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Hindi Stress from the Poet's Perspective

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1. Introduction

Ohala (1977:327), surveying the studies of Hindi stress from the past 100 years, observes that word stress is a controversial issue in Hindi phonology because some people (e.g., Scholberg 1940:14) doubt that Hindi has stress, and linguists do not agree on where it occurs. She criticizes these early studies for being "impressionistic." Her objective in this article is to go beyond intuitive studies and see what modern phonetics equipment can offer for the study of Hindi stress. As a prelude to further instrumental studies, she leads the way with a search for the phonetic correlates of Hindi stress.

The present paper, in contrast, is an investigation of what intuition still has to offer toward a better understanding of Hindi word stress. It is not meant to conclusively settle the issue of stress placement in Hindi, nor to replace instrumental studies. Rather, this is a parallel study to instrumental research currently being done on Hindi stress, and it is hoped that such studies will be able to test the tentative conclusions presented here.

The assumption on which this paper is based is that if Hindi actually does have stress, then speakers of the language should somehow be aware of it, if not consciously, then subconsciously. If linguists are not able to agree on stress placement in Hindi on the basis of their intuition, then is there another group of people within Hindi-speaking society, other than linguists, who are closely in touch with their linguistic subconscious, and whose awareness of stress placement one can tap? What about poets? As Vendryes (paraphrased by Allen 1973:13) says, "Poets put into practice—generally without realizing it, but with a surer instinct than other men—the phonological principles of the language they use."

Following through with this idea, the placement of ictus in samples of poetry was analyzed in the hope that it might provide information on stress. The results of the study suggest that Hindi poets are well aware of stress, and in agreement on where it occurs. It remains for instrumental studies to

determine to what extent the poets' ictus is a reliable indication of word stress in the spoken language.

The questions regarding the existence and placement of word stress in Hindi are due to the fact that stress in Hindi is not nearly as obvious as in a language like English, where stressed syllables are given distinct prominence, contrasting with unstressed syllables, which are considerably reduced. Consistent with this difference, a Hindi speaker cannot as easily pinpoint the stressed syllable in Hindi as can an English speaker in English. This has also made the task of describing stress in Hindi more difficult. In Hindi, as in most languages, traditional linguistic descriptions of stress placement have been based on linguists' intuition. However, in Hindi lack of consensus among linguists regarding stress placement has left the issue unresolved.

2. Stress Rules of Linguists

In this paper I have taken for comparison the five sets of stress rules reviewed by Ohala, those of Grierson (1895), Dixit (1963), Mehrotra (1965), Kelkar (1968), and Sharma (1969), plus one more, Jones (1971). For the most part these can be divided up according to their alignment with one or the other of two conflicting opinions on Hindi stress placement. The clearest statements of these two opinions are given by Grierson and Kelkar. They are as follows:

Grierson's rule (1895:139) is an adaptation of the rule for stress in Sanskrit given by Jacobi (1893:574-575). Grierson presents his rule in the context of historical phonology, and clearly intends it to apply to medieval as well as modern Hindi. He reckons syllables in two weights, "long" and "short," i.e., heavy and light, according to the method used in traditional Hindi poetry. His rule is as follows: "The stress accent falls on the penultimate if it be long... If the penultimate be short, the accent falls on the antepenultimate, provided that be long... In any other case it is thrown back as far as possible—the limits being... in (Indo-Aryan vernacular) words ending in a short vowel, the last syllable but three; and in IAV words ending in a long vowel, the antepenultimate."[1]

Kelkar (1968:26-28), in contrast, deals exclusively with stress in modern Hindi, making no reference to earlier stages of the language. Therefore, to account for differences in behavior between the final syllables in modern Hindi *kartā* "he does" and *bāt* "matter," Kelkar finds it appropriate to define three grades of syllable weight:

light:	(C)V̆
medium:	(C)V̄ or (C)V̆C
heavy:	any other syllable

or what will be referred to in this paper as light ∪, heavy −, and extra heavy ±. His stress rule is: "Find the maximally heavy syllable or syllables. If there is only one maximum, it is tonic... If there are more than one maximum, the last but one out of the maxima is the tonic."

Other rules which have been given for Hindi stress produce results generally similar to one or the other of these two rules, although each individual writer

has a different manner both of defining syllables and of presenting his rules. Therefore, in order to accurately compare the various stress rules, it is clearly necessary to have (1) a common manner of defining syllables and (2) a diagram of all possible syllabic patterns on which to mark the various stress rules.

For the first of these I have chosen Grierson's manner of reckoning syllables, which is the system used in traditional Hindi poetry. This system does have a disadvantage for the analysis of stress in modern Hindi in that it counts certain syllables which are no longer pronounced, though they are generally indicated by the script.[2] For example, it counts as syllables final consonants with their inherent *a*, as in *bāt(a)*, as well as internal syllables which have been lost due to schwa syncopy, as in *kar(a)tā*. However, the modern Hindi word does generally preserve the syllable weight of the syllable that has been lost. Thus, Grierson's recognition of inherent *a* as a separate syllable is equivalent to Kelkar's accounting for it as extra heavy syllable weight.[3] Furthermore, for the present paper an important advantage of Grierson's metrical scansion of syllables is that it allows for comparison between stress in modern Hindi prose and traditional Hindi poetry, which Kelkar's scansion does not. The following are examples of words scanned according to Grierson's and Kelkar's methods:

Grierson: metrical scansion		Kelkar: modern pronunciation	
2 syllable weights:		3 syllable weights:	
bāt(a)	– ∪	*bāt*	±
kar(a)tā	∪ ∪ –	*kartā*	– –

Table 1 fulfills the second requirement, for a standard form on which to mark and compare the variously worded stress rules. Column I, in Grierson's scansion, is a list of the eight possible combinations of heavy and light syllables for the last three syllables of a word. Column II shows how these same syllabic patterns would be scanned in Kelkar's system. Some examples are also given here of cases where two different syllabic patterns in Kelkar's system both fall under one syllabic pattern in Grierson's system. In column III an example is provided of a word of each of the eight syllabic types. Where two different patterns are shown in column II, examples of both are given in column III.

Before beginning a comparison of the six sets of stress rules it is also useful to have an idea of which word lengths make up the bulk of the vocabulary in discourse and which ones occur relatively rarely. This information can then be used to weigh the relative importance of specific differences of opinion among the six writers. For this a sample of typical conversational Hindi was analyzed to establish the relative frequency of different word lengths. The sample consisted of 20 pages of the transcription of the film *Sārā Ākāś(a)* (Chatterji 1980:11-30),[4] a total of 1811 words. Measuring word length in morae (∪ = 1 mora, – = 2 morae), the results were as shown in Figure 1.

Table 1. The 8 possibilities for the last three syllables of a word

I Grierson	II Kelkar	III Modern Hindi word
1. ∪ – ∪	∪ – ∪/∪ ±	*sunīti* "equity"/*rivāz(a)* "custom"
2. – – ∪	– ±	*ādhār(a)* "basis"
3. ∪ – –	∪ – –	*dikhānā* "to show"
4. – – –	– – –	*āzādī* "freedom"
5. – ∪ ∪	– ∪∪/– –	*āhuti* "oblation"/*kīmat(a)* "price"
6. – ∪ –	– ∪ –/± –	*dekhiye* "please look"/*dekh(a)tā* "he sees"
7. ∪ ∪ –	∪ ∪ –/– –	*amitā* a name/kar(a)nā "to do"
8. ∪ ∪ ∪	∪ ∪ ∪/∪ –	*aditi* a name/*kamal(a)* "lotus"

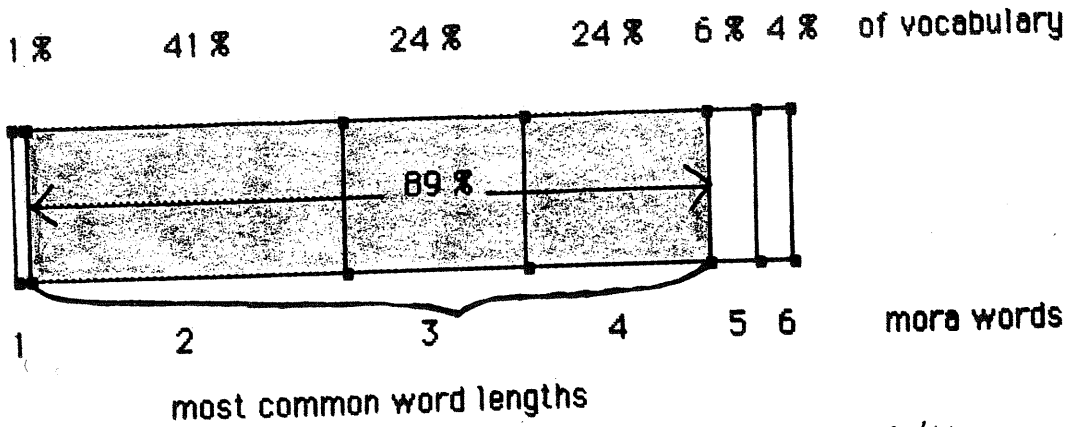

Figure 1. Word length distribution in a 20-page sample of *Sārā ākāś(a)*

As Figure 1 shows, in this sample words of two, three, or four morae made up the bulk of the vocabulary, that is, 89%. Words of more than four morae were relatively rare.[5] Therefore, words of up to four morae will be considered average length, and words of five or more morae longer than average. On this basis the other writers' disagreements with Grierson's rule have been divided into two categories, those that pertain to average length words, and those that pertain to longer words. Table 2 displays the combined stress rules of all six writers for each of the eight syllable types for words of average length.

Table 2. The combined stress rules of all six writers.

Pattern	Grierson's rule			
Group A	1. ∪ ´∪			
	2. – ´∪			
Group B	3. ∪ ´ –		all 6 writers	
	4. – ´ –		in agreement	
	5. ´∪∪			
	6. ´∪ –			
Group C	7. ∪∪ –	Grierson, Mehrotra	7. ∪∪ ´	Kelkar, Dixit, Sharma, Jones
	8. ∪∪∪∪		8. ∪∪∪∪	

As Table 2 shows, for syllabic patterns 1-6, for words of up to four morae in length, all of the writers agree with Grierson's placement of stress. Any disagreements are restricted to words that are longer than average and relatively infrequent.[6]

For syllabic patterns 7 and 8, however, the situation is quite different. Four of the six writers disagree with Grierson, and the difference of opinion involves words of average length and high frequency. This is the basic controversy regarding word stress in Hindi. The situation is as follows:

According to Grierson's rule, in pattern 7, a word with a final heavy syllable and all the rest light, stress falls on the antepenult, or in a two-syllable word of this type, on the initial syllable:

Pattern 7. Grierson:	*ámitā* a name	◡ ◡ –
	kálā "art"	◡ –

In pattern 8, a word with all light syllables, Grierson places stress on the fourth syllable from the end, or in a 3-syllable word of this type, on the initial syllable:

Pattern 8. Grierson:	*ánumati* "approval"	◡ ◡ ◡ ◡
	ádditi a name	◡ ◡ ◡

In both these cases Mehrotra gives examples confirming Grierson's rule.

