


1980

Linguistic Rhythm and Grammatical Structure in Afghan Persian

Janet Mueller Bing

Old Dominion University, jbing@odu.edu

Follow this and additional works at: https://digitalcommons.odu.edu/english_fac_pubs

 Part of the [Modern Languages Commons](#), [Near Eastern Languages and Societies Commons](#), and the [Phonetics and Phonology Commons](#)

Repository Citation

Bing, Janet Mueller, "Linguistic Rhythm and Grammatical Structure in Afghan Persian" (1980). *English Faculty Publications*. 15. https://digitalcommons.odu.edu/english_fac_pubs/15

Original Publication Citation

Bing, J.M. (1980). Linguistic rhythm and grammatical structure in Afghan Persian. *Linguistic Inquiry*, 11(3), 437-463. doi: <http://dx.doi.org/10.2307-4178175>

Linguistic Rhythm and Grammatical Structure in Afghan Persian

Author(s): Janet Mueller Bing

Source: *Linguistic Inquiry*, Vol. 11, No. 3 (Summer, 1980), pp. 437-463

Published by: [MIT Press](#)

Stable URL: <http://www.jstor.org/stable/4178175>

Accessed: 09-03-2016 17:45 UTC

Your use of the JSTOR archive indicates your acceptance of the Terms & Conditions of Use, available at <http://www.jstor.org/page/info/about/policies/terms.jsp>

JSTOR is a not-for-profit service that helps scholars, researchers, and students discover, use, and build upon a wide range of content in a trusted digital archive. We use information technology and tools to increase productivity and facilitate new forms of scholarship. For more information about JSTOR, please contact support@jstor.org.



MIT Press is collaborating with JSTOR to digitize, preserve and extend access to *Linguistic Inquiry*.

<http://www.jstor.org>

Janet Mueller Bing

Linguistic Rhythm and Grammatical Structure in Afghan Persian

Within the past few years, a number of arguments have been made supporting a new theory of stress and linguistic rhythm proposed in Liberman (1975). The differences between Liberman's Metrical Theory and the Standard Theory (as introduced in Chomsky and Halle (1968)) were elaborated in Liberman and Prince (1977), and a new formal treatment of the well-known Rhythm Rule in English was proposed. This article presents a partial analysis of the stress patterns in Dari, the dialect of Persian spoken in Afghanistan,¹ and offers further evidence for the hierarchical metrical trees proposed by Liberman. What is interesting about stress in Dari is that, if one assumes a rhythm rule similar to the one that has been proposed for English, it is not necessary to distinguish between rules which assign word stress and rules which assign phrasal stress. More significant, however, is the fact that the assumption of such a rhythm rule predicts an "exceptional" stress pattern on prenominal modifiers, a stress pattern which, in fact, exists. An analysis within the Standard Theory must treat word and phrasal stress patterns as unrelated, and such an analysis must contain additional rules to account for the "exceptional" prenominal stress patterns.

In this article I will describe the underlying stress system for Dari nouns and noun phrases and will argue that the proposed Rhythm Rule not only accounts for variations of stress patterns in different contexts (analogous to the *thirteen³/thirteen¹ men² alternation* in English) but also can account for the pattern of word stress and for the stress pattern characteristic of measure phrases and "kind of" phrases in Dari.

Most of the data on which this analysis is based are found in *Farsi Reference Manual* by Ehsan Entezar,² and additional information was obtained from Mr. Abdul Fahrangi, Mr. Ahad Shahbaz, and Dr. Alam Miran.³ The dialect studied is the one used by educated speakers from Kabul, Afghanistan. The segmental phonological symbols are those used and described in Entezar's book. The symbols used by Entezar to mark

¹ The official name of Afghan Persian was changed from Farsi to Dari in 1964.

² Books and tapes are available from the School for International Training of the Experiment in International Living, Kipling Road, Brattleboro, Vermont.

³ I would like to thank Dr. Miran for offering suggestions and corrections of an earlier version of this article, and for providing me with additional examples for this version. I must, however, accept full responsibility for any errors in transcribing the data. I would also like to thank Dick Demers, Ralph Goodell, Helen Goodluck, S. J. Keyser, Alan Prince, and Elisabeth Selkirk for their suggestions.

four degrees of relative stress have been changed to numbers, with 1 marking primary stress and 4 marking unstressed syllables.

1. Word Stress for Nouns, Adjectives, and Prepositions in Dari

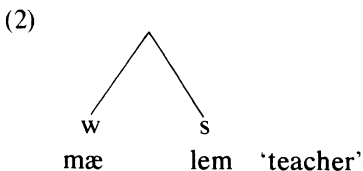
In spite of the fact that Persian has a very rich derivational morphology, there is no evidence for a cyclic application of stress rules on nouns, prepositions, or adjectives. Word stress for these categories is predictable, independent of the apparent structure of the word. Regardless of whether a word is apparently derived from other words (*ašpæzxanæ* 'kitchen' from *ašpæz* 'cook' and *xanæ* 'room'), is borrowed from another language (*šikægo:* 'Chicago'), or has no obvious morphological boundaries (*byadær* 'brother'), the stress pattern can be predicted from the number of syllables the word contains. For example:

(1) $\begin{matrix} 2 & 1 \\ \text{mæ} & \text{lem} \end{matrix}$ 'teacher' $\begin{matrix} 2 & 1 \\ \text{wæ} & \text{xætær} \end{matrix}$ 'earlier' $\begin{matrix} 2 & 1 \\ \text{palu} \end{matrix}$ 'next to'	$\begin{matrix} 2 & 4 & 1 \\ \text{zendæ} & \text{gi} \end{matrix}$ 'life' $\begin{matrix} 2 & 4 & 1 \\ \text{særgarmi} \end{matrix}$ 'amusement' $\begin{matrix} 2 & 4 & 1 \\ \text{næwæ} & \text{xætær} \end{matrix}$ 'later'	$\begin{matrix} 2 & 4 & 3 & 1 \\ \text{ašpæ} & \text{zxanæ} \end{matrix}$ 'kitchen' $\begin{matrix} 2 & 4 & 3 & 1 \\ \text{azordæ} & \text{gi} \end{matrix}$ 'vexation' $\begin{matrix} 2 & 4 & 3 & 1 \\ \text{gereftæ} & \text{ni} \end{matrix}$ 'ready for taking'
--	---	--

The derivations of these words are very different. For example, *zendægi*, *azordægi*, and *gereftæni* derive from the addition of the nominalizer *-(g)i* to *zendæ* 'alive', *azordæ* 'vexing', and *gereftæn* 'to take', respectively. *næwæxtær* can be analyzed as *næ-* 'negative' + *wæxt* 'early' + *-ær* (a comparative suffix).

Metrical theory assumes that the assignment of stress is relative rather than absolute, so that syllables are not assigned a particular degree of stress, but are marked only in terms of whether they are stronger or weaker than nearby syllables. The use of a "metrical tree" for reflecting relative degrees of stress was introduced by Liberman (1975), who gives a detailed analysis of how such metrical trees could be constructed for English words and phrases. For Dari, it is possible to construct metrical trees which would account for the facts on an observational level in a number of ways. Both sets of rules for word stress in Dari which I will propose are observationally adequate, but one set of rules makes an interesting prediction.

For words of two syllables, the labeling of the metrical tree is obvious, since the greatest degree of stress falls on the final syllable of the words in question:



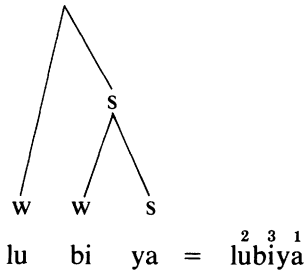
The syllable *lem* is marked *s* (strong) in relation to the first syllable, which by convention is marked *w* (weak). On the basis of the stress pattern of two-syllable words, the following rule for the assignment of prominence is proposed:

$$(3) N_2 \rightarrow s / N_1 \text{ —}$$

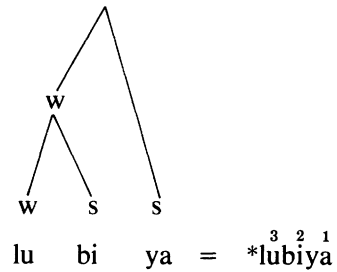
This rule says that, given a binary branching tree, assign *strong* to the rightmost node (N_2) and, by convention, *weak* to the left sister.

