



## The Oxford Handbook of Language Prosody

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### CHAPTER

## 21 The Indian Subcontinent

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### Abstract

This chapter provides brief descriptions of the basic intonational tunes and phrasing properties of some of the Indo-Aryan languages, including Bengali, Marathi, and Assamese, and also touches upon Dravidian languages such as Tamil and Telugu. The crucial issues governing the basic morphology of TUNES include the expression of focus, question prosody, the possibilities of neutral prosody, and phrasing, including its role in the expression of focus. One of the crucial cross-linguistic issues that is addressed relates to the presence or absence of H toned pitch accents and boundary tones related to questions. Some Indian languages show a mixture of H and L tones as well as critical phrasing patterns which suggest that phrasing may play a bigger role than one might be led to think on the basis of other Indo-European prosodic systems.

**Keywords:** Indo-Aryan, Dravidian, intonational tunes, phrasing properties, focus, pitch accents, boundary tones

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## 21.1 Introduction

THE Indian subcontinent comprises Bangladesh, India,<sup>1</sup> and Pakistan, and its languages come from five major language families: Indo-Aryan, Nuristani branches of Indo-Iranian, Dravidian, branches of Austroasiatic, and numerous Tibeto-Burman languages, as well as language isolates (Grierson 1903/1922; Masica 1991; Krishnamurti 2003; Thurgood and LaPolla 2003; Abbi 2013; Dryer and Haspelmath 2013). In general, the term ‘prosody’ subsumes quantity contrasts, metrical structure, lexical tone, phrasing, and intonation, but, as far as is known at present, the only language of the Indian subcontinent to have lexical tone is Punjabi. In this chapter, we touch on all of these aspects of prosody but discuss quantity only insofar as it is linked to stress, phrasing, and intonation. It is not possible to cover the entire range of existing languages; rather, we give representative examples, largely from Assamese, Bengali (Kolkata), Bangladeshi Bengali (Dacca), Hindi, Malayalam, Tamil, and Telugu.

## 21.2 Quantity

From a prosodic perspective, quantity contrasts are pertinent since they are directly related to syllable weight and hence stress assignment. Vowel quantity is always relevant to stress in a quantity-sensitive system, but if geminates are truly moraic and add weight to the syllable (cf. Hayes 1989a), they too could attract stress.<sup>2</sup> For our purposes, it is worth noting that consonant quantity contrasts prevail in most Indo-Aryan languages, while true vowel quantity distinctions are less frequent, a possible example being educated standard Marathi, for which Le Grézaux (2015) reports a quantity contrast for high vowels, with no geminates. ↵ There is, however, a tense/lax distinction in vowels in most of the Indo-Aryan languages, and Masica (1991) provides the following details. Some languages have an eight-vowel system, as in Gujarati /i e ε a ə ɔ o u/, while others are assumed to contain nine vowels, such as Dogri /i ɪ e æ a ə ɔ o u/<sup>3</sup> with three long vowels. Hindi has an additional vowel, but without the quantity distinctions: /i ɪ e æ a ə ɔ o u ʊ/, which is also the view held by Ohala (1999). In the Bengali vowel system, there is neither a lax/tense nor a quantity distinction: /i e æ a ɔ o u/ (Lahiri 2000), but allophonic vowel lengthening occurs in monosyllabic words. Consequently, vowel quantity alternations can be observed in morphologically related (base vs. suffixed) words as well as across unrelated monomorphemic words, as in (1).

(1)

### Vowel quantity alternations in Bengali

|        |        |   |         |                   |
|--------|--------|---|---------|-------------------|
| [nɑ:k] | ‘nose’ | ~ | [nak-i] | nose-ADJ, ‘nasal’ |
| [ka:n] | ‘ear’  | ~ | [kana]  | ‘blind’           |

As in most languages where consonantal quantity contrasts exist, singleton–geminate pairs are observable medially but not finally or initially. In most Indo-Aryan languages, almost all consonantal phonemes have geminate counterparts, but there may be language-specific constraints on their appearance. Hindi, Telugu, and Bengali allow geminates to appear only in medial position, and there are further segmental restrictions. In Hindi, /bʰ tʰ h ɳ/ do not geminate (Ohala 1999), while in Telugu /f ʂ ʃ h ɳ/ are always singletons (Bhaskararao and Ray 2017). Bengali does not allow /h/ to geminate; however, there are also constraints on singletons such that retroflex /ɖ ɖʱ/ are not permitted in word-medial position where they are rhotacized. Examples of monomorphemic word pairs with a subset of obstruent and sonorant phonemes are given in (2) for Bengali, Hindi, and Telugu.