Kelkar's rule, in contrast, places stress on the final heavy syllable in pattern 7, and on the penultimate in pattern 8. He gives examples, and is supported in this by Sharma, Dixit, and Jones:

Pattern 7. Kelkar:	*amitā́*	◡ ◡ –
	kalā́	◡ –
Pattern 8. Kelkar:	*anumáti*	◡ ◡ ◡ ◡
	adíti	◡ ◡ ◡

In pattern 7 at least, the controversy is partly a question of whether or not stress can fall on a light syllable when there is also a heavy syllable in the word. Grierson says it can. Kelkar says it cannot.

There is one further complication regarding stress in pattern 7, a point mentioned neither by Grierson nor by Kelkar. A few examples have been given of contrastive stress in Hindi in two-syllable words of pattern 7, i.e., ◡ –. As M.A.R. Barker noted (personal communication 1987), these all appear to involve cases of the causative verb stem. Arun (1961:21) gives two examples contrasting noun and causative imperative:

gḍḷā "throat"	◡ –	*galā́* "melt"	◡ –
ghḍṭā "cloud"	◡ –	*ghaṭā́* "decrease"	◡ –

Mehrotra (1965:97) also gives a few examples. Ohala (1977:328) ran a brief test on the pair *gḍlā/galā́*. Her conclusion was that there was no stress difference to distinguish them. However, as her sample was quite small, and a number of people have claimed that these pairs do contrast, it seems that the question might be left open pending a more extensive test.[7]

To summarize, the controversy among linguists regarding stress in Hindi is essentially restricted to two syllabic patterns, namely 7 and 8. With regard to stress in these two patterns, there are two basic opinions, and each of the six writers takes a stand in favor of one or the other. This places Grierson and Mehrotra in one group, opposed to Kelkar, Sharma, Dixit, and Jones in the other.

3. Metrical Rules of Poets

Now, having established what linguists have said regarding stress in Hindi, I will compare this with the intuitions of poets by checking the poets' placement of words vis-à-vis the metrical ictus. In poetry one can generally expect a fairly high correlation between metrical ictus and word stress, because such a correlation is part of what makes poetic language sound natural. However, there is generally not a 100% match between the two. So when taking samples from poetry for information on word stress one must be content with discovering general tendencies and not expect exact statistics.

For this experiment three 50-line samples of traditional Hindi narrative poetry were selected. The main reason for the choice of traditional meters was that they have a completely regular rhythmic beat, or ictus, and there is no mistaking on which syllable it occurs. Another point in favor of traditional meters for this study is that meters which have been in use in a language for some time are likely to be more finely tuned to the speech rhythm of the language than recently borrowed ones which may not yet be completely adapted to their new language environment. Much modern Hindi poetry, in contrast, is composed in new meters without a clearly defined ictus and modelled on modern English metrical forms.

The first two 50-line samples, in the *caupāī* meter, are from 16th century literary epics. One is from the *Rāmacaritamānasa,* or Hindi *Rāmāyaṇa,* composed by Tulasīdāsa (1976:250-253), considered to be one of the two greatest Hindi poets. The other 16th century sample is from *Padamāvata,* a Sufi allegorical poem, written by Malik Muhammad Jāyasī (1963:406-412). The third sample, from the 20th century, but also in traditional style, is from a printed version of the Hindi oral epic *Ālhā* (Miśra 1972:432–434). Its meter is generally referred to as the *ālhā* meter.

The two meters, the *caupāī* and the *ālhā,* are very similar. Both meters are quantitative, the length of a line of verse being measured in morae, not in syllables. Both are composed to an eight-beat line, and in both the ictus falls on the first of every four morae. A line of *caupāī* meter consists of 32 morae, divided into eight four-mora units, each with ictus on its first mora:

(ṁmmm)(ṁmmm)(ṁmmm)(ṁmmm), (ṁmmm)(ṁmmm)(ṁmmm)(ṁmmm).

Though lacking the final mora of the *caupāī, the 31-mora ālhā* meter has the same rhythmic pattern:

(ṁmmm)(ṁmmm)(ṁmmm)(ṁmmm), (ṁmmm)(ṁmmm)(ṁmmm)(ṁmm.).

Two lines of the *caupāī* meter (Tulasīdāsa 1976:250, line 9-10):

(1a) *kŕpā - síndhu*[8] *bolé musukā̃ī,*
(◡́ – Ӿ́ ◡ –)(–́ ◡ ◡)(–́ –),

(1b) *sõī*[9] *karu jĕ̃hiṁ tava nā̃va na jā̃ī.*
(◡́ ◡ ◡ ◡)(◡́ ◡ ◡ ◡)(–́ ◡ ◡)(–́ –).