However, an attempt to apply rule (3) to assign stress to the possible metrical trees for three- and four-syllable words fails; none of the possible combinations of right or left or alternating branches plus the application of (3) results in the correct relative stress patterns for both three- and four-syllable words. For example:

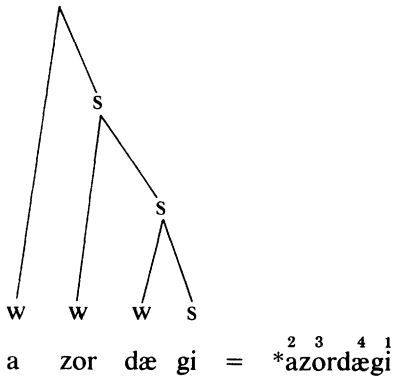
(4) a.



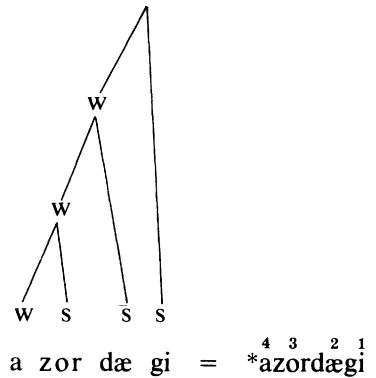
b.



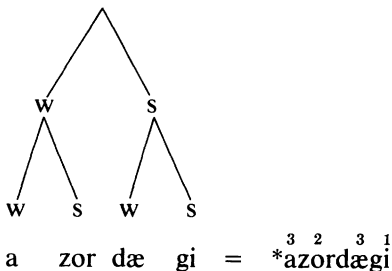
(5) a.



b.



c.



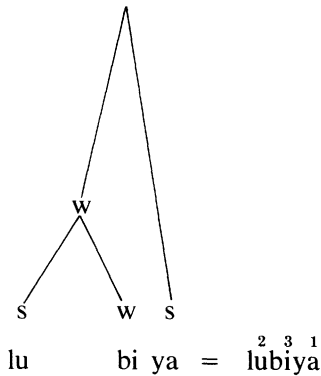
Although Liberman and Prince reject the notion of absolute levels of stress implied by

the numerical notation, they do suggest a procedure for translating the metrical hierarchies into numerical notation (1977, 259):

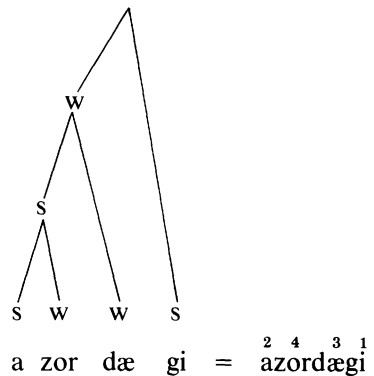
- (6) If a terminal node t is labelled w , its stress number is equal to the number of nodes that dominate it, plus one. If a terminal node t is labelled s , its stress number is equal to the number of nodes that dominate the lowest w dominating t , plus one.

Assuming that the relative degrees of stress marked in the original data are correct,⁴ the metrical trees which would be needed for three- and four-syllable words in Dari would be (7a) and (7b), respectively:

(7) a.

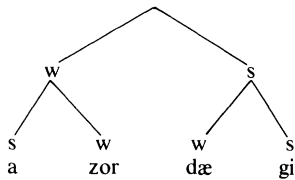


b.



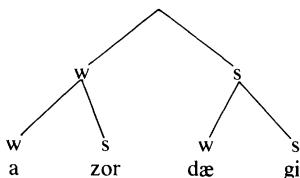
⁴ It is possible that Entezar's assumption of four degrees of stress influenced the way he assigned prominence in the dialogues. For four-syllable words I am unable to perceive any difference in prominence between the second and third syllables and I suspect that another possible assignment of prominence would be as follows:

(i)



However, because I am not a native speaker of Dari, I have felt obliged to accept the relative prominence assigned by Entezar. I would like to emphasize that even if the stress pattern for four-syllable words is that given in (i) rather than (7b), the generalization about the Rhythm Rule which will be made will still hold, since the underlying form for (i) would be (ii).

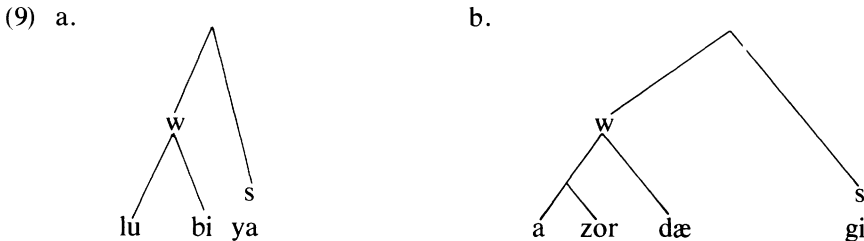
(ii)



The relative prominence on (7a) and (7b) corresponds to the stress pattern marked in the original data, and I will assume that the rules needed must account for the pattern of prominence indicated. A straightforward way to account for word stress would be to assume a left-branching tree for words, and two rules of prominence assignment, one which assigns *strong* to the final syllable of a word and one which assigns *strong* to the left branch of all other pairs of nodes in the word. These rules could be stated formally as the following ordered pair, in which the symbol ## indicates the rightmost word boundary.

- (8) a. $N_2 \rightarrow s / N_1 \text{ ______ } ##$
 b. $N_1 \rightarrow s / \text{ ______ } N_2$

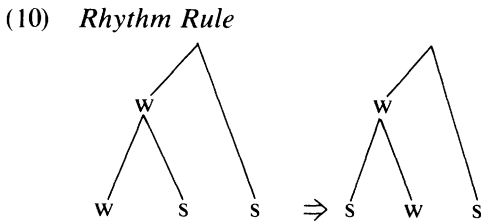
The application of (8a) to a left-branching tree would assign the values indicated in (9a,b):



The application of (8b) to the remaining nodes of (9) would produce the correct pattern of prominence indicated in (7a,b).

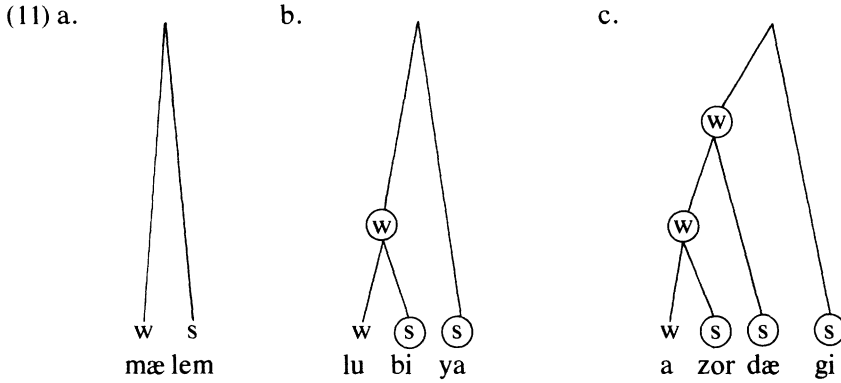
2. An Alternative Analysis: The Rhythm Rule

Another possible hypothesis about word stress in Dari would be the proposal that there is only one rule which assigns prominence, and that that rule assigns prominence to a right branch regardless of the domain of the rule. A second rule, a stress adjustment rule, would operate on the output of the right-prominence rule (which has already been stated as (3)). The proposed stress adjustment rule can be stated as (10).

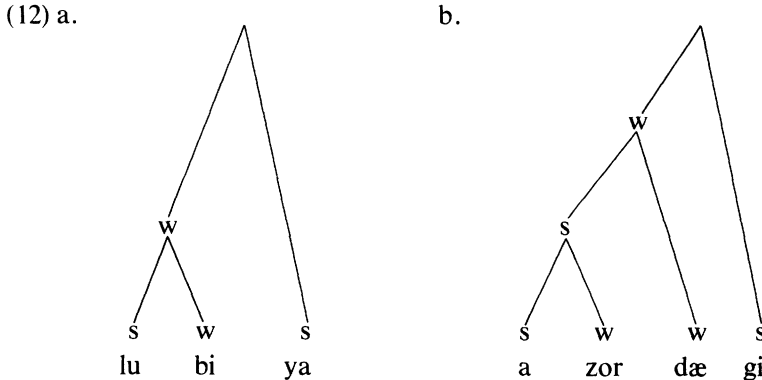


Rule (10) claims that if a strong node dominated by a weak node occurs to the left of another strong node, the leftmost strong node becomes weak and, by convention, its sister becomes strong.

Under this alternative analysis, rule (3) would assign *strong* to the rightmost node of any branching node in the metrical tree and would produce the following output for left-branching trees:



The structural description for the application of the Rhythm Rule (10) is met once in (11b), as indicated by the circled nodes, and twice in (11c). The application of (10) to these structures would produce the correct relative stress:



Note that the proposed Rhythm Rule must apply either simultaneously or from left to right, because a right to left application on (11c) would destroy the environment for a second application; in addition, it must apply in all cases where its structural description is met.