(2)

## Selected examples of singleton–geminate obstruents and sonorants

## a. Bengali

|           |              |            |                 |                                              |
|-----------|--------------|------------|-----------------|----------------------------------------------|
| [at̪a]    | 'wheat'      | [at̪:a]    | 'eight o'clock' | voiceless unaspirated retroflex stop         |
| [ʃob̪h̪a] | 'beauty'     | [ʃob̪h̪:o] | 'civilized'     | voiced aspirated labial stop                 |
| [ɔg̪ad]   | 'plenty'     | [ɔg̪:æn]   | 'faint'         | voiced unaspirated velar stop                |
| [bat̪ʰa]  | 'to isolate' | [bat̪ʰ:a]  | 'child'         | voiceless aspirated palatoalveolar affricate |
| [ʃod̪ʒa]  | 'straight'   | [ʃod̪ʒ:a]  | 'bedding'       | voiced unaspirated palatoalveolar affricate  |
| [kan̪a]   | 'blind'      | [kan̪:a]   | 'tears'         | dental nasal                                 |
| *[d]      | —            | [bɔd̪:o]   | 'too much'      | voiced unaspirated retroflex stop            |

## b. Hindi (Ohala 1999: 101)

|           |             |            |                     |                                                |
|-----------|-------------|------------|---------------------|------------------------------------------------|
| [pəʈa]    | 'address'   | [pəʈ:a]    | 'leaf'              | voiceless unaspirated dental stop              |
| [kəʈ̪h̪a] | 'narrative' | [kəʈ̪h̪:a] | 'red powdered bark' | voiceless aspirated dental stop                |
| [gəɖa]    | 'mace'      | [gəɖ:a]    | 'mattress'          | voiced unaspirated dental stop                 |
| [bət̪ʃa]  | 'save'      | [bət̪ʃ:a]  | 'child'             | voiceless unaspirated palatoalveolar affricate |
| [pəka]    | 'to cook'   | [pək:a]    | 'firm'              | voiceless unaspirated velar stop               |

## c. Telugu (Bhaskararao and Ray 2017: 234)

|        |                 |          |               |                                      |
|--------|-----------------|----------|---------------|--------------------------------------|
| [gɛdi] | 'room'          | [gɛd̪:i] | 'throne'      | voiced unaspirated dentalveolar stop |
| [ɐʈu]  | 'that side'     | [ɐʈ̪:u]  | 'pancake'     | voiceless unaspirated retroflex stop |
| [mogɐ] | 'male'          | [mog̪:ɐ] | 'bud'         | voiced unaspirated velar stop        |
| [kenu] | 'give birth to' | [ken̪:u] | 'eye'         | alveolar nasal stop                  |
| [kelɐ] | 'dream'         | [kel̪:ɐ] | 'falsehood'   | alveolar lateral approximant         |
| [mɛri] | 'again'         | [mɛr̪:i] | 'banyan tree' | alveolar trill                       |

p. 318 Concatenation of identical phonemes leads to geminates, but gemination as a phonological process occurs quite commonly within and across words and across morphemes via assimilation processes. Such assimilations are restricted to specific prosodic domains, as we will see in §21.3). The examples in (3) illustrate this point.