(2a) *bégi ā̃nu jala pā́ya pakhā́rū,*
(–́ ◡ Ӿ́ ◡ ◡ ◡)(–́ ◡ ◡)(–́ –),

(2b) *hóta biláṁbu utā́rahi pā́rū.*
(–́ ◡ ◡)(–́ ◡ ◡)(–́ ◡ ◡)(–́ –).

Translation:

"Said the Lord of grace with a smile,
'Do so, then, that your boat may not be lost.
Bring water quickly and wash my feet,
for it is late. After that take me across.'" (Hill 1952:202)

Two lines of the *ālhā* meter (Miśra 1972:432, lines 3 and 5):

(1a) *márigā ṭhā́kura sírasā - vā́lā,*
(◡́ ◡ –)(–́ ◡ ◡)(◡́ ◡ –)(–́ –),

(1b) *bípadā gáī mŏ̃hóbe ā́y(a).*
(◡́ ◡ –)(◡́ – ◡)(–́ –)(–́ ◡ .).

(2a) *kó aba jū́jhai pŕthī - rā́ja te,*
(–́ ◡ ◡)(–́ –)(◡́ – Ӿ́ ◡ –),

(2b) *sū́jhai nâhīṁ mandí yaha bā́t(a).*
(–́ –)(◡́ – ◡)(–́ ◡ ◡)(–́ ◡ .).

Translation:

The lord of Sir(a)sā has died.
Distress has beset Mahoba.
Who now will fight against Pṛthvīrāj(a)?
No answer comes to mind.

Each eight-beat 50-line sample provides 400 cases of metrical ictus. However, of the 400 occurrences of ictus in each sample, I took for analysis only those words where a contrast in stress would be possible. Words which in modern Hindi are monosyllables were excluded, i.e., all one- and two-mora words, as well as three-mora words of the pattern – ◡. The remaining words, which are of two or more syllables in modern Hindi, will be referred to as polysyllabic.

What information do the metrical samples provide? To facilitate discussion the eight syllable types of Table 2 have been divided into three groups: group A (patterns 1 and 2), group B (patterns 3-6), and group C (patterns 7 and 8). Table 3 shows the percentage of polysyllabic words in each of the three groups to have ictus fall on the syllable designated by Grierson's rule as carrying stress.

Table 3. Prevalence of ictus on the syllable designated by Grierson's rule as carrying stress.

	Group A	Group B	Group C
Jāyasī	8/100%*	143/92%	94/78%
Tulasī	15/100%	135/93%	93/68%
Ālhā	27/100%	112/82%	115/80%
average:	100%	89%	75%

* Number of words in group/percentage of that number having ictus in accordance with Grierson's rule.

For syllabic group A, where the linguistics are in complete agreement, all three poets wholeheartedly support them, in every single case placing the metrical ictus on the syllable designated by the linguists as carrying the stress.

example: Tulasī *caupāī* (2b): *bildmbu* "delay" ∪ –′ ∪

Similarly, in syllabic group B, where again the six linguists agree, the metrical data coincides with the linguists' rules, though not quite as emphatically. In Tulasīdāsa 93% have ictus on the syllable designated as a stressed by the linguists' rules.

example: (Tulasīdāsa 1976:250, line 14) *pā́vā* "received" –′ –

The remaining 7% register ictus on a single alternate position, namely the syllable containing the second mora from the end of the word.

example: Tulasīdāsa *caupāī* (1a): *bolé* "spoke" – –′

The figures for Jāyasī are nearly identical: In group B, 92% agree with the linguists, while 8% have ictus on the same alternate syllable as in Tulasīdāsa. The figures for *Alhā* are reasonably close also: 82% have the ictus on the syllable designated by the linguists. In the remaining 18% ictus falls on the same alternate syllable as in Jāyasī and Tulasīdāsa. Thus far, for syllabic groups A and B, where the linguists are in complete agreement regarding stress placement, the poets support them by choosing that same syllable as the most appropriate one to carry the ictus.

What then about words of Group C, where the linguists present two conflicting opinions? Here the poets are slightly less partial, but they nonetheless take a definite stand. Of the examples of syllabic group C in Tulasīdāsa 68% agree with Grierson's rule, 32% are in the alternate ictus position two morae from the end of the word, a score of approximately 2 to 1 in favour of Grier-

son. In Jāyasī there is slightly more agreement, with 78% for Grierson, 22% in the alternate ictus position, or about 3 to 1. The *Ālhā* figures show even more support for Grierson, with 80% versus 20%, or a score of 4 to 1. In each of the samples, in group C the alternate ictus position coincides with the syllable which Kelkar designates as stressed.

examples: (Tulasīdāsa 1976:250, line 11)

supporting Grierson:	*utarahiṁ* "they cross'	◡ ◡ ◡ ◡
supporting Kelkar:	*sumirata* "remembering"	◡ ◡ ◡ ◡

From the above one may note the following: Although Jāyasī and Tulasī belonged to two different religious traditions, and were both separated from *Ālhā* by nearly four centuries, the statistics from the three samples of poetry are remarkably similar. In spite of so called poetic license, for each of the eight syllable types there is one primary ictus pattern, with at most one possible alternate pattern. All three poets invariably made the same choices of primary and alternate ictus patterns for each of the three syllabic groups. In all cases the primary ictus pattern was in conformity with Grierson's stress rule, while the alternate ictus pattern was two morae from the end of the word. For controversial group C the alternate ictus pattern coincided with the syllable on which Kelkar placed stress.