Two possible analyses for word stress have been proposed which are adequate on an observational level. They both assign the same relative stress to two-, three-, and four-syllable words. A choice between these analyses obviously cannot be based on the limited data presented here, and a theory of word stress cannot be based on only one language. I would like to propose that the analysis which claims that lexical stress is assigned by rules (3) and (10), although unusual, deserves further consideration primarily

because it makes two rather interesting claims. The first claim is that in Dari it is not necessary to distinguish between lexical and phrasal stress when assigning prominence. The second claim is that the Rhythm Rule in Dari is not merely a peripheral performance rule, but rather an inherent part of the system of prominence.

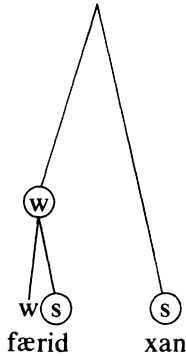
As one might expect, it is not difficult to find examples of the Rhythm Rule in Dari, comparable to the *thirteen men* type of examples which are well known in English. Consider the following expressions:

(13) $\overset{2}{f} \overset{3}{a} \overset{1}{r} \overset{2}{i} \overset{1}{d}$ xan 'Fārid (a man's name) plus honorific'

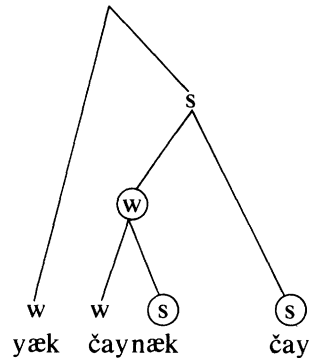
(14) $\overset{2}{y} \overset{3}{a} \overset{4}{e} \overset{1}{k}$ $\overset{3}{\check{c}} \overset{4}{a} \overset{1}{y}$ 'a pot of tea'

Because *fārid* and *čaynæk* have the stress pattern 2 1 in isolation, we can assume that the underlying structure for the phrases (13) and (14) might be the following:

(15) a.

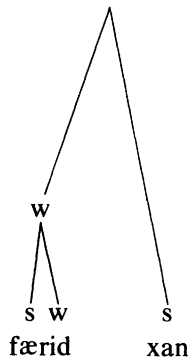


b.

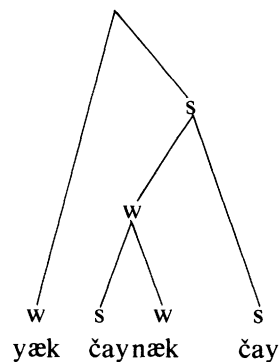


If we assume that the structures are correct, and that stress has been assigned by (3), the application of the Rhythm Rule (10) will produce the correct relative prominence, which would be as shown in (16a,b):

(16) a.



b.



(17)–(20) give further examples of phrases in which the Rhythm Rule has apparently applied:

(17) $\overset{3}{n}\overset{4}{ə}\overset{1}{j}\overset{2}{i}\overset{1}{b}$ jan 'Najib, friend.'

(18) $\overset{4}{y}\overset{2}{ək}$ $\overset{2}{č}\overset{4}{ar}\overset{4}{ək}$ $\overset{4}{b}\overset{1}{ur}\overset{2}{ə}$ 'a *čarak* (measure of weight, quarter) of sugar'

(19) $\overset{3}{y}\overset{2}{ək}$ $\overset{2}{p}\overset{4}{i}\overset{3}{y}\overset{1}{al}\overset{1}{ə}$ mas 'a cup of yoghurt'

(20) $\overset{2}{p}\overset{4}{i}\overset{1}{y}\overset{1}{al}\overset{1}{ə}$ 'cup'

The Rhythm Rule (10) predicts these data, although it is possible to think of other explanations. For example, an alternative hypothesis⁵ would be that phrases such as *fərid xan* and *čaynək čay* have been lexicalized, and are stressed as a single complex word rather than as two separate words. Although this would be a plausible hypothesis for examples such as (13) and (17), it would make no sense for examples such as (14), (18), and (19). In addition to the fact that incorporating this proposal in the grammar would complicate an otherwise straightforward system of determiners and classifiers,⁶ this hypothesis would make it necessary for native speakers to distinguish between putative lexical items such as *čaynək čay* and phrases such as *čaynək čay*, which differ only in terms of stress patterns. Rather than propose parallel systems of lexical items and phrases, differing only in prominence, it seems more reasonable to assume that some sort of rhythm rule is needed, and to discover why it applies in some environments, but not in others. However, before we investigate further the application of the Rhythm Rule, it is necessary to propose some rules for phrasal stress.

3. Stress for Noun, Adjective, and Prepositional Phrases in Dari

Word stress for nouns, adjectives, and prepositions places the greatest degree of stress on the rightmost syllable of the word. Similarly, phrasal stress places the most prominent

⁵ This alternative was pointed out to me by both Helen Goodluck and Robin Cooper.

⁶ For example, there is no obligatory determiner for most common nouns in Dari, as the following sentences illustrate:

(i) *čaynək peš-e mæs* 'I have (a) teapot.'

(ii) *čay peš-e-mæs* 'I have tea.'

However, with classifiers or measure phrases, there *is* normally an obligatory number or article, as (iii)–(v) illustrate:

(iii) *do pæw se:b gereftom* 'I took two pounds of apples.'

(iv) *yək pæw se:b gereftom* 'I took a pound of apples.'

(v) **pæw se:b gereftom* ('I took a pound of apples.')

By assuming that *čaynək čay* was a complex word rather than a classifier plus noun, we would be forced to mark this particular lexical item as obligatorily taking a determiner in order to explain the ungrammatical (vi):

(vi) **čaynəkčay peš-e mæs* 'I have a pot of tea.'

Rather than assume an otherwise unmotivated lexical marking for a complex word, it seems more reasonable to assume that *yək čaynək čay* 'a/one teapot (of) tea' takes an obligatory determiner for the same reason that other Q-phrases do.

stress on the rightmost word in noun phrases, adjective phrases, and prepositional phrases. If one assumes the analysis which assigns word stress by rules (3) and (10), it is not necessary to add yet more rules to account for the phrasal stress of the categories under discussion.⁷ However, one final rule is needed to account for the stress pattern of noun phrases, a rule which demotes stress on enclitics and suffixes. This rule is very general in Dari, and accounts for the stress patterns on pronominal enclitics, inflectional suffixes, and verb affixes. Although some of these bound forms are clearly enclitics, I will refer to both enclitics and syntactically derived affixes as inflectional affixes, since the distinction between them is not relevant to the discussion. (I am assuming the arguments in Siegel (1970) for distinguishing between inflectional and derivational morphology.) In the examples (21)–(25), only primary and secondary stress are marked. The vowel which occurs between the head noun and its complements is traditionally called the *ezafe* or *ezafe particle*; it never receives any degree of stress. In Bing (1977), arguments are made for an epenthesis rule which places the *ezafe* in surface structure.

- (21) ketab-e-tan¹ ‘your book’ (bound pronominal form)
 (22) ketab-e-šoma² ‘your book’ (free pronominal form)
 (23) ketab-e-ja²n¹ ‘John’s book’
 (24) bær-e-ja²n¹ ‘for John’
 (25) bær-e-tan¹ ‘for you’

In addition to the bound pronouns, there are a variety of inflectional suffixes on which stress is weak. For example, the suffix *-ra/-æ*, traditionally called the definite object marker, and the suffix *-am* ‘also’ have less prominence than the words to which they become attached.

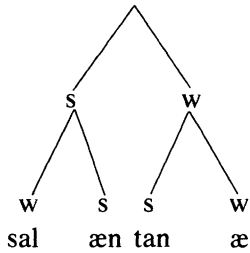
Although the generalization which seems to be called for might appear to be “destress inflectional suffixes”, the situation is not quite that simple. Consider the following example:

- (26) salæn-e-tanæ⁴ ‘your side dishes’
 side dishes + *ezafe* + your + object marker

Assuming that the *ezafe* epenthesis has not yet taken place, the relative prominence in (26) can be shown as (27):

⁷ Those readers familiar with Persian will undoubtedly realize that it will be necessary to make some provision to prevent rule (3) from applying to verbs and verb phrases, since stress tends to fall on the initial syllable of verbs and on the word preceding the verb in the verb phrase. The revised version of (32) accounts for the prominence on many verbs, but the rule would have to be further revised to account for verb phrase prominence. See Bing (1976) for further discussion of stress patterns on verbs.

