				*!	
c.[d¹μa²μ?³μv¹μa²μt³μ]			*!		
ii. da?vat + i ii. / d¹μa²μ?³μv¹μa²μt¹μ i²μμ/					
→ a.[d¹μa²μμv¹μa²μt¹μ i²μμ]					*
b.[d¹μa²μv¹μa²μt¹μ i²μμ]				*!	
c.[d¹μa²μ?³μv¹μa²μt¹μ i²μμ]	*!		*		

Tableau (30) demonstrates that when lenition is blocked in the base it is also blocked in the forms structurally related to the base.

Tableau (17)

i./?¹μā²μμr³μm¹μe²μ/ ‘longing of the pregnant woman’	MAX-OO (+cons glottis)	PRES (cons glottis) /#__	HAVE-PLACE	POS CORR	DEP -μ
→ a.[?¹μā²μμr³μm¹μe²μ]			*		
b.[ā²μμr³μm¹μe²μ]		*!		*	
c.[ā²μμμ r³μm¹μe²μ]		*!			*
ii. ?ārme+ dār + i ii./?¹μā²μμr³m¹μe²μd¹μā²μμr¹μi²μμ/					
→ a.[?¹μā²μμr³m¹μe²μd¹μā²μμr¹μi²μμ]					
b.[ā²μμμ r³m¹μe²μd¹μā²μμr¹μi²μμ]	*!	*			*
c.[ā²μμr³m¹μe²μd¹μā²μμr¹μi²μμ]	*!	*		*	

7. Conclusion

In this study, elision of laryngeals (h, ?) in Shirazi dialect of Persian (SHDP) was examined within the framework of OT. Based on the observations these processes are restricted to the syllabic position. In general, elision is blocked in word-initial position in SHDP but it may be triggered in coda position (word--finally or word-internally), intervocalic position and in some cases it is also applied to consonants positioned in the onset of the stressed syllables although usually lenition is blocked in the onset. Thus, SHDP can be categorized in the list of languages which may allow lenition in the onset of the syllable. Paradigmatic effects are responsible for blocking the lenition processes in grammatically related forms of a base (nouns, adjective, verbs) when the base resists the process. This patterning is due to the existence of an output-output faithfulness constraint in the grammar of SHDP. Based on the data, we came to the following conclusion: the process of laryngeal elision in SHDP is followed by compensatory lengthening (CL). It is suggested that no CL occurs after the deletion from the onset of the syllable since onset is non-moraic (Hayes 1989, Kambusia & Alavi 2004). But data revealed that CL occurs after h-deletion from the onset of the stressed syllables in SHDP. This supports the claim made by Kambuzia (2000, cited in Kambuzia & Alavi 2004) that onset is moraic in Persian. Furthermore, the current study shows that contrary to SP in which CL is applicable only when /h/ is deleted between a vowel and a consonant (Mahootian 1997), in SHDP, word-internal h-deletion in all typologically weak environments is always followed by CL which can be meaning distinctive.

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References:

Abolghasemi, M. 1999. *Dastur-e tarikhi-ye zaban-e Farsi* (*A historical grammar of the Persian language*). Tehran: Sazmane motale va tadvin-e kotob-e olum-e ensani (SAMT).

Bagheri, M. 1994. *Tarihk-e zaban-e Farsi* (*The history of Persian*). Tehran: Ghatre Press.

Bakovic, E. J. 1994. Strong onsets and Spanish Fortition. *MIT Working Papers in Linguistics*. Revised: March 1995. ROA 96–0096.

Bateni, M. R. 1969. *Tosif-e sakhteman-e dasturi-ye zaban-e Farsi* (*Analysis of Persian grammar*). Tehran: Amirkabir University Press.

Bijankhan, M. 2005. *Vajshenasi nazariye-ye behinegi* (*Phonology Optimality theory*). Tehran: Sazmane motale va tadvin-e kotob-e olum-e ensani (SAMT).

Carr, P. 1993. *Phonology*. London: Macmillan Press LTD.

Davenport, M.; S. J. Hannas 1998. *Introducing Phonetics and Phonology*. Oxford University Press Inc.

Haghshenas, A. M. 1999. *Avashenasi* (*Phonetics*). Tehran: Agah Press.

Hayes, B. 1989. Compensatory Lengthening in Moraic Phonology. *Linguistic Inquiry*, 20, 253–306. (Retrieved October 20, 2007, from http://www.linguistics.ucla. Edu/people/hayes/).

Honeybone, P. 2006. *Lenition*, *weakening and consonantal strength*: *tracing concepts through the history of phonology*. (Retrieved July 28, 2007, from http://www.englang.ed.ac.uk/people/lenithist.pdf).

Honeybone, P. 2001. Lenition inhibition in Liverpool English. *English Language and Linguistics*, 5/2, 213–249. (Retrieved May 13, 2007, from http://www.journals.cambridge.org).

Kambuzia, A.; F. Alavi 2004. *Vajshenasy-ye morai va sakhte heja dar zaban-e Farsi* (*Moraic phonology and syllable structure in Persian*). Tehran: The eighth linguistic conference in Iran.