This suggests the following conclusions: (1) that different poets composing poems widely separated in both time and space had a nearly identical intuitive feel for stress placement in their poetry and (2) that the poets' choice for stress placement can best be described by Grierson's rule. However, one must reserve judgment, as it is not entirely clear to what extent these poetic samples are a reliable indicator of stress in the spoken language.

To summarize, all six linguists and three poets agree on the placement of stress as it is marked in table 2 for syllabic patterns 1 through 6, (groups A and B). With regard to stress in patterns 7 and 8, (group C), however, there is a controversy among the linguists. Kelkar, Sharma, Dixit, and Jones hold one view, which conflicts with the view held by Grierson and Mehrotra. In addition a few examples have also been given of contrastive stress in two-syllable words of group C. The data from the metrical study clearly favor Grierson over Kelkar.[10] However, even the metrical statistics seem to indicate a less firm opinion on the part of the poets regarding group C than groups A and B. Therefore, while Grierson appears to be in the lead, the issue of stress in group C is still not completely resolved.

3. A New Interpretation of Hindi Stress

Now, having established as definitely as possible from the linguistic descriptions and metrical data where stress falls in Hindi, I would like to offer a new way of interpreting this information. All of the linguists have defined stress placement in terms of two variables, syllable weight and number of syllables. Is this necessary? What if instead of counting syllables one counts morae? After all, the concept of mora combines both syllable count and syllable weight.

If one redesigns Table 2 to display Grierson's rule in terms of morae from the end of the word (see Figure 2) an interesting pattern emerges, which was not evident from Table 2.

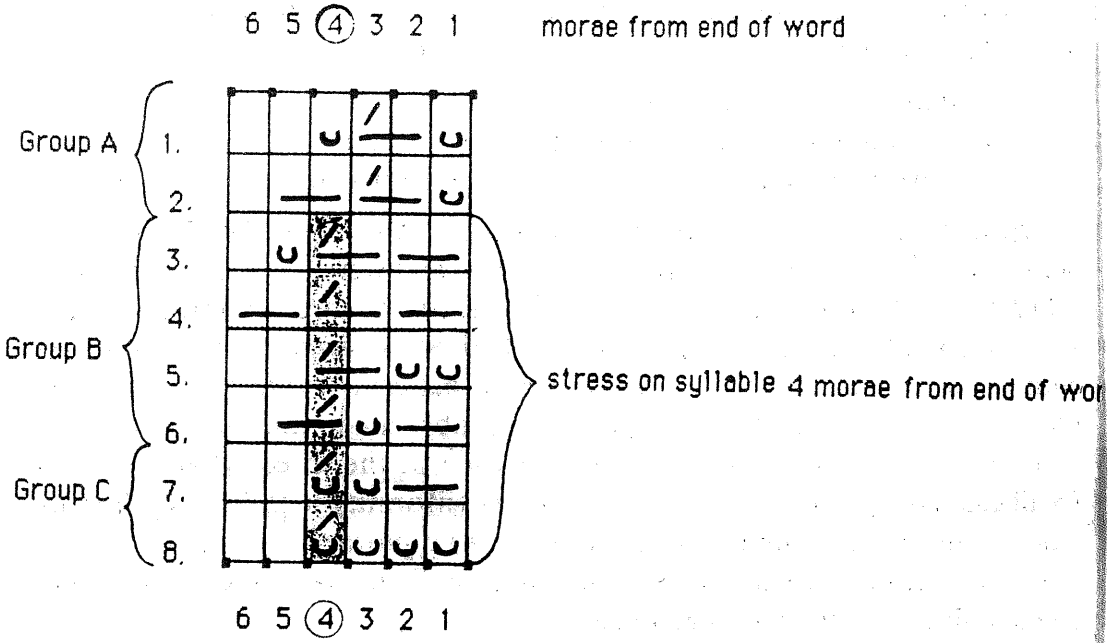

Figure 2. Grierson's stress rule in terms of morae.

As Figure 2 shows, according to Grierson's rule, in every single syllabic pattern in groups B and C, that is, in six of the eight syllabic patterns, stress falls on the syllable which contains the fourth mora from the end of the word. It is only words of syllabic group A that do not take four-mora stress. Because of this I suggest that Grierson's rule be restated as follows: A word ending in $-\cup$ takes stress on the penult. Otherwise stress falls on the syllable which contains the fourth mora from the end of the word. In a word of less than four morae, stress approximates to that position and falls on the initial syllable.

This restatement of Grierson's rule in terms of morae then brings up the question: What proportion of words in discourse fall into this new "otherwise" category and have stress on the syllable containing the fourth mora from the end of the word? To answer this question: table 4 shows the percentages of polysyllabic words in each syllabic group for each sample of poetry, plus the *Sārā ākāś(a)* sample, and a short taped spontaneous story in colloquial modern Hindi[11].

Subtracting the small percentage of words of group A in the modern prose samples, one arrives at the percentage of words with four-mora stress, if Grierson's rule is taken as the standard. In the *Sārā ākāś(a)* sample, and in the short taped story, words with four-mora stress made up 96% and 97% respectively of polysyllabic words. In the samples of poetry there is a question as to how to interpret the statistics. The conservative approach is to take the statistics for the percentages of words which actually occur with four-mora stress. Those statistics are as follows: Jāyasī 85%, Tulasī 78%, and

Table 4. Percentage of polysyllabic words of each syllable group in each sample.