(3)

## Gemination

## a. Concatenation

|         |                          |   |                        |                        |
|---------|--------------------------|---|------------------------|------------------------|
| Bengali | /k <sup>h</sup> el-l-am/ | > | [k <sup>h</sup> el:am] | 'play-SIMPLE PAST-1PL' |
|         | /ʃat̪ ʈola/              | > | [ʃat̪:ɔla]             | 'seven floors'         |

## Marathi Glide gemination (Pandharipande 2003: 725)

|  |              |   |             |                   |
|--|--------------|---|-------------|-------------------|
|  | /nəu-wadzta/ | > | [nəwwadzta] | 'at nine o'clock' |
|  | /nahi-jet/   | > | [nahj:et]   | 'does not come'   |

## b. Derived via r-CORONAL ASSIMILATION, whereby /r/ assimilates completely to the following dental, palatoalveolar, and retroflex consonants, leading to geminates.

|         |            |   |            |                         |
|---------|------------|---|------------|-------------------------|
| Bengali | /kor-ʈ-am/ | > | [koʈ̪:am]  | 'do-HABITUAL PAST-1PL'  |
|         | /t̪ʰor̪di/ | > | [t̪ʰoʈ̪:i] | 'youngest older sister' |

There is another form of gemination that relates to emphasis and is marked by the gemination of a consonant. This is very clearly observed in Bengali time adverbials, as in (4).<sup>4</sup>

(4)

## Adverbs and emphatic germination

Bengali<sup>4</sup>

[æk<sup>h</sup>on]

‘now’

[ek<sup>h</sup>:uni]

‘immediately’

[tɔk<sup>h</sup>on]

‘then’

[tɔk<sup>h</sup>:uni]

‘right after that time’

Thus, geminates and gemination are typologically quite frequent in the Indo-Aryan languages (cf. Goswami 1966 for Assamese). However, although geminates may add weight to the preceding syllable, it does not necessarily follow that they play an active role in stress assignment, to which we turn in the next section.

## 21.3 Word stress

p. 319

Word stress is a contentious topic in the Indo-Aryan languages. In Bengali, for example, lexical prominence is on the first syllable of a word, but it is considered to be phonetically ‘weak’ and hardly perceptible (Chatterji 1926/1975; Hayes and Lahiri 1991; Masica 1991). Nevertheless, there are some clear diagnostics, largely post-lexical, for the location of the main prominence on a word (see also Khan 2016 for Dacca Bengali). For example, as mentioned in §20.2., there are seven oral vowels /i e æ a ɔ o u/ in Bengali and all of them have a nasal counterpart. However, there are distributional constraints on the vowels based on stress. First, the vowels /ɔ/ and /æ/ only occur in word-initial position, as in [kɔt̪ʰa] ‘speech’, [bæt̪ʰa] ‘pain’. In contrast, plenty of examples exist with final /i e u o a/, such as [pori] ‘fairy’, [bēt̪ʰe] ‘short (in height)’, [d̪ʰaṁu] ‘metal’, [bɔt̪ʰo] ‘large, big’, [kɔla] ‘banana’. Second, since all nasal vowel phonemes must be in stressed position, they are restricted to the first syllable of a word. Third, geminate consonants in monomorphemic words are also restricted to the stressed syllable: [ʃot̪ʰi]; \*CVCVC:V words are not permitted. However, since geminate suffixes exist, they are permitted in non-initial syllables in polymorphemic words: /ɔækt̪ʰ-a-t̪ʰ:-e/ show-CAUS-PROG-3SG, ‘(s)he is showing’; /marat̪ʰ:ok/ ‘deadly’. As we shall see in §21.4., the alignment of pitch accents in intonational tunes is another indicator of the syllable that carries the main prominence.

A further diagnostic is the adaptation of loans. From the seventeenth century onwards, and more so in the eighteenth and nineteenth centuries, numerous loans came into Bengali primarily from Portuguese and English, both of which can have words with non-initial and variable stress. Irrespective of the stress pattern of the donor language, Bengali has always borrowed words with main prominence on the first syllable. Portuguese *estirar*, *ananás*, *alfinète*, *espáda*, *bálde*, *janélla* have been borrowed into Bengali as [‘iṣṣiri] ‘iron (for ironing clothes)’, [‘anarɔ] ‘pineapple’, [‘alpin] ‘pin’, [‘iṣpaṁ] ‘steel’, [‘baṁi] ‘bucket’, [‘ɔanla] (Lahiri and Kennard 2019). Irrespective of which syllable bore stress in Portuguese, Bengali has firmly maintained word-initial stress. The same occurs for English words: *exhibítion*, *inspéctor*, *América*, *cómpany* are pronounced as [‘egɔibiʃan], [‘inʃpekt̪ʰɔr], [‘æmerika], [‘kompani]. As Chatterji (1926/1975: 636) puts it, ‘the stress is according to the habits of Bengali’.<sup>5</sup>

