

# ON DISTINGUISHING PERSIAN VOWELS\*

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This paper addresses the controversy over the active feature of the Persian vowel system. The goals of this paper are as follows: (i) to evaluate the arguments presented in the literature for quality and quantity as the contrastive dimension in Persian; (ii) to show that to determine phonological contrasts, it is necessary to refer to phonological processes; (iii) to propose that such a determining process exists in the phonology of Persian, and supports the qualitative, or featural, analysis of the contrast.

## 1. Introduction

It is widely believed that the Middle Persian vowel system, given in (1), was quantitative (e.g., Salemann 1930, Rastergueva 1969, Windfuhr 1979).

- (1)    i ī                    u ū  
         ē                    ō  
                              a ā

This system changed over time and one of its current dialects is Modern Persian. The Modern Persian vowel system is given in (2):

- (2)    i                    u  
         e                    o  
         a                    a

Contrasts in the Modern Persian vowel system are widely believed to be qualitative, with quantity playing a secondary, non-contrastive role (e.g., Samareh 1977, Najafi 2001). This means that the system has changed from quantitative to qualitative from Middle Persian.

Despite this widespread idea, there are studies which consider quantity to be active in the modern system (Windfuhr 1979, Hayes 1979). So, in this view, the system is still quantitative underlyingly.

A synthetic analysis which includes both quality and quantity is also suggested in the literature. In this view, the system is considered to be in a transition state from the quantitative system of classical Persian to the qualitative system of future Persian (Toosarvandani 2004).

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This paper focuses on the synchronic status of the Modern Persian vowel system. The questions that it addresses are as follows: (i) What evidence are these claims about the active feature of the Modern Persian vowel system based on?; (ii) What do synchronic phonological processes of the language have to say about this issue?

I reexamine the evidence in the literature for quality and quantity, and show that it is inconclusive. I suggest that an active phonological process of Persian, vowel harmony, plays a decisive role, providing strong evidence for quality.

## 2. Theoretical Foundations

The framework within which I present my analysis is Modified Contrastive Specification (e.g., Avery and Rice 1989, Rice and Avery 1993, Dresher, Piggott, and Rice 1994). In this view, phonology is rooted in contrast and features appear in a system to show these contrasts. Contrastive specification is the result of ordering features into a contrastive hierarchy (see, e.g., Dresher 2003a, 2003b, 2003c). Two languages with the same surface inventory can have different underlying representations because contrasts may be built up differently in the two systems. In order to find out the contrasts in a system, one should look at the phonological processes of the language under study.

Within this framework, given the nature of the Modern Persian vowel system, it is not expected to need both quality and quantity to be active in the system. Assuming that features enter into a system to show contrasts, in this system if we distinguish the vowels by quality, we do not need quantity and if they are distinguished by quantity, there is no need for quality to be phonologically active. Therefore, either quality or quantity is the active feature in the Persian vowel system. Let us first look at quality.

## 3. Quality

In the view according to which quality is the active feature, the system is underlyingly as follows:

- (3)    i            u  
       e            o  
       a            ɑ

Let us now see what evidence is presented in the literature for this position. This section includes discussions on phonetic measurements and stress.

### 3.1 Phonetics of Vowels

A number of studies argue for quality in the system based on acoustic measurements (e.g., Sokolova et al 1952 to which Windfuhr 1979 refers; Gaprindašvili and Giunašvili 1964 to which Kramsky 1966 refers).



Also it is suggested that former short and long vowels both are long before a consonant and very long before a consonant cluster. For example, in the three words in (9a), the vowel *u* is longer in *gu.ft* than it is in *gu* and it is the longest in *gu:ft*. The same happens in the three words in (9b). The vowel *a* is longer in the second word than in the first word and even longer in the third word (the same reference).

- (9) a. **gu, gu.ʃ, gu:ʃt** ‘the present stem of *goftan* ‘to tell’, ear, meat’  
 b. **na, na.r, na:rm** ‘no, male, soft’

If length distributions are purely contextual and predictable, then it might argue that length is not a phonological property. But again we need to carry out a systematic study of vowels and consonants and consonant clusters to understand the conditions under which the lengthening occurs.