(27)



The pronoun *-tan* is weak in relationship to the noun, but strong in relationship to the object marker, *-(r)æ*.

What is perhaps most surprising is that prominence is always leftward regardless of whether the inflectional affix precedes or follows the stem. Consider the following verb forms:

(28) $ræft$ 'he left' (ϕ pronoun)

(29) $ræftom$ 'I left' (stem + pronoun)

(30) $me:ræft$ 'he was leaving' (imperfect marker + stem)

(31) $me:ræftom$ 'I was leaving' (imperfect marker + stem + pronoun)

The generalization which emerges is that if one branch of a metrical pair is an inflectional affix, the left branch will be strong. This can be stated slightly more formally as (32), which is a restatement of (3):

(32) In a configuration $c[A B]_c$

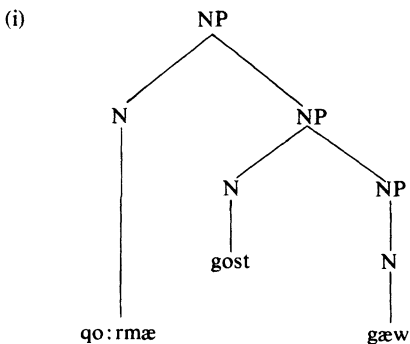
a. if either A or B is an inflectional affix, then A is strong.

b. otherwise B is strong.

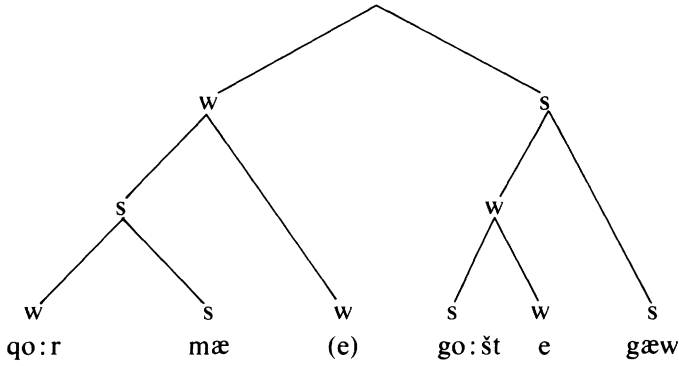
Several derivations illustrate how the rules proposed so far apply:

(33) $qo:rme$ $go:šte$ $gæw$ 'beef stew (lit. stew of meat of cow)'⁸
 stew+E+ meat+E+ cow

⁸ The assimilation of [æ] to [e] and other vowel assimilation rules are discussed in Bing (1976). The symbol E is used to mark the *ezafe*, which can usually be translated 'of'. The underlying structure for (33) is (i):



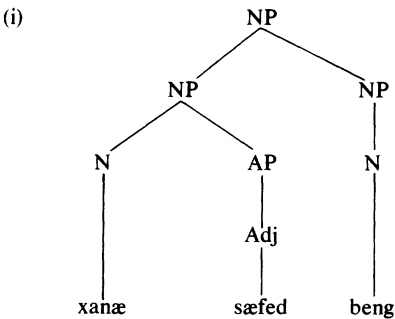
(34)



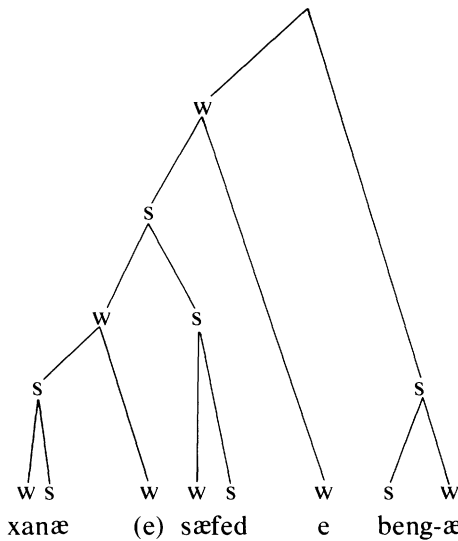
Since there are no inflectional affixes in (33), all right branches are strong. The Rhythm Rule does not apply, undoubtedly because of the presence of the *ezafe* particle. I have been unable to find a single example of the application of the Rhythm Rule in an *ezafe* construction, even in instances such as (35), where [æ] + [e] has assimilated to [e:].

- (35) ^{4 3} xane: ^{4 2} səfed ^{1 2} bengæ⁹
 house+E white+E Bing + object marker
 'the white house of the Bings'

⁹ The underlying structure for (36) would be (i):



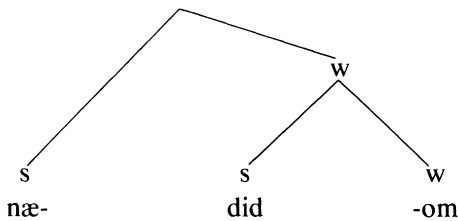
(36)



The object marker at the end of the phrase is weak, but otherwise all right branches are strong.

(37) ^{1 2 3} nædidom 'I didn't see. . .'

(38)



In (38), prominence is assigned to the left branch of *didom* 'I saw' and to the left branch of *nædidom* because of the inflectional affixes.

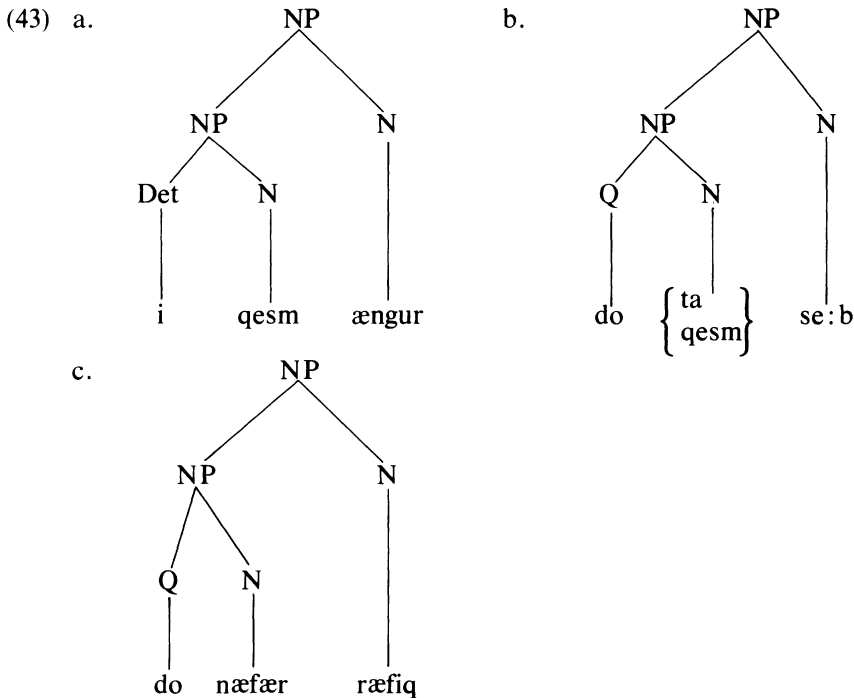
Although the analysis up to this point has been explained within the framework of the Metrical Theory, it should be obvious that any of the rules proposed could be stated within the Standard Theory of generative phonology. In section 4, the rules are stated in Standard Theory notation and can account for the data discussed so far. However, even though either theory can account for the correct stress patterns for the majority of noun, adjective, and prepositional phrases, there is one class of noun phrases which must be treated as exceptional by the traditional analysis, but which has exactly the stress pattern predicted by the Metrical Rule (32) and the Rhythm Rule (10).

In Dari there are some noun phrases which precede the head noun, are not connected to the head noun by the *ezafe*, cannot be paraphrased by an *ezafe* construction

following the head noun, and do not show plural agreement with the head noun.¹⁰ These noun phrases are often called “measure phrases” and “kind phrases” in grammars and are stressed differently from other types of noun phrase constructions.

- (39) ² i ³ qesm ³ ængur ¹ ‘this kind (of) grape’
- (40) ² do ³ qesm ¹ se:b ‘two kind(s) of apple’
- (41) ² do ³ ta ¹ se:b ‘two (classifier) apple(s)’
- (42) ² do ⁴ næfær ³ ræfiq ³ ¹ ‘two (classifier) friend(s)’

If we assume the most natural semantic parsing for these phrases and the fact that quantifier and qualifier phrases (henceforth Q-phrases) are found in mutually exclusive environments, a first approximation of the underlying structure of these noun phrases with the head noun would be as follows:



In addition, there is syntactic evidence to indicate that the Q-phrases are constituents,

¹⁰ This definition eliminates a class of words which usually precede what seems to be the semantic head of a noun phrase such as (i)–(ii):

- (i) tæmam-e ræfiqa ‘all the friends’
- (ii) baz-e ketaba ‘some books’

A number of arguments are given in Bing (1977) to show that these words function as head nouns rather than as specifiers, and are different structures from those in (43).

