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Persian 'word stress' is a syntax-driven tone

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Abstract

Prominence in Persian words is generally referred to as 'word stress'. An important aspect in which the notion of Persian 'word stress' is flawed is that the location of 'stressed' syllables is entirely governed by syntax. That is, neither is it the case that 'stressed' syllables are in any way determined in the lexicon, nor is it the case that they are determined in the phonology, whether lexical or post-lexical, Persian 'stress' functions in syntax much as would a segmentally encoded particle.

Index Terms: word stress, accent, tone, syntactic tone, quotation, Persian

1. Word prominence in Persian

Prominence in Persian words has widely been described as morphologically predictable 'word stress' [1][2]. Nouns and adjectives, whether simple, derived or compound, are 'stressed' on the final syllable without exception (cf. 1a–c). Unprefixed verbs have 'stress' on the final syllable of the stem (cf. 1d), while prefixed verbs are 'stressed' on the leftmost prefix (cf. 1e). Nouns, adjectives and verbs may be syllabified with various clitics at phrase/clause level but this has no effect on the position of 'stress' (cf. 1f,g). It has also been noted that a few grammatical words, such as various conjunctions, are stressed on the initial syllable (cf. 1h). In the examples, suffix boundaries and clitic boundaries are shown by - and = respectively, while components of a compound are separated by +. Prominent syllables are marked with an acute over vowels.

(1)	a.	arús	'bride'
	b.	arus-ák bride-DER	'doll'
	c.	arusak+sə́z doll+make	'doll-maker'
	d.	busíd-am kissed-1SG	'I kissed'
	e.	mí-busid-am DUR-kissed-1SG	'I would kiss'
	f.	arús=am bride=1SG	'my bride'
	g.	né-mi-busid-am=et NEG-DUR-kissed-1SG=2SG	'I wouldn't kiss you'
	h.	váli	'but'

The position of 'stress' has been generally recognized as highly contrastive in Persian, mainly due to the homophony between derivational suffixes and clitics [1]. An example of a minimal pair is given in (2).

(2)		xub-í good-DER	xúb=i good=2SG
		'goodness'	'you are good'

Differently from all previous accounts of Persian prosody, we argue that what has been described as 'word stress' is exclusively governed by the syntax and is assigned independently of any form of prosodic phrasing. The syntactic motivation behind the location of 'stress' is in line with the recent experimental finding that the syllabic prominence at issue is created only by f0 features [3]. As carefully shown in [3], the durational and spectral differences between prominent and non-prominent vowels stay well below the baseline for a phonological status of stress. Phonologically, the Persian syllabic prominence consists of a H tone, and from a distributional perspective it is an accent [3][4].

2. Accent assignment is syntactically governed

Here we present evidence which suggests that accent is assigned on the basis of the syntactic label independently of the segmental morphemes to which it may link. In this respect, we will focus on the accentual behaviour of nouns. As will be seen, the final accent that is traditionally ascribed to nouns (cf. 1a–c) is not confined to the lexical class noun but is applied to any expression (including phrases, clauses, etc.) that is made to syntactically function as a single noun, e.g., for discourse purposes. Two types of such expressions will be discussed: pure quotations in Section 2.1 and naming expressions in Section 2.2. The assignment of accent on isolated words is reconsidered in Section 2.3, whereas Section 2.4 will show that the distribution of accent is independent of the prosodic phrasing in the language.

2.1. Pure quotations

When linguistic expressions are quoted and incorporated as a nominal argument into a new sentence structure, they are assigned only one accent on the final syllable irrespective of their default accent pattern. This happens, for instance, in the context of pure quotations [5], where a speaker mentions a linguistic expression to describe some aspects of language related to it. This phenomenon has received little attention in recent works on Persian prosody, although the facts were carefully documented by the traditional Persian prosodists such as [6]. To illustrate, any quoted expression embedded as X in the carrier sentence [X fɒrsi=e] 'X is Persian' is assigned only one accent which falls on its final syllable, as given in (3). As can be seen, all word forms in (1), regardless of their default accent location as shown in (1), have final accent when used as a quotation. For clarification, quoted expressions are given in square brackets.