Other dialects of Bengali and related sister languages such as Oriya do not necessarily have fixed word-initial stress. Masica (1991: 121) claims that stress is more evenly spaced and is weak (see also Lambert 1943; Pattanayak 1966). In Hindi, stress is probably quantity-sensitive and tends to fall more on the penultimate syllable if the syllable is closed or if the vowel is tense, else the antepenult, very similar to Latinate stress. Names can provide good comparative evidence. For example, the name *Arundhati* carries antepenultimate stress in Hindi [əˈrunɖʰəṁi] but not in Bengali, where the stress is on the first syllable [‘orunɖʰəṁi]. However, there are language-specific differences as to which types of syllables contribute to weight and therefore attract stress. As Masica (1991: 121) states, ‘each language has its own peculiarities: Hindi *gaˈrīb*; *nukˈsān* ‘poor’; ‘loss’ vs. Gujarati *ˈgarib*, *ˈnuksān*. Thus, for intonation purposes, it is important to consider whether the pitch accents are aligned to stressed syllables and whether there is more variation in some languages than others.

## 21.4 Tone

Punjabi tone arose from a merged laryngeal contrast in consonants, and the tone contrast only appears in that segmental context and most clearly in stressed syllables (Evans et al. 2018). On the basis of this segmental origin, the steeply falling tone should be expected to be a low tone, because it appears after historically voiced aspirated plosives (i.e. murmured), while the other tone is low and flat but should be expected to be high, as it appears after the plosives that historically had no breathy voice (voiceless unaspirated, voiceless aspirated, and plain voiced) (cf. §3.3.2).<sup>6</sup> The authors propose that this apparent anomaly is to be explained by a perceptual enhancement of an original low tone after murmured plosives by a fall before it ('dipping'; cf. §9.5.2). The low pitch for the tone after the other laryngeal groups must subsequently have arisen by a contrast-enhancing lowering of an original high tone.

## 21.5 Intonation and intonational tunes

In this section we will discuss three nuclear TUNES: the declarative (neutral), focus, and YES/NO question contours. The standard TUNE in Indo-Aryan languages is overwhelmingly LH. It not only marks focus but is also the general prenuclear contour. Another general fact is that plateaux are not common in Indian languages, which must be related to the fact that the Obligatory Contour Principle (OCP) prohibits the occurrence of a sequence of identical tones in the intonational phrase (IP). Beyond that, there are various interactions between the three intonational tunes in these languages. Three specific issues arise from a brief survey:

1. Are the focus TUNE and the neutral TUNE identical, and, regardless of whether they are, do they differ in pitch range?
2. How reliably can one distinguish a non-focused YES/NO question from a narrow-focused one?
3. If the TUNES of non-focused and narrow-focused YES/NO questions are neutralized, might there still be phrasal segmental processes that can distinguish them?

We next illustrate the various patterns, with examples from Bengali, Assamese, and Hindi. What these languages have in common is that focus is marked by a  $L^*H_p$  contour, with  $L^*$  associated to the earliest stressed syllable of the focused element. As for the neutral contour, Hayes and Lahiri (1991) and Lahiri and Fitzpatrick-Cole (1999) have claimed that it is marked by a different pitch accent, namely  $H^*$ . Other researchers have made different claims (e.g. Twaha 2017 for Assamese), but the actual descriptions and pitch tracks seem to suggest that the sentence-level prosodic phrase bears a  $H$  tone. The prenuclear contour has been claimed to be also  $LH$  by most researchers, as mentioned above. We turn to this in more detail after discussing the individual tunes in Bengali.