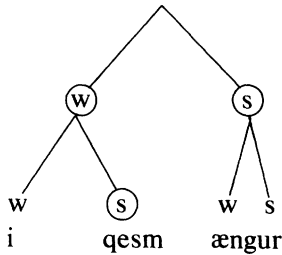
as the proposed structures in (43) claim. For example, although (44b), which includes the classifier, is a possible response to (44a), (44c), without a classifier, is not an appropriate response.

- (44) a. čeqæ se:b mexayi? 'How many apples do you want?'
 b. se: danæ 'Three (classifier).'
 c. *se: 'Three.'

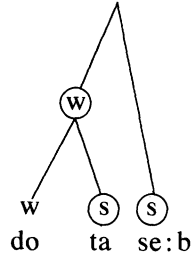
Other facts indicate not only that the Q-phrases are constituents, but also that they are noun phrases. However, a relabeling of the phrasal node would have no effect on the stress pattern, since phrasal stress is the same for all categories except for verb phrases,¹¹ and there is no evidence to show a relationship between these prenominal modifiers and verb phrases.

Assuming the structures in (43), the stress assignment rule (32), and the Rhythm Rule (10), the correct stress for Q-phrases is predicted. The assignment of prominence by (32) will result in rightward dominance in all cases, since there are no inflectional affixes.

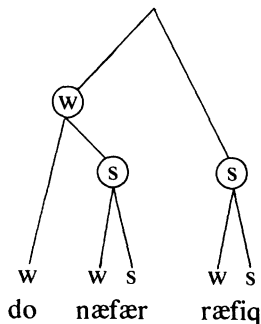
(45) a.



b.



c.

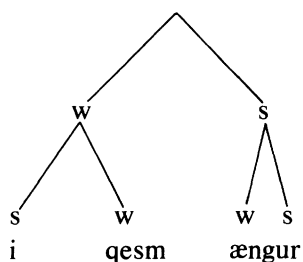


The structural description for the Rhythm Rule is met, and the application of (10) results

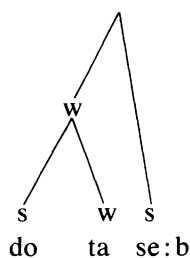
¹¹ See note 7.

in the correct relative stress patterns:

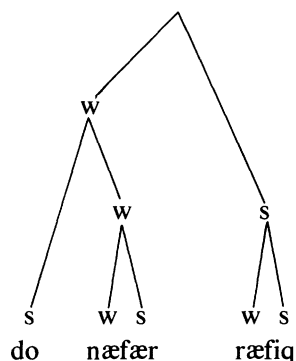
(46) a.



b.



c.



Considered individually, the claims that rules (32) and (10) account for word stress, or that they account for phrasal stress, or that they account for the rhythmic phrasal phenomenon found in examples (13)–(19), or that they account for the “exceptional” stress found on Q-phrases, are not particularly convincing. However, the fact that these two rules can account for all the data discussed so far makes this analysis much more appealing, particularly because the rules themselves are quite simple. In addition, there is further evidence which suggests that the proposed analysis is correct. This evidence comes from an examination of the environments in which the Rhythm Rule does and does not apply.

Consider the following sentences:

- (47) ¹lotfæn ²yæk ³xo:rak ³qabeli ²bærem ⁴byar ²byar
 please an order Qabeli for me bring
 ‘Please bring me an order of Qabeli.’¹²

¹² Entezar (1964, 72). The translation given by Entezar is ‘Please bring me one order of Qabeli’ (Qabeli is a type of pilau).

- (48) $\overset{1}{yæk}$ $\overset{4}{xo}:\overset{2}{rak}$ $\overset{3}{q} \overset{3}{\overset{1}{a}} \overset{1}{b} \overset{1}{e} \overset{1}{l} \overset{1}{i}$ $\overset{3}{š} \overset{1}{or} \overset{3}{wa}$ $\overset{3}{wæ}$ $\overset{1}{yæk}$ $\overset{3}{č} \overset{2}{aynæk}$ $\overset{1}{čay}$
 one order Qabeli soup and one teapot tea
 'One order of Qabeli, soup, and one pot of tea.'¹³
- (49) $\overset{3}{yæk}$ $\overset{2}{čaynæk}$ $\overset{1}{čay} \overset{4}{e}$ $\overset{1}{sya}$ $\overset{2}{baz}$ $\overset{3}{bæ} \overset{4}{rem}$ $\overset{1}{byar}$
 one teapot teaE black later for me bring
 'Bring me a pot of black tea later.'¹⁴

There are a number of facts to account for in (47)–(49). In (47), in the phrase *yæk xo:rak qabeli* 'an order of Qabeli', the stress is stronger on *xo:rak* than on *yæk*, whereas in (48), with the same phrase, the stress is stronger on *yæk*. The same phenomenon occurs with the phrases *yæk čaynæk čay* 'a pot of tea' in (48) and (49), with the word *yæk* receiving stronger stress than *čaynæk* in (48), but weaker stress in (49). In addition, some sort of rhythm rule has applied in (48) to give the first syllable of *čaynæk* more prominence than the second syllable, but in (49), no such rhythmic phenomenon has occurred.

The differences in the various degrees of relative stress on *yæk* may be accounted for by the fact that *yæk* may mean either 'one', a quantity, or 'a'; in the sentences (47)–(49), Entezar's translations have been altered to reflect this difference. In most contexts the difference in meaning is not important, but in other contexts, only one meaning is permissible. For example, in phrases such as *yæki digær*, the expression means only 'another' and not 'one other'. In most cases, the difference can be discerned by substituting a number for *yæk* in the sentence in which it occurs. The substitution of *se:* 'three' for the occurrences of *yæk* in (47) and (49) alters the stress pattern, but no change results from the same substitution in (48). If we assume that *yæk* 'one' and *yæk* 'a' occur in different structures, it is possible to account for the stress patterns on *yæk čaynæk čay* in (48) and (49), repeated here as (50) and (51), respectively. Entezar's transcription does not reflect the fact that the head noun receives greater prominence than the phrase preceding it, a fact verified by informants, and the transcription has been altered to reflect this fact. Other than this, the relative stress between syllables is the same as in the original dialogue.¹⁵

¹³ Entezar (1964, 73). Entezar's translation is 'Please bring me one order of Qabeli, soup, and a pot of tea.'

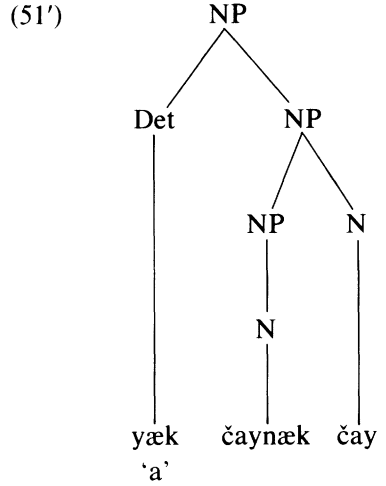
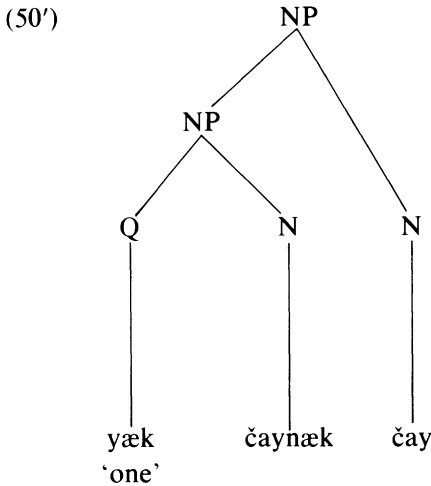
¹⁴ Entezar (1964, 73). The translation is the one given by Entezar.

¹⁵ It should be noted here that in the derivations and transcriptions used in this article, it is the *relative* degree of stress which is considered significant rather than an arbitrary numerical degree of prominence. That is, if one derivation results in an assignment of values $\overset{3}{b} \overset{4}{æ} \overset{1}{r} \overset{1}{e} \overset{1}{m}$ *bærem byar* (or the equivalent metrical tree as translated by (6)), and another results in the assignment $\overset{2}{b} \overset{3}{æ} \overset{1}{r} \overset{1}{e} \overset{1}{m}$ *bærem byar*, the difference is not considered significant, since the syllables are still stressed the same in relation to each other. However, if another derivation would result in the assignment $\overset{4}{b} \overset{3}{æ} \overset{1}{r} \overset{1}{e} \overset{1}{m}$ **bærem byar*, this would be judged as significantly different from the previous two transcriptions, since the syllables are stressed differently relative to each other.