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(3) a. [arús] fɒrsí=e.
"arus" is Persian.

b. [arus-ák] fɒrsí=e.
"arusak" is Persian.

c. [arusak+ sʊ́z] fɒrsí=e.
"arusaksʊz" is Persian.

d. [busid-ám] fɒrsí=e.
"busidam" is Persian.

e. [mi-busid-ám] fɒrsí=e.
"mibusidam" is Persian.

f. [arus=ám] fɒrsí=e.
"arusam" is Persian.

g. [ne-mi-busid-am=ét] fɒrsí=e.
"nemibusidamet" is Persian.

h. [valí] fɒrsí=e.
"vali" is Persian.

As an example, the f0 contours of the verb in (1d) and its corresponding quotation in (3d) are shown in Figure 1 and Figure 2, respectively, along with the relevant f0 measurements.

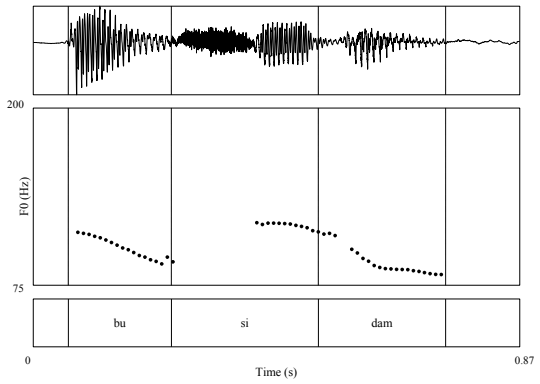

Figure 1: *F0 contour, plotted below the associated waveform, for the verb [busídam] 'I kissed' in its default accentuation, spoken by a male speaker. Mean f0 value of the first, second and third syllable is 97Hz, 117Hz and 86Hz respectively.*

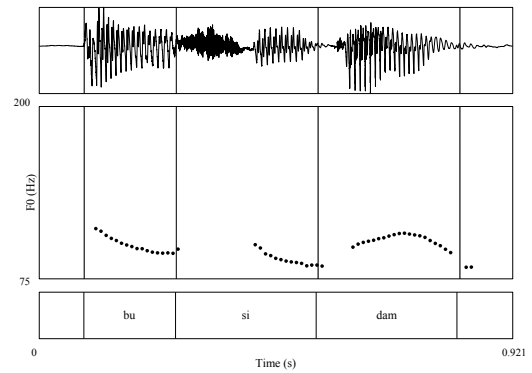

Figure 2: *F0 contour, plotted below the associated waveform, for the verb [busidám] 'I kissed' in its quotation accentuation, spoken by a male speaker. Mean f0 value of the first, second and third syllable is 95Hz, 87Hz and 107Hz respectively.*

The accentual behaviour of quotations is unaffected by the complexity and length of the quoted expression. Thus, a full clause used as a quotation takes one final accent irrespective of the number and location of accents in its default pronunciation. To illustrate, compare the default accentuation of the clause in (4a) with the accentuation in (4b) where the same clausal form is used as a quotation.

(4) a. [ín níz bó-gzar-ad]$_{\text{SENTENTIAL}}$
This too SUB-pass-3SG
'This too shall pass.'

b. [in niz bo-gzar-ád]$_{\text{QUOTATIVE/NOMINAL}}$
"this too shall pass"

The noun nature of these quoted expressions is further supported by the observation that they accept the noun morphology and can be modified by determiners and attributes in a similar fashion to nouns. Similar observations have been made for pure quotations in a number of European languages [5][7]. Thus, as shown in (5a), the inflected verb [busid-am] when quoted and used as an object argument is marked by the object marker clitic [=o] in a similar fashion to all nouns of the language. Similarly in (5b), the quoted expression appears as the head of a possessive nominal phrase, hence marked by the *Ezafe* clitic [=e], which links a nominal head to its post-modifiers.

(5) a. [busid-ám]=o góft-am.
kissed-1SG=OM meant-1SG
'I meant "busidam".'

b. [busid-ám]=e mán
kissed-1SG=EZ 1SG
'my "busidam"'

The use of pure quotations as nominal arguments is widespread in conversational language, for example, in the form of repetition of an utterance made by another speaker. An example is given in (6), which is reproduced from Hodge [8], who reported this as a puzzling case of 'stress shift' in inflected verbs. While the inflected verb plays its prototypical role as a matrix predicate in the utterance of Speaker A, hence the accent on the first prefix, it realizes with final accent when quoted by Speaker B and used as the subject argument of a wh-question.