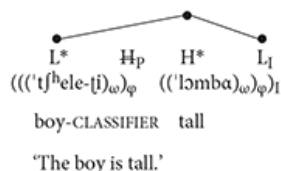
### 21.5.1 Declarative

Bengali is strictly verb-final and the verb will form a nuclear phrase. However, not all sentences need to have a verb, as seen in (5a). More generally, the nuclear pitch accent  $H^*$  would be aligned to the first prosodic word of the last prosodic phrase of an IP in a declarative intonation. Importantly, Bengali obeys the OCP within IP's, disallowing sequences of  $H$  tones.

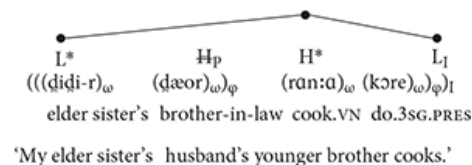
(5)

## Declarative neutral TUNE (surface)

a.

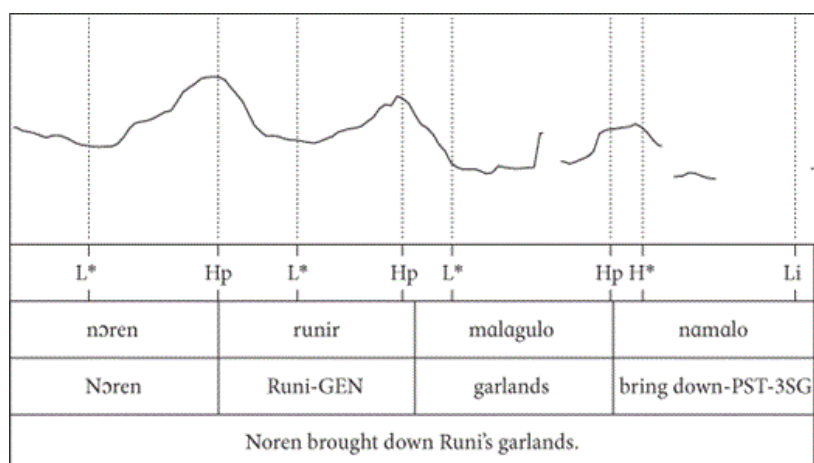


b.



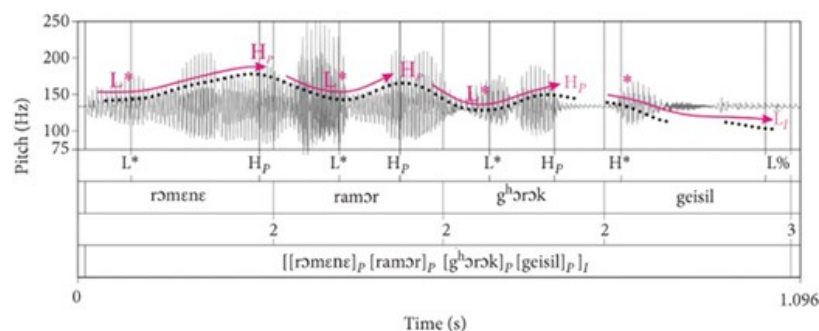
In (5a), *tall* is the last full prosodic element to carry stress and thereby align to H\*. In (5b), /didi-r dæor/ falls within a single phonological phrase and can undergo assimilation; thus, the phrase /didi-r dæor/ 'elder sister's husband's younger brother' surfaces with gemination: [didi:dæor]. Since the prenuclear accent is L\*Hp, the OCP will delete one of the H tones. In the examples, we have indicated the deletion of the phrasal Hp, but we could equally well have deleted the second H; pitch tracks show that there is a H hovering around the edge of the phrase, as in Figure 21.1. In §21.5.3, evidence is presented that in YES/NO questions, Hp is deleted when it is adjacent to a final H<sub>I</sub>.

Figure 21.1

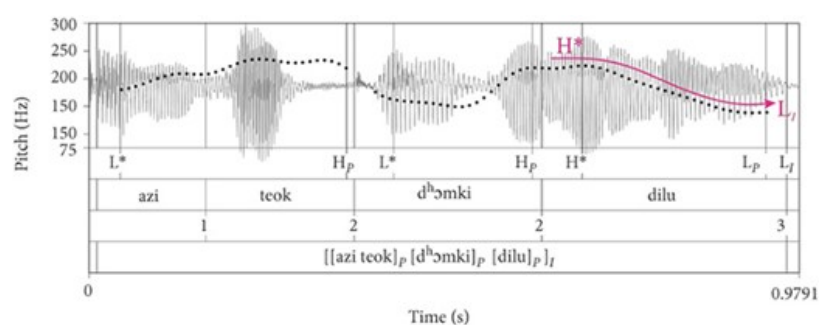


Declarative intonation in Bengali.