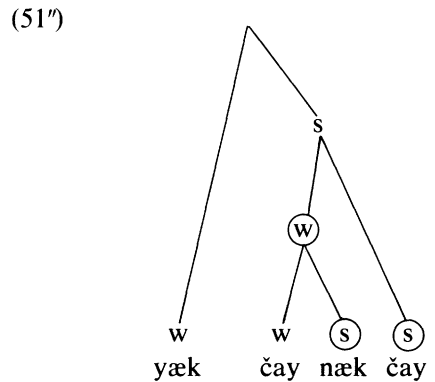
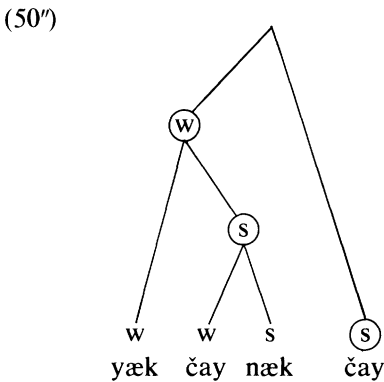
(50) yæk² čaynæk⁴ čay³ čay¹ 'one pot of tea'

(51) yæk² čaynæk³ čay⁴ čay¹ 'a pot of tea'

In order to account for the fact that the Rhythm Rule has applied differently to these two expressions, it is necessary to see the structures underlying both of them:



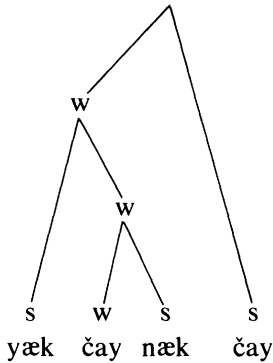
The prominence rule (32) assigns the following values to the structures (50') and (51'):



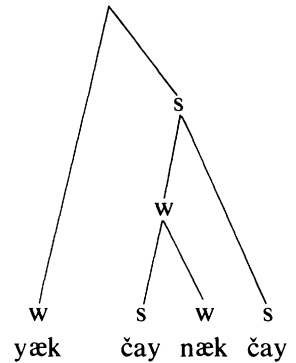
The environment for the application of the Rhythm Rule (10) is met in both structures,

but the outputs are different, producing the correct results in both cases:

(50''')



(51''')



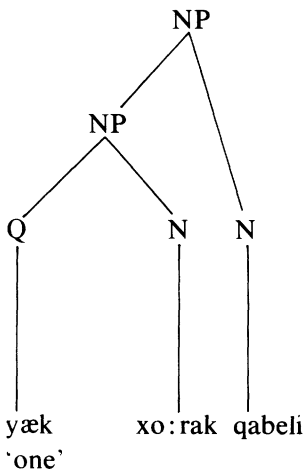
This metrical analysis not only makes the correct prediction for the stress patterns on these two phrases; it also offers an explanation for why the Rhythm Rule applies on a phrasal level in (50), but within the word in (51). This example also suggests that the hypothesis that there is a relationship between the unusual stress pattern of measure phrases and the proposed Rhythm Rule is a valid one; the fact that the *thirteen men* phenomenon occurs on *čaynæk* in (51) but not in (50) must surely be more than coincidence.

Accepting the hypothesis that the Rhythm Rule accounts for both the *thirteen men* phenomenon and the stress pattern on Q-phrases makes it possible to account for the differences in relative stress on the phrases *yæk xo:rak qabeli* 'one/an order of Qabeli' in (47) and (48). Assuming structures similar to those proposed in (50') and (51'), the phrases in (52) and (53) would have the structures in (52') and (53'), respectively:

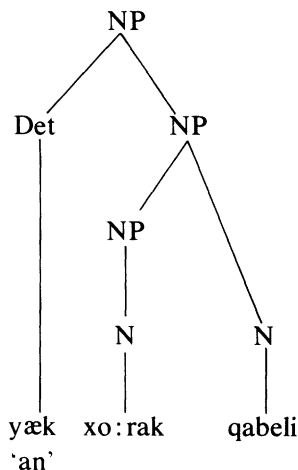
(52) ² yæk ⁴ xo: ³ rak ³ ⁴ ¹ qabeli
'one order of Qabeli'

(53) ³ yæk ³ xo: ² rak ³ ⁴ ¹ qabeli
'an order of Qabeli'

(52')

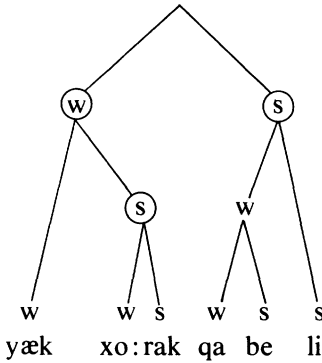


(53')

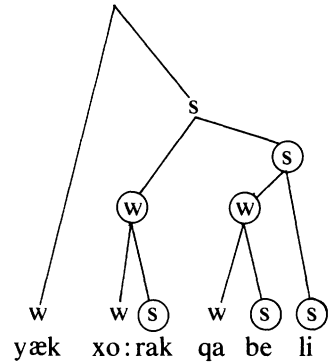


The assignment of prominence by (32) would give the following metrical trees.

(52'')



(53'')



Note, however, that this derivation indicates that the statement of the Rhythm Rule is too strong. Within the structure (53'') the structural condition for the Rhythm Rule is met twice, but if it applied in both places, the output of the rule would not be consistent with (53). Why is it, then, that the Rhythm Rule has apparently applied to (50''), to (51''), and to (52''), but not to (53'')? One possible reason for the difference might be the fact that *čay* has one syllable and *qabeli* has three. Consider the following examples:

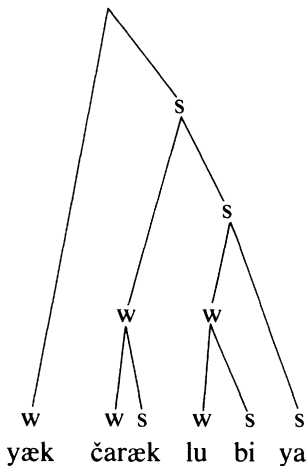
(54) ^{3 2 4 3 1} yæk piyalæ mas 'a cup of yoghurt' (= (19))

(55) ^{3 3 2 3 4 1} yæk čaræk lubiya 'a charak of beans'

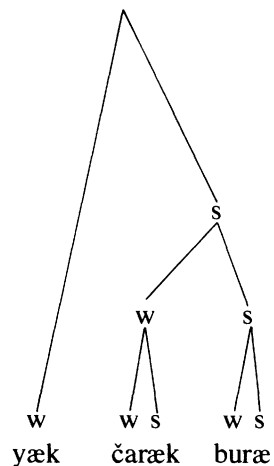
(56) ^{3 2 3 3 1} yæk čaræk buræ 'a charak of sugar'

The proposed underlying metrical structures for (55) and (56) are (55') and (56'):

(55')



(56')



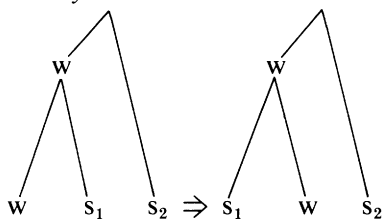
The generalization which seems to emerge from an examination of (53'') and (56'),

in which the Rhythm Rule does not apply, and (55') and (51'), in which it does apply, is that the rightmost strong syllable must be either on the same level or on the next adjacent level in the metrical tree. The notion of 'level' must be computed from the surface string up, not from the top down. To make the definition of 'level' somewhat more precise:

- (57) a. Node 1 is on the same level as Node 2 if the number of nodes between N_1 and T_1 is the same as the number of nodes between N_2 and T_2 , where T_1 and T_2 are part of the terminal string.
 b. N_1 and N_2 are on adjacent levels if the number of nodes between N_2 and T_2 is equal to the number of nodes between N_1 and T_1+1 or T_1-1 .

The restatement of the Rhythm Rule restricts its application so that it will not apply to (53'') or (55').

(58) *Dari Rhythm Rule*



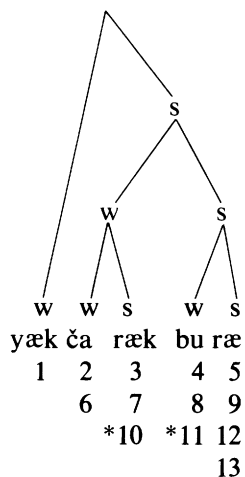
Condition: s_1 and s_2 must be on the same or adjacent levels.