(6) Speaker A: [né-mi-dun-am]$_{\text{PREDICATIVE/SENTENTIAL}}$
NEG-DUR-know-1SG
'I don't know.'

Speaker B: [ne-mi-dun-ám]$_{\text{QUOTATIVE}}$ ʧí=e?
NEG-DUR-know-1SG what=3SG
'What do you mean by "I don't know"?'

It is here worth noting that within quotation contexts, members of any accentual minimal pair become homophonous. Thus, the accentual contrast between the derived noun [xub-í] and the cliticized adjective [xúb=i] described earlier in (2) is neutralized in the context of quotation as shown in (7).

(7) a. [xub-í] fɒrsí=e.
"xub-i" is Persian.

b. [xub=í] fɒrsí=e.
"xub=i" is Persian.

2.2. Naming expressions

An important case of clausal forms that serve as nouns in syntactic constructions involves naming expressions that are used as nicknames or titles of works. These naming expressions, which are creatively and spontaneously formed in everyday usage, are accented on the final syllable similar to nouns. (8a) illustrates a naming expression in the form of a clause as the object argument of the sentence, hence marked by the specific object marker [=o]. Compare the accentuation of the bracketed naming expression with (8b), where the same form functions as an independent sentence.

(8) a. [bɒd mɒ=rɒ xɒhad bórd]=o díd-am
wind 1PL=OM FUT.3SG take=OM saw-1SG
'I watched *The wind will carry us*.'

b. bɒ́d mɒ́=rɒ xɒhád bord
wind 1PL=OM FUT.3SG take
'The wind will carry us.'

The corresponding f0 contours for the naming expression in (8a) and its sentential counterpart in (8b) are given in Figure 3 and Figure 4, respectively. Note that in Persian all accents at the phrase or clause level are phonologically equal [4]. In addition to the syntactically driven accent H, there are two boundary tones in the language: L% for declaratives and Wh-questions, and H% for yes/no questions.

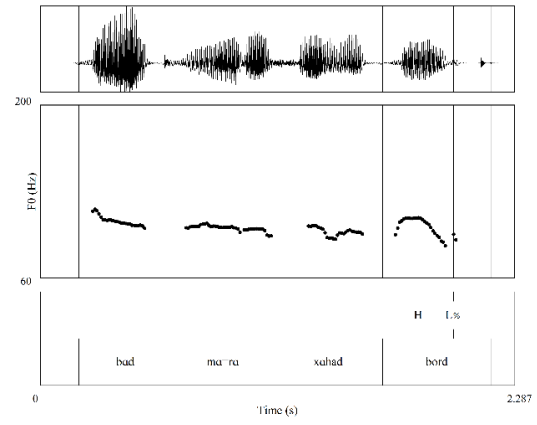

Figure 3: *F0 contour, plotted below the associated waveform, for the proper name reading of 'The wind will carry us'*

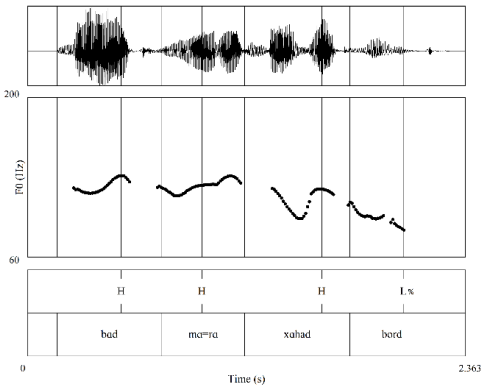

Figure 4: *F0 contour, plotted below the associated waveform, for the sentential reading of 'The wind will carry us'*

2.3. Accentuation of isolated words

From what has so far been described it should be clear that the (default) realization of accent, even on isolated words such as those given in (1), involves consideration of grammatical function / label. This point has generally been neglected in the standard descriptions of Persian prosody. First, all items with a non-final accent, i.e. verbs, cliticized forms and conjunctions, take a final accent if they serve as single nouns as described earlier. Thus, for example, the initial accent on conjunctions like [vali] 'but' indicates their function as conjunction at the sentence level. This is illustrated by the sentential minimal pair in (9), where the initially accented [vali] is the conjunction of the sentence whereas the finally accented [vali] is interpreted as the subject argument.