Twaha (2017) provides detailed analyses of Standard Colloquial Assamese (SCA) and Nalbariya Variety of Assamese (NVA). In both varieties, each phonological phrase has a L\*Hp tune, while the final verb bears a pitch accent H\* in a declarative sentence, as seen in Figure 21.2.<sup>7</sup> Twaha later (2017: 79) suggests that only NVA, not SCA, has a H\* on the verb or verbal complex, apparently assuming an OCP deletion of H\* occasioned by the preceding Hp in SCA. The NVA example is given in Figure 21.3.<sup>4</sup>

**Figure 21.2**

Standard Colloquial Assamese 'Ram went to Ramen's house' (Twaha 2017: 57).

**Figure 21.3**

Nalbariya Variety of Assamese 'Today I scolded him' (Twaha 2017: 79).

p. 323 In sum, it appears that the H\* on declaratives does show up in dialects of Assamese and even in the standard variety. With respect to the OCP disallowing sequences of H tones, Twaha (2017: 80) concludes: 'However, the H\* nuclear accent in NVA declarative utterances may not be always phonetically apparent due to the phonetic pressure created by the prosodic boundary tones preceding and following it (H<sub>P</sub> and L<sub>I</sub> respectively).' Consequently, although we see a sequence of H tones in the figures, they do not in fact always surface.

Khan (2008, 2014) suggests that in Bangladeshi Bengali (spoken largely in Dacca), no sequence of identical tones is accepted, although no explicit assumption of the OCP is made. Following Selkirk's (2007) analysis of Bengali, Khan argues that if an accentual phrase ends in a H tone, the following pitch accent is L and vice versa. This general pattern is again similar to what we have seen above.

Féry (2010) argues that Hindi neutral sentences consist of repetitions of LH ending with HL and claims that the same sequences are maintained regardless of whether one chooses the canonical word order to be SOV or SVO or whether the elements are focused. That is, focus is also LH, be it initial or medial, and does not change the overall picture (see more in §21.3.2). Her coding of an SOV sentence, with focus on the subject, is given in example (6).

(6)

Hindi: SOV focus (Féry 2010: 294)

|                |                |                |                |                |                |
|----------------|----------------|----------------|----------------|----------------|----------------|
| L <sub>P</sub> | H <sub>P</sub> | L <sub>P</sub> | H <sub>P</sub> | H <sub>P</sub> | L <sub>I</sub> |
| adhaypak       | ne             | moorti         | ko             | banaaya        |                |
| teacher        | ERG            | sculpture      | ACC            | make.PAST      |                |

Note that Féry labels the accusative marker with a H tone followed by another H on the verb, although no obvious plateau is apparent from the figure. The same sort of picture is observable in the Dravidian languages Tamil and Malayalam; the general pattern continues to be LH-marked phrases ending with HL, as (7) and (8) show.

(7)

Tamil (Féry 2010: 305)

|                            |                        |        |        |                      |              |
|----------------------------|------------------------|--------|--------|----------------------|--------------|
| $L_p$                      | $H_p$                  | $L_p$  | $H_p$  | $H_p$                | $L_I$        |
| [[meeri] <sub>p</sub>      | [niRaiya] <sub>p</sub> | [ceer  | vaank- | in-aaL] <sub>p</sub> | <sub>I</sub> |
| Mary                       | many                   | chairs | buy-   | PAST-PNG             |              |
| 'Mary bought many chairs.' |                        |        |        |                      |              |

(8)

