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PERSIAN STRESS ASSIGNMENT UNDER OPTIMALITY THEORY

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In some accounts of stress assignment in Persian, it has been demonstrated that primary word stress must fall on the last syllable in a word. The observation made by Ferguson (1957:125) is given as under:

"It is usually said that word stress in Persian is predominantly on the final syllable. This is certainly true if only the dictionary entry form of words is considered, such as nouns without inflectional endings, infinitives of verbs, etc. If inflected forms of nouns and verbs are included, however, the customary statement about the predominance of final stress is not at all true. In an ordinary conversational text over half of the words may have nonfinal stress".

Examples of the both types. i.e., stress-final and stress-initial words are given in (1) and (2) respectively.

(1)   Word-final stress in Persian.

/keta:b/   'book';   /raftæn/   'to go';

/baccchá: /   'children':   /dorostká:r/   'right-doer':

/`keša:vœrzi:/ 'agriculture'

(2)   Word-initial stress in Persian

/boro/   'go'   /hæma:n;   'that one'

/xéjli:/   'very, much'   /ká:ški:/   'I wish'

The second and the fourth examples in (1) show clearly that final vowels are typically visible to stress computation, yet there are some cases of invisibility, i.e., an assignment of 'extrametricality' (the word - ending syllable which is not counted in stress computation) which follows from a series of observations about the morphological affiliation of this vowel. First, it is observed that in majority of cases. the vowel-

ending words are made up of two morphological components: a 'derivational stem' and a 'terminal element' as is shown later in (3 (a) and (b)). In many such cases, stress lodges on the ultimate syllable, suggesting that stress applies at the level of the word rather than the derivational stem. This way, the terminal element remains visible to stress (as is shown later in (3a). It is argued that stress assignment is determined by a right - headed foot structure built from the right edge of the word. This argument is based on the position of the primary stress, i.e., the word - final position, in Persian words. It is, of course, noteworthy that some degree of stress is perceptible in Persian as some stressed syllables are apparently louder than others in the same utterance.[9] This point is, however, disregarded for the purposes of the present work, since it has no bearing on the position of word stress as defined below.

"A Persian word pronounced in isolation has one syllable of heavier stress than the others. When the word is used in a sentence, usually the same syllable is stressed or the word has no stressed syllable at all, rarely the stress is shifted, i.e., falls on a syllable other than the one stressed when the word is spoken alone. The syllable on which the stress falls when a given word is uttered in isolation is said to have 'inherent' or 'potential' stress, or simply t he WORD STRESS. (Ferguson 1957: 124)

The iambic foot (a metrical foot comprising an unstressed and a stressed syllable) is therefore the result of the right - headedness which shows the stress assignment in Persian. The existence of another type of stress, the one with word - initial stress forces the acceptability of the left - headed structure, i.e., trochaic foot (a metrical foot comprising a stressed and an unstressed syllable). The justification here would be that such structures either contain a morphological element, namely a verb prefix which is strong in stress assignment (e.g. be' 'imperative marker' in words like /bezan/ 'hit'   /begu:/ 'say', /bexa:n/ 'read', etc.) or belong to the list of borrowed words, mainly of Arabic origin (e.g. /?vvalan / 'firstly', /ma:ša:lla:h/ 'exclamation of wonder', /hatta:/ 'even', 'also', etc.

As mentioned earlier, terminal elements, in majority of cases, get involved in the foot patterning of the word. There are, in 'fact, suffixes which pull stress to the new final syllable (e.g. garm + i: → garmi: 'heat', su:rat + ha: → su:ratha: `faces'. ti:q + e → /tiqe/ 'edge', mard + `a:ne → marda:ne 'manly', etc.). In other cases, i.e. certain suffixes which fail to pull stress over, terminal elements are extrametrical (e.g. man + o → mano 'i and', cu:n + ke → cu:nke 'since', etc). In 3a and 3b stress computation is given for two words: /nadi:de/ 'unseen' and /nadi:de/ 's/he has not seen'. The word /nadi:de/ has unmarked stress, because its dominant foot is iambic (Cf. 3a). The word /nadi:de/, however, has marked stress, because its dominant foot is trochaic. (Cf.3)

(3)   The two types of stress patterns in Persian.