The idea of levels defined here is very similar to the metrical grid discussed in Liberman and Prince (1977), but does not dissociate the levels from the metrical tree. Consider the metrical trees and metrical grids for the expressions below:

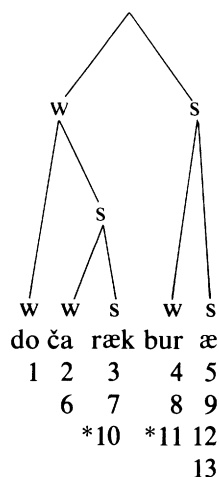
- (59) a. ⁴ yæk ^{2 3} čaræk ^{3 1} buræ
 'a charak of sugar'

- b. ² do ^{4 3} čaræk ^{3 1} buræ
 'two charaks of sugar'

c.

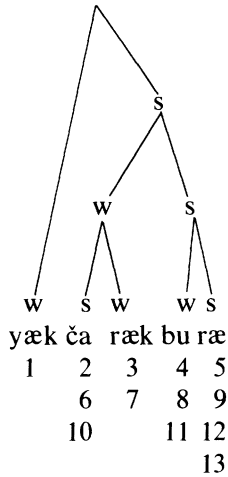


d.

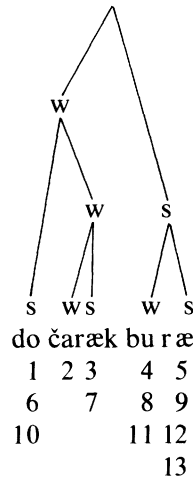


In both cases the “stress clash” can be described as the same on the metrical grid (see Liberman and Prince (1977) for a full discussion of this concept). However, in one case the resolution of the stress clash is (60a) and in the other case the resolution is (60b).

(60) a.



b.



The resolution of stress clash is determined by relationships within the metrical tree as well as by level in the metrical tree.

The restatement of the Rhythm Rule correctly accounts for the fact that the *thirteen men* rhythmic phenomenon will never occur if the measure phrase contains a number or if *yæk* ‘one’ is more prominent than the noun which follows it. For example:

- (61) do² čay⁴ næk³ čay¹
 (62) *do² čay³ næk⁴ čay¹
 (63) yæk² piyalæ⁴ čay⁴ čay³ (cf. (19))

The restatement also claims that the *thirteen men* phenomenon will not occur before words of three or more syllables, and this claim is consistent with the available facts.

The revised Dari Rhythm Rule (58) plus a rule of stress assignment (32) can account for a wide range of data: word stress, the *thirteen men* phenomenon, and the stress patterns of Q-phrases.¹⁶ What is most significant, however, is the evidence that patterns

¹⁶ The claim that the Rhythm Rule can account for the prominence on Q-phrases does not entail that this rule is the only explanation. Some instances of prominence are obviously discourse phenomena. For example, in the following discourse (Entezar (1964, 154)), the prominence on *do* ‘two’ obviously results from the destressing of ‘old information’ rather than from application of the Rhythm Rule. (See Ladd (1978) for a discussion of the destressing of old information.)

- (i) j: čæn sal dæ æmrika bude: n #
 ‘How long were you in America?’
 (ii) r: dō sal^{1 2}
 ‘Two years.’

of prominence *must* be represented by a metrical hierarchy. The stress patterns on examples such as (54)–(56) cannot be accounted for within the framework of the Standard Theory. In order to show why a metrical analysis is preferable to one within the framework of the Standard Theory, it is necessary to show briefly how the Standard Theory can be used to account for most, but not all, of the facts which have been described.

4. A Standard Analysis of Dari Stress

Beginning with the analysis of English stress in Chomsky and Halle (1968), the most widely accepted hypothesis for deriving the stress contours of words has been by the successive application of rules which assign stress to some vowels and which, by convention, simultaneously lower the stress of all other vowels within the domain of the rule to which some degree of stress had previously been assigned. Halle (1973) revised the stress subordination conventions which had been proposed in Chomsky and Halle (1968) and proposed a distinction between rules which assigned stress and those which assigned additional stress to vowels already carrying some degree of stress. Halle proposed that the stress lowering convention apply only to the latter kind of rule, such as the Compound Stress Rule or the Nuclear Stress Rule in English. By assuming, like Halle (1973), that stress subordination occurs only with rules of the form (64),

$$(64) \quad \underset{[1 \text{ stress}]}{V} \rightarrow 1 \text{ stress} / . . .$$

we can capture the fact that the final syllable of a word and the final word of a phrase receive the greatest prominence by a rule of Right Dominance. The following set of rules can account for the contours of both words and phrases:

- (65) a. *Stress Assignment*
 $V \rightarrow 1 \text{ stress} / \# Q_1 \text{ ____ } Q_2 \#$
 Condition: Q contains no ##
- b. *Destressing*
 $V \rightarrow [-\text{stress}] / \## C_0 V C_0 \text{ ____ } V C_0 Q \##$
 Condition: Q contains no ##
- c. *Right Dominance*
 $\underset{[1 \text{ stress}]}{V} \rightarrow 1 \text{ stress} / W \text{ ____ } Q (\#X)$
 Condition: Q contains no 1 stress
- d. *Adjustment Rule*
 $2 \ 2 \ 1 \rightarrow 2 \ 3 \ 1$

The symbols used are the standard ones, with V symbolizing vowel, C – consonant, ## – word boundary, # – inflectional affix boundary; the numbers are used to indicate degree of stress. Although the rules are presumed to apply cyclically, (65a) and (65b)

will, in fact, apply only at the level of the word because of the condition on the rules. The rule of Right Dominance (65c) will apply both at the level of the word and at the phrasal level. However, when it applies to a word containing an inflectional affix, the rule will apply to give left dominance. The Adjustment Rule (65d) is necessary for obtaining the correct contours in four-syllable words.

The following derivations illustrate the application of the rules, in the order stated.

(66)

Stress Assignment (65a)	¹ ¹ mælem 'teacher'	¹ ¹ ¹ lubiya 'bean'	¹ ¹ ¹ ¹ azordægi 'vexation'
Destressing (65b)	—	¹ ¹ lubiya	¹ ¹ ¹ azordægi
Right Dominance (65c)	² ¹ mælem	² ¹ lubiya	² ² ¹ azordægi
Adjustment Rule (65d)	—	—	² ³ ¹ azordægi

Limitations of space do not permit derivations which show that the rules proposed in (65) assign the same relative prominence to utterances such as (33) and (35) as do the metrical rules; the reader may confirm this himself.¹⁷ However, in order to account for examples such as (17) and (18), the Standard Theory must include some type of rhythm rule. This is probably best handled by a metathesis rule:

(67) *Metathesis Rule*

$$W \overset{2}{V} Q \overset{1}{V} C_0 \overset{1}{V} X \Rightarrow W \overset{1}{V} Q \overset{2}{V} C_0 \overset{1}{V} X$$

Condition: Q contains no 1 stress

The Metathesis Rule can account for much of the data accounted for by the Rhythm Rule if it is ordered before the rule of Right Dominance.

With the inclusion of the Metathesis Rule, the Standard Theory predicts the same relative prominence as the metrical rules do for (50), repeated here as (68).¹⁸

(68) [²yæk ⁴čaynæk] ³čay ¹'one pot of tea'

(69) Stress Assignment (65a)	NP[NP[q[² yæk]Q	N[⁴ čaynæk]N]NP	N[³ čay]N]NP
Metathesis (67)	—	—	—
Right Dominance (65c)	NP[NP[¹ yæk	² ¹ čaynæk]NP	¹ čay]NP
Metathesis (67)	—	—	—
Right Dominance (65c)	NP[² yæk	³ ¹ čaynæk	¹ čay]NP
Metathesis (67)	¹ yæk	³ ² čaynæk	¹ čay
Right Dominance (65c)	² yæk	⁴ ³ čaynæk	¹ čay

Similarly, the rules (65) and (67) predict the correct relative prominence for (51).

¹⁷ A complete list of ordered rules is given at the end of the article.

¹⁸ The Stress Assignment, Destressing, and Adjustment Rules will be omitted from derivations, since they will never apply in the derivations given. These omissions are merely an ink-saving device.