(9) a. váli harferábt=ast.
but conjunction=3SG
'But it is a conjunction.'

b. valí harferábt=ast.
but conjunction=3SG
'"but" is a conjunction.'

Second, nouns, which by default take accent on their final syllable, may take initial accent if they perform functions other than their typical nominal function as arguments. A well-known case of initial accent on nouns is when they serve as vocatives [1][2]. This is illustrated in (10), where the initial accent on the noun in (10b) signals vocative function, as opposed to the default final accent on the noun in (10a) which indicates its typical argument function.

(10) a. arús b. árus
bride bride.VOC

2.4. Prosodic hierarchy is irrelevant to accent distribution

The Persian prosodic hierarchy includes the prosodic word (ω), prosodic phrase (φ) and intonational phrase (ι). ω is the domain of obligatory syllabification which roughly

corresponds to a simple/derived stem plus inflectional affixes and clitics. φ and ι may be characterized by different degrees of pause length and pre-boundary lengthening [4]. Importantly, the distribution of accent in Persian utterances is in no way correlated with the prosodic phrasing. This can be shown by the systematic accentual contrast between a sentential expression and its nominal counterpart. (11) illustrates some possible prosodic segmentation for the minimal pair described in (8). As can be seen, the distribution of accent in (11a) and (11b) is not sensitive to variations in prosodic structure.

(11) a. bɒd mɒ=rɒ xɒhad bórd
'*The wind will carry us*'
$(((bɒd)_ω\ (mɒ=rɒ)_ω)_φ\ ((xɒhad)_ω\ (bórd)_ω)_φ\ )_ι$
$(((bɒd)_ω)_φ\ ((mɒ=rɒ)_ω\ (xɒhad)_ω\ (bórd)_ω)_φ\ )_ι$

b. bɒ́d mɒ́=rɒ xɒhád bord.
'The wind will carry us.'
$(((bɒ́d)_ω\ (mɒ́=rɒ)_ω)_φ\ ((xɒhɒ́d)_ω\ (bord)_ω)_φ\ )_ι$
$(((bɒ́d)_ω)_φ\ ((mɒ́=rɒ)_ω\ (xɒhɒ́d)_ω\ (bord)_ω)_φ\ )_ι$

The irrelevance of prosodic constituency to the distribution of accent can be further supported by considering the prosodic behaviour of function words. The language has various function words such as adpositions and modal particles that, although bearing no accent like clitics, are capable of both left and right cliticization as well as of forming independent ωs. This variation in prosodic phrasing has no bearing on accent distribution as illustrated in (12). The preposition is in fact never accented, not even when it forms its own ω as shown in (12c).

(12) mán az alí geréft-am
I from Ali caught-1SG
'I caught it from Ali.'

a. $(mán)_ω$ $(azalí)_ω$ $(geréftam)_ω$
b. $(má.naz)_ω(alí)_ω$ $(geréftam)_ω$
c. $(mán)_ω$ $(az)_ω(alí)_ω(geréftam)_ω$

These observations in particular challenge the idea that accent is a constituency effect of ω, as is usually assumed in the prosodic approaches to Persian accent such as [9].

3. Conclusions

This paper has argued that prominence in Persian words, generally described as 'word stress', is manifested by a tone whose position is governed by the syntax. In particular, we have shown that the final accent that is traditionally ascribed to nouns is associated with the prototypical nominal function that nouns fulfil in syntactic constructions. This final accent is assigned independently of the segmental morphemes to which it links meaning that any phrasal or clausal expression that syntactically functions as a single noun follows the same accentual pattern.

The idea that word accent assignment is post-lexical in Persian is in agreement with the experimental finding that Persian listeners fail to recall accent contrasts in the *stress deafness* paradigm [10]. If this short-term recall task relies on the listener's ability to store word prosody in their lexicon, the absence of lexical prosodic annotations in Persian exactly predicts that result, in spite of the fact that the functional load of accent location is high in the language.

4. References

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Abbreviations
DER = derivational, DUR = durative, EZ = *Ezafe*, FUT = future, NEG = negation, OM = object marker, SUB = subjunctive, VOC = vocative