(a) na.di:de   (b) na.di:.de

* (* *) line 0   (*   *) <*> line 0

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9. See Hodge 1957:359 for the discussion on pitch and stress; pitch juncture patterns, where he distinguishes three main allophones, namely tertiary, secondary, and loud for the primary stress.

(*) line 1   (*)   line 1

  * line 2   *   line 2

The diagrams in 3 (a) and (b) are interpreted as follows:

In line 0 (the level of syllables) potential stress bearers (vowels) in each word are marked with asterisk. This rightmost vowel in (3b) is extrametrical, meaning thereby that it is not computed in the calculation of stress. This vowel is isolated in angled brackets.

Also in line 0, potential stress bearers are grouped into metrical constituents (feet). In Persian, dominant foot is the rightmost one. In unmarked foot formation (3a), the dominant foot is right-headed (iambic); this fact is shown by augmenting the right-hand element of the dominant foot in line 0 with an asterisk in line 1 (the word level). In marked foot formation (3b), the dominant foot is left-headed (trochaic); in this case the left head of the foot is therefore marked in line 1. Line 1 marks are augmented in line 2 (the end rule marking the word stress)[10].

In the above analysis, marked and unmarked stresses are accounted for parametrically. Extrametricality and foot - formation are shown for both / nadi:de / and / nadi:de/, yet the crucial difference lies in the headedness of the dominant foot (iambic or trochaic). Building upon what is already presented, it will be safe to claim that the rightmost element is typically identified as a potential stress bearer, no matter a terminal element or not. This would further lead us to conclude that the assignment of extrametricality is limited to vowels which are terminal elements.

In OT analysis, Persian foot formation and stress assignment can be accounted for by the ranking of constraints. The constraints used by Hammond (1997: 44), namely ROOTING, PARSE-SYLLABLE together with what is used by Rosenthall (1997), Morris (1998: 76), i.e., FOOTFORM, NONFINAL may be used to deal with word - stress in Persian. These constraints are explained as under.

ROOTING: Words must have one primary stress (the definition here is modified).

PARSE-SYLLABLE: Two unfooted syllables can not be adjacent.

FOOTFORM: Metrical feet are built upon moras with stress on the right syllable (the constraint is modified).

NONFINAL: feet are trochaic (left - headed) and the rightmost element is unfooted. The ranking of constraints for the word - final stress, here referred to as the unmarked stress (type one), and in the word-initial stress, referred to as the marked stress (type two) are given in (4) respectively.

(4)   Constraint - ranking for the unmarked and marked stress patterns in Persian.

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10. The level of syllable, the foot level, the word level and the end rule are the four levels distinguished by Liberman (1975). The level of syllable and the foot level are put together here to save space.

ROOTING » FOOTFORM » NONFINAL » PARSE-SYLLABLE

ROOTING » NONFINAL » FOOTFORM > PARSE - SYLLABLE

The tableaus below in (5) and (6) provide examples for each ranking. Either set of examples contains words with different number of syllables as to present the extent of applicability of the rankings in a broader view. Also, they will help picture out the structure of words having more than two syllables as far as word-stem and affixation are concerned, therefore, the boundary between the stems and the affixes is shown with '+' marker.

(5) Unmarked (word-final) stress pattern in Persian

a. /pesar/   'boy, son'

/ pe. sar/	ROOTING	FOOTFORM	NONFINAL	PARSE-SYLLABLE
a. e. sar.	*!			
b. (pe. sar.)		*!		
c. →(e. sar.)			*	

b. / pesarha: /   'boys, sons'

/ pe. sar+ha:/	ROOTING	FOOTFORM	NONFINAL	PARSE-SYLLABLE
a. pe. sar.ha:	*!			
b. (p e. sar.)ha:		*!		
c. → (e. sar.)ha:			*	
d. e. sar.ha:)		*!		
e. →pe.(sat-.ha:)			*	