I conclude that these phonetic measurements are not conclusive in arguing for quality being phonologically active in the system. Next we look at stress which is another argument presented in the literature for quality.

### 3.2 Stress

Stress, which is accounted for in Persian without referring to vowel quantity, is another criterion to which some literature refers in favor of quality (for stress in Persian see, e.g., Amini 1997, Kahnemuyipour 2003). For example, it is mentioned that “in a stressed position, which is particularly reliable in the matter of quantity, the length of all vowels is more or less identical and comparatively small” (Pisowicz 1985, p.12).

It is true that a frequent diagnostic for syllable weight is stress (e.g., Allen 1973). The fact that stress in a language does not refer to quantity, however, cannot be an argument for quality since there are quantitative languages whose stress systems do not refer to quantity (see Hayes 1995 for examples).

We saw that phonetic measurements and stress do not provide us with conclusive evidence for quality in the system. Next we look at quantity.

### 4. Quantity

In the view according to which quantity is the active feature, the system is underlyingly as follows:

- (10)    i    ī            u    ū  
           [e]                    [o]  
                                  a    ā

Let us now look at the arguments presented in the literature for quantity. This section includes discussions on versification and categorization of vowels.

#### 4.1 Versification

Based on assigning metric positions, some literature consider *i, u, a* to be long and *e, o, a* to be short (e.g., Hayes 1979, Mahyar 1994). The evidence based on versification is not, however, conclusive due to the nature of Persian versification which we look at below. The question is that if Modern Persian is not a quantity-based system, why is a quantitative system used for its poetry?

It can be argued that the Modern Persian versification is a continuation of the Middle Persian versification which is expected to be quantitative since the system was quantitative. But it is claimed that Middle Persian poetry is not based on quantity (see Natel Khanlari 1966 for references).

This is important to note for two reasons: (i) Modern Persian versification is not a continuation of Middle Persian versification; (ii) Middle Persian versification does not show quantity, as is argued, to be the active feature in its vowel system.

Middle Persian poetry is based on the number of syllables and not on quantity according to the literature. What is also important to note is that folk poems of the present time in some parts of Iran still follow the same versification; that is, they are not based on quantity but rather on the number of syllables (see Natel Khanlari 1966 for references). There is also an account which considers stress to be the main factor in Middle Persian poetry (see the same reference). What is important for our discussion is that all of these accounts agree that quantity was not the main element in versification of Middle Persian.

The Persian versification rules are from Arabic and so they are quantity based. Iranians, who realized problems in following Arabic meters, adjusted the syllabic principles to quantitative Arabic meters (Natel Khanlari 1966).<sup>1</sup>

If we argue for quantity in the modern system based on versification, then since in Middle Persian quantity was not used for versification, can we conclude that the Middle Persian system was not quantitative?

If we cannot consider versification as an argument for quantity, then one of the strongest evidence in the literature for quantity in Modern Persian is not valid anymore.

#### 4.2 Categorization of Vowels

A classification of *a, e, o* versus *a, i, u* is observed in the literature. In those works in favor of quantity, it is mentioned that unifying *e, o, a* versus *i, u, a* in qualitative terms would be very complex, because there is no single or even a pair of features that can account for this distinction (Windfuhr 1979). The classification of *a, e, o* versus *a, i, u* is sometimes even observed in the literature which argue for quality, as follows.

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<sup>1</sup> See Hanson and Kiparsky (1996) for a discussion on how Finnish metrics shows the interplay of linguistic and cultural pressures, and how borrowed Germanic meters were modified in Finnish.

Phonotactic constraints, in some cases, require a categorization of /a, e, o/ versus /ɑ, i, u/. It is mentioned that there are two functionally different groups of vowels based on consonants that can follow them: /a, e, o/ and /ɑ, i, u/. /a, e, o/ can occur before all consonant clusters as far as the first member is concerned (with some exception); /ɑ, i, u/ cannot occur before clusters whose first consonant is /g, ʔ, dʒ, z, h, m/, etc. (see Samareh 1977).