	Group A	Group B	Group C	Total polysyllabic words
Jāyasī	3%	58%	38%	245
Tulasī	6%	56%	38%	243
Ālhā	11%*	44%	45%	254
Story	3%	68%	29%	187
Sārā Ākāś(a)	4%			905

*The relatively higher figure of 11% in the *Ālhā* sample is due to the fact that the *ālhā* meter requires words of syllabic group A (i.e., ∪ – ∪, or – – ∪) to end the metrical line, e.g., *bāt(a)* "matter" – ∪ in the example above of *ālhā* meter.

Ālhā 72%. On the other hand, if one takes the poets' primary ictus pattern for each syllabic group as a statement that stress in the spoken language falls on that syllable, then the poetic samples might be treated in the same manner as the modern prose samples: the percentage of words with four-mora stress being calculated by subtracting the percentage of words of group A from the total. The figures thus calculated would of course be considerably higher.

If these samples are representative of the language in general, and Grierson's rule is correct, then it is clear that the majority of polysyllabic words in discourse have a four-mora stress pattern.[12] This allows for a very simple statement of the predominant stress pattern in Hindi: Stress falls on the syllable containing the fourth mora from the end of the word. In a word of less than four morae, stress approximates to that position and falls on the initial syllable.

This then raises a second question: Are there also a large proportion of words with initial stress? According to Grierson's rule, in none of the syllabic groups (A, B, C) can stress fall further than four morae from the end of a word. As has already been noted (see figure 1), only a small percentage of words are longer than four morae. What percentage of words, then, have initial stress? In the *Sārā ākāś*(a) sample, by Grierson's rule, 79% of polysyllabic words have initial stress. This is a slightly lower figure than the 96% of words with four-mora stress, but it is certainly a large enough percentage to be taken into consideration in describing a predominant stress pattern. It would seem, then, that the predominant stress pattern should be described as simultaneously four-mora stress and initial stress. From this one could then abstract a four-mora word with initial stress as the model word: (ṁmmm).

What then are the precedents for describing stress placement according to mora count? Stress has been stated in terms of morae for several American Indian languages, for example, Delaware (Voegelin 1946: 137). Among more well-known languages a reformulation of the stress rule in terms of morae has also been given for Latin. The traditional form of the Latin stress rule is very similar to Grierson's rule for Hindi stress. Allen (1973:155) quotes

the Latin stress rule as given by Kent (1932:66): "A long penult was accented ... but if the penult was short, the antepenult received the accent. . . . Disyllables were necessarily accented on the penult." Jakobson (1937:259) suggested a simplification of this rule in terms of morae. Allen (1973:161–162) quotes Jakobson's rule in translation: "[In words of 2+ syllables] the accent falls on the syllable which contains the second mora from the end of the word excluding the final syllable." Allen criticizes Jakobson's reformulation in morae on the grounds that there is insufficient phonological justification for this in Latin.

In Hindi, however, there seems to be ample justification for using the concept of the mora to describe stress placement. There are a number of indications that a four-mora unit has been significant from a linguistic point of view in the history of the Hindi language. A convincing argument for the mora in Hindi phonology is presented by Miranda (1985) in a discussion of compensatory lengthening. As Miranda (1985:94) says, at one stage in the history of the Hindi language, geminates and homorganic nasal consonant clusters were simplified to single consonants, and the preceding vowel was compensatorily lengthened. Previous to Miranda's article the environment in which compensatory lengthening did and did not occur had not been satisfactorily specified. Miranda (1985:91) offers the concept of "temporal compensation at the word level" as a way of concisely and completely specifying the environment in which compensatory lengthening occurred. His rule is as follows (p. 99): "When the following consonant was simplified, a short vowel in the initial syllable was lengthened in words which did not exceed four morae in length." As Miranda says, his rule could be stated in terms of syllables and syllable weight, but it can be expressed much more simply in terms of morae. Here are a few of Miranda's examples (1985:94-97) to demonstrate how his rule works:

A) Compensatory lengthening occurred in the initial syllable of a word of four morae or less:

(3 morae) *cā̆nda* "moon" > *cā̆nd(a)*[13]
(4 morae) *mi̇ṭṭhā* "sweet" > *mīṭhā*

B) Compensatory lengthening did not occur in non-initial syllables:

(5 morae) *kevā̆ṭṭa* "fisherman" > *kévaṭ(a)*

C) Compensatory lengthening also did not occur in the initial syllable of words longer than four morae:

(5 morae) *cammā̆ra* "shoemaker" > *camā̆r(a)*
(8 morae) *kaṭṭhapu̇ttalī* "puppet" > *kaṭh(a)pu̇t(a)lī*
(5 morae) *u̇ttarai* "descends" > *u̇t(a)re*

This demonstration of Miranda's of temporal compensation in Hindi based on a four-mora norm is evidence of the significance in Hindi phonology both of the mora as a concept and of a four-mora unit as a psychological reality.