As can be seen, the tableau (b) predicts two optimal candidates, i.e., (c) and (e), since both of them violate only the low - ranked NONFINAL constraint. To avoid this, there should be a constraint preventing (pe. sar) ha: from appearing on the surface level. The constraint ALIGN (Rosenthall 1997) is satisfying our need. This constraint requires that the right edge of the dominant foot coincides with

the right edge of the word. ALIGN is gradiently violable meaning that all things being equal, the optimal candidate is the one in which the dominant foot is closest to the right edge of the word. This constraint must be ranked above NONFINAL in the hierarchy presented in (4), therefore we have:

ROOTING » FOOFORM » ALIGN, NONFINAL » PARSE - SYLLBALE

In the marked stress patterning, however, this constraint is pushed down to a low-ranked position below NONFINAL and FOOTFORM.

ROOTING » NONFINAL » FOOTFORIVI. ALIGN » PARSE-SYLLABLE.

c. / pesarha: j am / 'my sons'

pe.sar + ha: +'am/	ROOTING	FOOTFORM	ALIGN	NONFINAL	PARSE-SYLLABLE
a. pe.sar.ha:.jam.	*!				
b.(pe.sar.)ha:.jam.		*!	*		*
c.(pe.sar.) a:.jam.			*!		*
d.pe(sar. ha:.)jam.		*!	*		
e.→pe(sar.ha:) jam.				*	
f. (pesr.) ha.jm.		*!			
e.pe.sar.(ha:.jam.)				*	*!

(6)   Marked (word - initial) stress pattern in Persian

a. / begu:/ 'say, imperative'

/ be + u: /	ROOTING	NONFINAL	FOOTFORM	ALIGN	PARSE-SYLLABLE
a. be. gu:	*!				
b. (be. u:)		*!			
c. be.g u:)				*	
d. be. gu:		*!			

(d) is unacceptable because the syllables are unfooted.

b. /mi:gu:jam/   'I say'

/mi: + gu:+ 'am/	ROOTING	NONFINAL	FOOTFORM	ALIGN	PARSE-SYLLABLE
a. mi:. u:. 'jam.	*!				
b.→(mi:.gu:.)jam.			*		
c.(mi:. gu:.) jam.		*!			
d. mi:. (gu:. jam.)		*!			
e. mi:. (gu:. jam.)	*	*!			

c. / nemi:gu:jam / 'I don't say'

/ne+mi:+gu:+'am/	ROOTIN G	NONFINA L	FOOTFORM	ALIGN	PARSE- SYLLABLE
a. ne. mi:..gu:. jam.	*!				
b→(ne.mi.:)gu:.jam.			•	•	•
c. (ne. mi:.)gu:.jam.		*!		•	•
d→ne.(mi:.gu:.)jam.			•	•	
e. ne.(mi:.gu:.)jam.		*!			
e. ne.mi:.(gu:.jam.)		*!			•
f. ne.mi:.(gu:.jam.)		*!			•

Here again, the candidates (b) and (d) are shown as optimal, since the undesired "ne.(mi:. gu:)jam" has still less cases of violation than the desired (ne.mi:)gu:.jam. The reason would be seen in the morphological status of the word, as is shown in the input, which consists of two stress bearer prefixes, i.e., /ne/ and /mi:/. In the absence of the negation marker /ne/ the stress would be on the present (continuous) prefix /mi:/ (see 6b), but the prefix /ne*/ reshifts the stress on to the beginning syllable of the new word. So/nemi:gu:jam/ is the real optimal candidate.

So far in this writing an attempt has been made to present the mechanisms of the OT through specifying the roles being played by them in the entire system. These mechanisms, namely GEN and EVAL are activated in the process of syllabification of words and stress assignment in Persian. The number of constraints involved in each of these cases along with their hierarchical rankings provide a theoretical base for dealing with the peculiarities of the language in question, i.e., Persian. An instance of this sort of peculiarity, i.e., variation in stress assignment - the one referred to as the marked stress with its word - initial stress - is dealt with through ranking NONFINAL above FOOTFORM.

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