However, in spite of the fact that both the Standard Theory and the proposed Metrical Theory can provide a derivation that correctly predicts the pattern of prominence for these examples, in other cases the Standard Theory cannot capture the same generalizations because the Metathesis Rule (67) has no access to a stress hierarchy. For example:

(70) $\overset{2}{i} \overset{3}{qesm} \overset{3}{\text{ængur}} \overset{1}$ 'this kind (of) grape' (= (39))

(71) Stress Assignment (65a)	NP[NP[DET[$\overset{1}{i}$]] _{DET}]	N[$\overset{1}{qesm}$] _N]NP	N[$\overset{1}{\text{ængur}}$] _N]NP
Destressing (65b)	_____	_____	_____
Metathesis (67)	_____	_____	_____
Right Dominance (65c)	NP[NP[$\overset{1}{i}$]	$\overset{1}{qesm}$]NP	$\overset{2}{\text{ængur}} \overset{1}$]NP
Metathesis (67)	_____	_____	_____
Right Dominance (65c)	NP[$\overset{2}{i}$	$\overset{1}{qesm}$	$\overset{2}{\text{ængur}} \overset{1}$]NP
Metathesis (67)	_____	_____	_____
Right Dominance (65c)	$\overset{3}{*i}$	$\overset{2}{qesm}$	$\overset{3}{\text{ængur}} \overset{1}$

The derivation (71) incorrectly predicts that *qesm* 'kind' will be more prominent than *i* 'this'. Similarly, the output of the rules (65) and (67) would be the incorrect (72) and (73).

(72) $\overset{3}{*do} \overset{4}{næfær} \overset{2}{ræfiq} \overset{3}{\text{ængur}}$ (cf. (42) $\overset{2}{do} \overset{4}{næfær} \overset{3}{ræfiq} \overset{3}{\text{ængur}}$)

(73) $\overset{2}{*yæk} \overset{3}{\text{čaræk}} \overset{2}{buræ} \overset{3}{\text{ængur}}$ (cf. (56) $\overset{3}{yæk} \overset{2}{\text{čaræk}} \overset{3}{buræ} \overset{3}{\text{ængur}}$)

It might be possible to account for some of the facts within the framework of the Standard Theory, but not without some difficulty. First, it would be necessary to mark prenominal Q-phrases as exceptions to phrasal stress rules and to provide some explanation for their exceptionality. There are a number of formal devices which might be used, none of them very satisfactory.

It might be possible to motivate a boundary erasing rule which would, in effect, make the claim that only a clitic boundary is found between numbers and classifiers and between "kind" words and the words which precede them. However, such a rule would have no purpose except to explain the stress facts, and would be a counterintuitive (and probably incorrect) use of the notion of clitic boundary.

Another alternative would be to lexically mark number as [+prominent] and "quality words" (such as *qesm* in (70)) as [-prominent]. This explanation would only serve to make the Standard Theory observationally adequate, however, and would have the unfortunate result that phrases such as (74) would have double lexical markings to explain the stress pattern, which is the same as the one in (70):

(74) $\overset{2}{do} \overset{3}{qesm} \overset{3}{\text{ængur}} \overset{1}$ 'two kind(s) of grape(s)'
 [+prom] [-prom]

The need for such extensive and redundant lexical marking seems to indicate that some generalization is being lost, and this generalization seems to be the one captured by the Rhythm Rule.

Even if the prominence on Q-phrases can be accounted for with lexical features, the Metathesis Rule fails to account for the fact that some sort of rhythmic phenomenon is taking place in the second word of the phrases $yæk \overset{2}{č}aynæk \overset{4}{č}ay \overset{1}$ 'a pot of tea', $yæk \overset{4}{č}aræk \overset{2}{bur}æ \overset{3}{bur}æ \overset{1}$ 'a charak of sugar', which does not take place in $yæk \overset{2}{č}aynæk \overset{4}{č}ay \overset{3}{č}ay \overset{1}$ 'one pot of tea', in $yæk \overset{4}{č}aræk \overset{3}{lub}iya \overset{2}{lub}iya \overset{4}{lub}iya \overset{1}$ 'a charak of beans', or in $do \overset{2}{n}æfær \overset{4}{r}æfiq \overset{3}{r}æfiq \overset{1}$ 'two (classifier) friends'.

By assuming a Rhythm Rule for Dari within the framework of the Metrical Theory, it is possible to account for word stress, phrasal stress, and the stress on Q-phrases with the same rules. With this system it is not necessary to mark Q-phrases as exceptions to the dominant system of prominence. Because the metrical system is a hierarchy, the examples in the preceding paragraph can be accounted for within the system.

The Standard Theory, on the other hand, must claim that there is no relationship between the *thirteen men* phenomenon and the pattern of prominence on Q-phrases. It is not even possible to claim that the prominence pattern on (70) is related to that on (41) since the stress pattern on the former is the result of a lexical marking [-prominent] on *qesm* 'kind', and the stress pattern on the latter is the result of marking *do* 'two' [+prominent]. In addition, it will be necessary to add another rule to the grammar to apply before the rule of Right Dominance. This rule, stated as the Stress Prominence Rule, would erase the feature [+prominent] after the rule had applied.

(75) *Stress Prominence Rule (Feature Erasure)*

$$\begin{array}{ccc} V & \rightarrow & V \\ [+prom] & & [1 \text{ stress}] \end{array}$$

Even with rules of Stress Assignment, Destressing, Stress Adjustment, Stress Prominence, Lexical Marking, subsequent Feature Erasure, and Metathesis, there are examples which cannot be accounted for within the Standard Theory. The Metrical Theory not only can account for all the data, but does so by claiming that a number of apparently unrelated phenomena can be explained by one generalization, the Rhythm Rule.

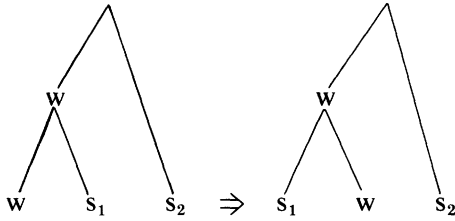
5. Summary of Rules

A. *Metrical Rules*

(32) *Stress Assignment*

In a configuration $c[A B]_c$

- a. if either A or B is an inflectional affix, then A is strong.
- b. otherwise B is strong.

(58) *Dari Rhythm Rule*

Condition: s_1 and s_2 must be on the same or adjacent levels.

B. *Standard Rules*(65) a. *Stress Assignment*

$$V \rightarrow 1 \text{ stress} / \#Q_1 \text{ ____ } Q_2\#$$

Condition: Q contains no ##

(65) b. *Destressing*

$$V \rightarrow [-\text{stress}] / \#\#C_0 V C_0 \text{ ____ } C_0 V C_0 Q\#\#$$

Condition: Q contains no ##

(75) *Stress Prominence Rule*

$$\begin{array}{ccc} V & \rightarrow & V \\ [+prom] & & [1 \text{ stress}] \end{array}$$
(67) *Metathesis Rule*

$$W \overset{2}{V} Q \overset{1}{V} C_0 \overset{1}{V} X \Rightarrow W \overset{1}{V} Q \overset{2}{V} C_0 \overset{1}{V} X$$

Condition: Q contains no 1 stress

(65) c. *Right Dominance*

$$V \rightarrow 1 \text{ stress} / W \text{ ____ } Q (\# X)$$

[1 stress]

Condition: Q contains no 1 stress

(65) d. *Adjustment Rule*

$$2 \ 2 \ 1 \rightarrow 2 \ 3 \ 1$$
References

- Bing, J. M. (1976) "Is the Cycle Necessary in Phonology?" ms., University of Massachusetts, Amherst, Massachusetts.
- Bing, J. M. (1977) "The Infinitive Phrase in Persian: Arguments for the Lexicalist Hypothesis," ms., University of Massachusetts, Amherst, Massachusetts.
- Chomsky, N. and M. Halle (1968) *The Sound Pattern of English*, Harper and Row, New York.
- Entezar, E. (1964) *Farsi Reference Manual*, Experiment in International Living, Putney, Vermont.
- Halle, M. (1973) "Stress Rules in English: A New Version," *Linguistic Inquiry* 4, 451-464.
- Ladd, D. R., Jr. (1978) *The Structure of Intonational Meaning*, Doctoral dissertation, Cornell University, Ithaca, New York.

RHYTHM AND STRUCTURE IN AFGHAN PERSIAN

- Liberman, M. (1975) *The Intonational System of English*, Doctoral dissertation, MIT, Cambridge, Massachusetts.
- Liberman, M. and A. Prince (1977) "On Stress and Linguistic Rhythm," *Linguistic Inquiry* 8, 249–336.
- Siegel, D. C. (1970) *Topics in English Morphology*, Doctoral dissertation, MIT, Cambridge, Massachusetts.

*Department of English
University of New Hampshire
Durham, New Hampshire 03824*