Curious if there might be a relationship between Miranda's four-mora temporal compensation unit and the four-mora portion of Grierson's stress rule, I applied Grierson's rule to the Middle Indic forms of all Miranda's examples. My tentative conclusion was as follows: It was when stress (which was four

morae or less from the end of the word) coincided with the initial syllable that compensatory lengthening occurred. I have not tested this out beyond the examples in Miranda's article. However, the conditioning in Grierson's and Miranda's rules appears so well matched that it seems quite possible that the two rules did actually work hand in hand. If this is true, then in the compensatory lengthening/temporal compensation phenomenon in Hindi we have again not merely a four-mora unit of length, but a four-mora unit beginning with stress: (ṁmmm). This four-mora unit seems to function here as some kind of abstract word model, in which longer words were trimmed down to imitate.

The linguistic significance of a four-mora unit in Hindi shows up in another way also, perhaps as a result of the process of temporal compensation described by Miranda. In the five samples analyzed for the present paper (the samples of Jāyasī, Tulasī, *Ālhā, Sārā Ākāś(a),* and the taped story), it appears that four morae mark a word-length threshold beyond which word frequency is drastically reduced (see table 5). Taking statistics from the five samples, roughly 90% of the words in an individual text are of four morae or less in length, and this 90% is divided approximately into equal portions of two-, three-, and four-mora words. In contrast, five-mora words are relatively infrequent. For example, in the longest sample, from Sārā Ākāś(a), there are four times more four-mora words than five-mora words.

Table 5: Percentages of words of different lengths in morae

	1m	2m	3m	4m	5m	6m	total words
Jāyasī	6%	29%	33%	26%	5%	2%	512
Tulasī	1	33	33	23	8	2	509
Ālhā	0	26	29	32	12	1	454
Sārā Ākāś (a)	1	41	24	24	6	4	1811
story	3	41	21	27	5	3	384
		most common word lengths					

Further evidence for the mora in Hindi phonology is the following: As Watkins (1963:218) says, "The formal characteristics of a verse form are dictated by the structural features of the prosody of the language." Thus it may also be linguistically relevant that the traditional Hindi metrical system is not syllabic, but is quantitative, that is, the length of a line of verse is measured in morae. In addition, the pervasiveness of the four-mora rhythmic unit in poetry seems significant. This is the basic rhythmic unit to which all traditional Hindi narrative meters and most lyric meters have been composed. An important pattern long before the Hindi period, it has been the dominant rhythmic unit in poetry for a millennium.

4. Conclusion

There has been a controversy among linguists regarding stress placement in Hindi, opinion being divided between supporters of Grierson's rule on the one hand, and those of Kelkar's rule on the other. In this paper the Hindi poet was brought in as an arbitrator. A study was made of the ictus in Hindi poetry to see if the poets' intuitive sense of language rhythm might provide insight into the Hindi stress question.

The results were as follows: All three poets sampled were in agreement on placement of the ictus in all syllable types. For each syllable type there was one primary ictus position and at most one alternate position. In all cases the primary ictus position coincided with the stressed syllable as determined by Grierson's rule. These statistics suggest that Grierson's rule best describes stress placement in Hindi.

However, there were a number of empirical problems in the study. The samples were small and they were of medieval Hindi dialect rather than modern Hindi, and of stylized poetry rather than normal speech. Therefore, there is some question as to to what extent the issue of stress in modern Hindi can be validly argued on the basis of the metrical data from this study. So the controversy is still not completely resolved. Instrumental tests need to be run on modern spoken Hindi to see whether or not they reconfirm the poets' choice of Grierson's rule for stress in Hindi.

Another point brought out by this study is the repeated occurrence in Hindi of a four-mora unit. A word count indicated that four morae forms a word-length threshold beyond which word frequency is notably reduced. In addition to this, two other independent occurrences in Hindi of a four-mora unit were mentioned: Miranda's four-mora temporal compensation unit, and the four-mora rhythmic unit of Hindi poetry.

If Grierson's rule is indeed correct, then these sporadic occurrences of a four-mora unit combine to form a meaningful overall pattern: It was demonstrated by a rewording of Grierson's rule in terms of morae that he actually prescribes a four-mora stress pattern for most syllable types. If Grierson's rule is then combined with the four-mora word-length threshold, this seems to produce a predominant stress pattern in Hindi which is simultaneously four-mora and initial stress: (ḿmmm). Similarly, if one looks at Grierson's rule in conjunction with Miranda's temporal compensation rule, this seems to indicate that compensatory lengthening might have occurred when four-mora stress coincided with the initial syllable: (ḿmmm). It is impossible then not to note the similarity between these two four-mora rhythmic units and the four-mora rhythmic unit that is so pervasive in traditional Hindi poetry: (ḿmmm). It is certainly tempting to think that it is the existence of this four-mora pattern as a dominant speech rhythm in Hindi that served as the model for the basic rhythmic unit of Hindi poetry. It remains for instrumental studies to determine if this is so.

NOTES

1. This system of reckoning syllables does not recognize final consonants in Hindi. Thus Grierson can categorize all final syllables as those ending in either a short or a long vowel.

2. That is, in the sense that all *devanāgarī* consonants theoretically consist of consonant plus *a* unless specifically marked otherwise. Here (*a*) denotes an *a* which is not pronounced in modern Hindi but is recognized as a syllable by Grierson.

3. In the few cases where Grierson's scansion of a word might cause misunderstanding, a second scansion of the word in Kelkar's three grades of syllable weight has also been given.