In another study, the vowels are categorized as “stable” and “unstable” rather than “long” and “short”. *a, i, u* are called “stable” vowels as they have a relatively constant duration and are not subject to change in quality<sup>2</sup> as opposed to *a, e, o*, which are called “unstable” vowels with variable duration and changes in quality (Lazard 1992).

It is apparent that some categorization between the historical short vowels (present *a, e, o*) and the historical long vowels (present *a, i, u*) is still assumed in much of the literature on Persian vowels. I used “some” because there is no single interpretation of their status in the literature as we saw.

We looked at arguments in the literature for quality and quantity. I argued that these arguments are not convincing. Now we discuss a phonological process of the language which argues for a featural account of the contrast.

## 5. Vowel Harmony

Quality as the phonologically active feature in Modern Persian is strongly supported by raising harmony in the language. Persian shows several patterns of vowel harmony in which a mid vowel is raised to a high vowel.

Examples of within-stem height harmony are presented below. As we see, /o/ and /e/ are raised to /u/ and /i/, respectively.

- (11) o → u / — Cu
- |    |       |   |       |            |
|----|-------|---|-------|------------|
| a. | sogut | → | sugut | ‘falling’  |
| b. | hozur | → | huzur | ‘presence’ |
- (12) e → i / — Ci
- |    |       |   |       |            |
|----|-------|---|-------|------------|
| a. | kelid | → | kilid | ‘key’      |
| b. | sebil | → | sibil | ‘mustache’ |

Evidence for the underlying presence of /o/ and /e/ (and not of /u/ and /i/) in the above forms is as follows: first, the existence of words with CuCu and CiCi in the language argues for /o/ and /e/ in the above examples. These words, some of which are given below, are never pronounced as CoCu and CeCi even in very formal speech. In their written forms they have the letters used for [i] and [u] which are pronounced in both formal and colloquial speech.

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<sup>2</sup> The exception is *a* before nasal consonants. Note that in Persian, the vowel *a* is raised to *u* before nasal consonants; for example, *badam* ‘almond’ is pronounced as *badum*, and *xane* ‘house’ as *xune*.

- (13) CuCu Words  
 a. susu ‘glimmer’  
 b. lulu ‘bogy’

- (14) CiCi Words  
 a. sili ‘slap’  
 b. bini ‘nose’

Second, the orthography of the language supports the presence of /o/ and /e/ in forms such as those in (11) and (12). In Persian /a/, /e/, and /o/ are represented by diacritics (which are not inserted in writing except in books for new-learners), and /a/, /i/, and /u/ by three letters of the alphabet. None of the words in (11) and (12) contain the symbols used for /i/ and /u/ for their first vowel in their written form. It is only in speech that [i] and [u] are pronounced. In (13) and (14), on the other hand, the vowels are both represented by the vowel symbols.

Similar patterns of raising are also observed in prefix-stem in imperatives and in loanwords.

The vowel in the imperative marker *be-* may assimilate to the vowel *i* or *u* of the root.<sup>3</sup> Note that this process seems to be greatly under the influence of sociolinguistic factors.

- (15)  $e_{\text{prefix}} \dots i_{\text{stem}}/u_{\text{stem}} \rightarrow e_{\text{prefix}} \sim i_{\text{prefix}}/o_{\text{prefix}} \sim u_{\text{prefix}}$   
 a. *be + gir* → *begir ~ bigir* ‘take!’  
 b. *be + xun*<sup>4</sup> → *bexun ~ boxun/buxun*<sup>5</sup> ‘read!’

In loanwords, an epenthetic /e/ is inserted to break up the initial consonant clusters. The /e/ may be realized as *e* or *i* when the cluster is followed by *i* (see Rohany Rahbar, to appear, for discussion).