Keer, E. W. 1999. *Geminates*, *the OCP and the nature of CON*. Doctoral Dissertation. Graduate School–New Brunswick, 74–81. ROA 350–1099.

Kirchner, R. 1998. *An effort based approach to consonant Lenition*. Doctoral Dissertation. University of California, Los Angeles (UCLA). ROA 276–0898.

Lavoie, L. M. 2001. *Consonant strength*: *Phonetic Patterns and Phonological Manifestations*. New York: Garland Publishing, Inc.

Mahootian, S. 1997. *Persian*. London: Routledge.

McCarthy, J. J. 2006. *Candidates and derivations in optimality theory*. University of Massachusetts Amherst. ROA 823–0506.

McCarthy, J. J. 2002. *A Thematic Guide to Optimality Theory*. New York: Cambridge University press. (Retrived July 28, 2007, from http://www.cambridge.org).

McCarthy, J. J.; A. S. Prince 1995. *Faithfulness and reduplicative identity*. ROA 60.

McCarthy, J. J.; A. S. Prince 2001. *Prosodic morphology*, *constraint interaction and satisfaction*. ROA 428–1201.

Meshkatoddini, M. 2000. *Dastur-e zaban-e Farsi bar paye-ye nazariye-ye gashtari* (*Introduction to Persian transformational syntax*). 2nd ed. Mashhad: Ferdowsi University Press.

Mustafawi, E. M. 2006. *An optimal theoretic approach to variable consonantal alternations in Qatari Arabic*. Doctoral dissertation. University of Ottawa, Canada. ROA 839–0606.

Najafi, A. 2001. *Mabani-ye zaban shenasi va karbord-e an dar zaban-e Farsi* = *Basics of linguitics and its application to Persian*. Tehran: Niloofar Press.

Prince, A; P. Smolensky (n. d). Optimality theory in Phonology. (Retrieved September 26, 2007, from http://www.personal.rdg.ac.uk).

Prince, A.; P. Smolensky 1993. ROA version (2002). *Optimality Theory*: *constraint interaction in generative grammar*. ROA 537–0802.

ROA = Rutgers Optimality Archive, http://roa.rutgers.edu

Samare, Y. 1999. *Avashenasi-ye zaban-e Farsi* (*Persian Phonetics*). 2nd ed. Tehran: Markaz-e nashr-e daneshgahi Press.

Topintzi, N. 2007. *A* (*not so*) *paradoxical instance of compensatory lengthening*: *Samothraki Greek and theoretical implications*. University College London, University of Patras and University of Thessaloniki. ROA 900–0207.

Yarmohammadi, L. 1995. *A contrastive phonological analysis of English and Persian*. Shiraz: Shiraz University Press.

Zuraw, K. 2003. Optimality theory in Linguistics. In: Michael Arbib, ed., *Handbook of Brain and Neural Networks*. 2nd ed. Cambridge, MA: MIT Press, 819–822. ROA 792–1205.

Elizija /h, ?/ u perzijskome Shirazi dijalektu (SHDP): analiza prema teoriji optimalnosti

Sažetak

Mnogi su se znanstvenici do danas bavili proučavanjem lenicije (oslabljivanja) kao jednog od najučestalijih fonoloških procesa. Elizija (ispuštanje) grkljanika (grkljanskog frikativa /h/ i grkljanskog prekidnika /?/) jedna je od najčešćih fonoloških alternacija u perzijskom Shirazi dijalektu (SHDP) koja je do danas, koliko je znanstvenicima poznato, neistražena. U radu se nastoje opisati činjenice o toj čestoj fonološkoj alternaciji u spomentom perzijskom regionalnom dijalektu te se naglašavaju osnovne razlike u nastupanju tih procesa u Shirazi dijalektu i standardnom perzijskom jeziku (SP). Analiza je rađena prema okviru optimalne teorije (Optimality theory) (McCarthy and Prince 1995., 2001.) prema kojoj su jezični oblici rezultat međudjelovanja prekršivih općih ograničenja. Istraživanjem se pokazalo da su spomenuti procesi brisanja suglasnika u Shirazi dijalektu ograničeni položajem u slogu te su uvjetovani položajem u kodi, između dvaju vokala ili u suglasničkom skupu. Uglavnom se ne ostvaruju u pristupu, iako postoje primjeri u kojima je gubljenje dopušteno i u pristupu naglašenog sloga. Stoga ovo istraživanje Shirazi dijalekt svrstava među jezike koji dopuštaju oslabljivanje u pristupu naglašenog sloga. Spomenuti procesi ispuštanja ne događaju se na početku riječi, a nakon ispuštanja grkljanika uvijek slijedi kompenzacijsko produljivanje (Compensatory lengthening – CL), čak i nakon ispuštanja u pristupu naglašenog sloga.

Key words: lenition or weakening, laryngeal elision, phonological processes, Optimality Theory

Ključne riječi: lenicija ili oslabljivanje suglasnika, elizija grkljanika, fonološki procesi, teorija optimalnosti