4. From the transcription the editor's comments were deleted, as well as a few cases of whole phrases or sentences in English.

5. See table 5 for further confirmation of this.

6. The following is a list of disagreements with Grierson's stress rule for words of more than four morae. The list was composed by the logical application of the rules of each writer. In some cases the writer has himself given an example of a particular syllabic pattern to confirm his intention. However, in cases where no example was given, it is possible that the theoretical implication of the rule was not intended. When an exception was supported by the writer with an example I have specifically mentioned this, except in the case of Dixit, whose stress rule I only have from Ohala (1977:330).

Pattern 1. The rules given by Kelkar, Dixit, and Jones place stress on the second to last heavy in the following case: ˊ ∪ – ∪ (= Kelkar ˊ ± ±). Kelkar gives the example: *sáṃskār(a)* "ritual."

Pattern 2. Kelkar's and Jones' rules call for: ˊ – ∪ (= Kelkar ˊ – ∪) [as in Váidehi (voc.) "Sītā"].

Dixit's and Jones' rules additionally call for: ˊ – ∪ (= Kelkar ˊ ±) [as in *békār* "useless"].

Pattern 3. Kelkar's rules call for stress on the extra heavy syllable in the pattern ˊ ∪ – – (= Kelkar ˊ ± – –). He gives the example:
rézgārī "small change" ˊ ∪ – – (= Kelkar ˊ ± – –).

Pattern 5. Jones' rule calls for: ˊ – ∪ ∪.

General: Patterns 1-6. In addition to the above, Kelkar's rules would theoretically place stress (1) on a heavy syllable, with one other heavy and any number of light syllables following: ˊ ∪ ∪ – ... ∪ ∪ ∪, and (2) on an extra heavy syllable with one other extra heavy syllable and any number of heavy and light syllables following: ˊ ∪ – ∪ ... ∪ – ∪ – ∪ (= Kelkar ˊ ± – ∪ ... ∪ – ∪ ±).

Patterns 7 and 8. There is also some controversy regarding stress placement in longer words of syllabic patterns 7 and 8. Grierson's rule does not allow stress to go beyond the antepenultimate in a word ending in a heavy syllable, or the fourth syllable from the end in a word with all light syllables. But Kelkar, Sharma, Dixit, and Jones put no limit on how far from the end of the word stress may fall, as long as it falls on a heavy syllable:

Pattern 7. ˊ ∪ ∪ ... ∪ ∪ –

Pattern 8. ˊ ∪ ∪ ... ∪ ∪ ∪ ∪

Mehrotra allows stress in syllabic patterns 7 and 8 to go as far as the initial syllable, if no heavy syllable comes first (scanning the word from right to left).

Even Grierson (1895:140), in spite of his rule, says that in some people's pronunciation, words with stress on the antepenultimate retain stress on that same syllable when a secondary ending is added, though others shift the stress to the new antepenultimate. He gives the example *titáliyāṁ* "butterflies" ∪ ∪ ∪ – ~ *ti'taliyāṁ* ∪ ∪ ∪ –. An example of this type of word is also given by Mehrotra, showing initial stress: *bándariyā* "female monkey" ˊ ∪ ∪ –

Other than these two words, the only examples given by any of the six writers to show stress for patterns 7 and 8 coming further from the end of the word than Grierson's rule allows occur in compound words.

7. See also note 12.

8. Occasionally there are syncopations in the metrical rhythm, as with the syllable *sin*, and a heavy syllable actually spans the boundary between two four-mora rhythmic units. This is not a problem for the present paper, however, because there is no question which syllable the ictus falls on.

9. At times *o* and *e* must be scanned as light for the sake of the meter. Where this occurs it is marked with ∪ above the vowel: e.g., *s̆oi, jĕhiṁ*.

10. My own impression about group C is also that stress generally falls as Grierson describes, but see also note 12.

11. This is a story told by Dr. Kirtilata Datt of the Central Hindi Institute, Agra.

12. Another point in favor of a four-mora stress pattern I am relegating to a note as it is based only on my own perception of Hindi stress: This four-mora accentual unit appears frequently to go beyond the limits of the word to include the word plus enclitics. Thus certain periphrastic verbal constructions, when taken as a unit, may show a four-mora stress pattern, while their individual components do not: e.g., perf.trans./causative compound verb: *gír̄diyā* "he threw down" ∪ ⏑ ∪ – has four-mora stress as a complete unit, although the verb stem portion of this construction, *girā́* ∪ ⏑, which does not occur alone (in this usage), does not have four-mora stress.

Contrasting with such periphrastic forms, the simple verb, when occurring as a complete verbal construction by itself, nearly always shows a four-mora stress pattern: e.g., perf.intrans,: *gír̄ā* "he fell" ∪ –.

The imperative singular of causative verbs (= the verb stem, e.g., *girā́* "throw down" ∪ ⏑), is possibly the only verbal form without four-mora stress which can occur alone, which is perhaps why it is cited in examples of contrastive stress. However, even this imperative form probably occurs more frequently as a compound verb, and thus with four-mora stress for the complete verbal construction (e.g., *girā́ de* "throw down" ∪ ⏑ –). If this analysis is correct it could account for a number of apparent contradictions to Grierson's rule within the framework of the four-mora stress pattern.

13. Transliteration and stress marks are mine.

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