- (16)  $e_{\text{epenthetic}} \dots i \rightarrow e_{\text{epenthetic}}/i_{\text{epenthetic}}$   
 a. *freezer* → *ferizer ~ firizer*  
 b. *grease* → *geris ~ giris*

Assuming that harmony is feature based (e.g., see van der Hulst and van de Weijer 1995, van Oostendorp 1995), if quality is considered as the basis for contrast in the Modern Persian vowel system, these changes are easy to account for.

If, however, quantity is taken to be the active feature in the system, these cases of harmony are much more difficult to explain since quantity, occupying

<sup>3</sup> I leave aside the assimilation of *e* to *o* of the root in imperatives which is a very common process (e.g., *be + ro* becomes *boro* ‘go!’).

<sup>4</sup> *xan* is pronounced as *xun* in speech due to raising before nasals.

<sup>5</sup> In this case, place assimilation also occurs.

two positions, is not a feature and cannot spread (see van Oostendorp 1995 for a discussion on this for Dutch).

Now let us look at harmony in low vowels. There is some interaction between the two low vowels in Persian, in the following way:

- (17)  $a \rightarrow \alpha / C - \text{?}, \text{ha}$
- |            |   |                 |              |
|------------|---|-----------------|--------------|
| a. bahar   | → | <b>b</b> ahar   | ‘spring’     |
| b. dʒahan  | → | <b>dʒ</b> ahan  | ‘world’      |
| c. maʔaʃ   | → | <b>m</b> aʔaʃ   | ‘livelihood’ |
| d. saʔadat | → | <b>s</b> aʔadat | ‘happiness’  |

This could be a case of laryngeal transparency. The process involves only low vowels. It also involves only laryngeal consonants; it does not occur across other consonants (e.g., *tabar* does not become *tabar* ‘lineage’; *tanab* does not become *tanab* ‘rope’). One possible account is that laryngeals and low vowels both have the feature [low], and assimilation is possible in this environment. Whether Persian laryngeals bear the feature [low] or not remains to be investigated. The point relevant to our discussion about this process is the occurrence of harmony.

We assumed that harmony is feature based. Therefore between height and length, the harmony pattern in non-low vowels argues for height. Recall the underlying representation of the inventory under the view that height is active in the system:

- (18)
- |   |   |
|---|---|
| i | u |
| e | o |
| a | α |

The feature [high] spreads from a high vowel to a mid vowel considering height being active in the system. And in the harmony pattern in non-low vowels we can suggest place assimilation and so the feature involved is a place feature which spreads from *α* to *a*.

But let us consider the patterns of harmony in low vowels and non-low vowels together. We see that the targets of harmony in these harmony patterns are the former short vowels and the triggers are the former long vowels so a categorization of *a, e, o* versus *α, i, u* based on the patterning of these vowels in a phonological process such as harmony can be observed.

- (19)
- |                |   |                 |
|----------------|---|-----------------|
| <u>targets</u> |   | <u>triggers</u> |
| a              | → | α               |
| o              | → | u               |
| e              | → | i               |

This brings up a question as follows: can we suggest a feature (e.g., tense or [+ATR]) to be active in the system and to be involved in these harmony processes such that both the harmony pattern in non-low vowels and the one in low vowels can receive a uniform account and therefore the categorization



observed above can be retained? That is, is it possible to represent the system as shown below in (20)? Under this scenario, the active feature of the system is [tense] and this is the feature which is involved in the harmony processes discussed above. The feature [tense] spreads from *a*, *i*, *u* to *a*, *e*, *o* in those harmony cases.

(20)	[tense]	i	u	[lax]	e	o
		a		a		

Whether we can take [tense] to be the active feature of the Persian vowel system remains as a topic for further investigation.

## 6. Conclusion

This paper reexamined the arguments presented in the literature for quality (i.e., phonetic measurements and stress) and those for quantity (i.e., versification and categorization of vowels) as the active feature in the vowel system of Modern Persian. It was shown that much of the evidence used in the literature is inconclusive. Following the view that for recognizing the contrasts in a system, we should look at the phonological processes of the language under study, I suggested that a phonological process in the language, vowel harmony, supports a featural analysis of the contrast in the system.

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