Malayalam (Féry 2010: 307)

|                                    |       |                              |              |                         |                       |              |       |
|------------------------------------|-------|------------------------------|--------------|-------------------------|-----------------------|--------------|-------|
| $L_p$                              | $H_p$ | $L_p$                        | $H_p$        | $L_p$                   | $H_p$                 | $H_p$        | $L_I$ |
| [[Peter] <sub>p</sub>              | [oru  | [rasakaram-aya] <sub>p</sub> | <sub>p</sub> | [pustakam] <sub>p</sub> | [vaichu] <sub>p</sub> | <sub>I</sub> |       |
| Peter                              | one   | interesting                  |              | book                    |                       | read         |       |
| 'Peter read one interesting book.' |       |                              |              |                         |                       |              |       |

There would thus appear to be a general constraint that prohibits a sequence of identical tones in most Indian languages. For Bengali, Hayes and Lahiri (1991) and Lahiri and Fitzpatrick-Cole (1999) argue that the  $H^*$  of a declarative final prosodic phrase clashes with the preceding prenuclear LH. The arguments that have been raised against the assumption of a pitch accent on the final verb (cf. Dutta and Hock 2006) are probably based on the intolerance of a sequence of H tones, which causes variation in the surface alignment of the remaining H, as in Bengali, Hindi, and Assamese.

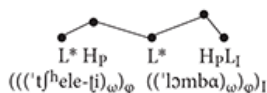
## p. 324 21.5.2 Focus

Returning now to our example in (5), we saw that in a neutral declarative sentence, Bengali has an initial  $L^*H_p$  prenuclear accent, followed by a final  $H^*L_I$ , as shown in (5) and (6). The OCP deletes one of the high tones, so this contour surfaces as an initial low followed by a rise to the last prosodic phrase (which need not be the verb). If, however, one element, such as [lɔmba] 'tall', is focused, we see very different patterns. The focus tune is  $L^*H_p$  followed by a final  $L_I$  for the declarative. In (9a), the focus on [lɔmba] is marked by  $L^*H_p$ . Focus on pre-final constituents, such as [tʃeleʃi] in (9b), is shown by the deletion of post-focal pitch accents, a feature that Bengali shares with many Indo-European languages. Example (9c) shows a sequence of two phonological phrases each consisting of two words, with focus on the second phonological phrase, the complex verb [raŋ.a kɔre] 'cook-3SG'. In this analysis, the boundary tones are linked to edges of prosodic constituents, but their targets do not necessarily appear strictly at the edges. In contrast, the pitch accents  $L^*$  or  $H^*$ , which are always linked to the initial syllable of the first prosodic word, are more stably aligned to the stressed syllable.

(9)

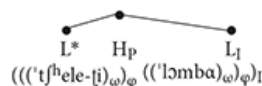
## Bengali: focus intonation

a.



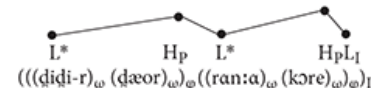
‘The boy is (really) tall!’

b.



‘The boy is tall’

c.

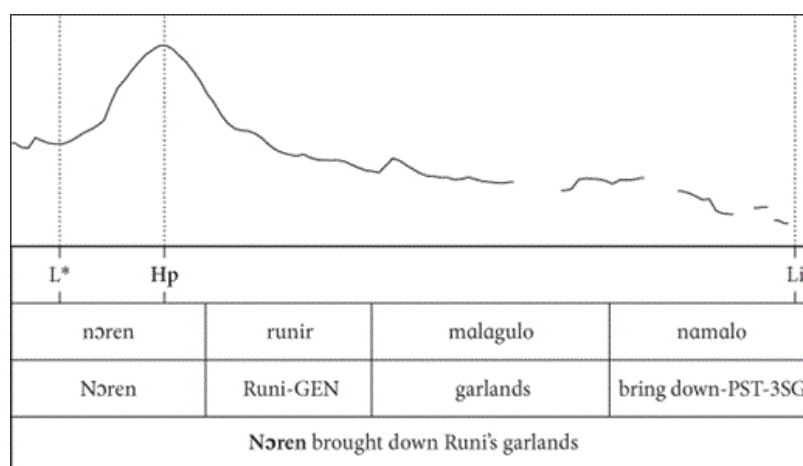


[ḍiḍiḍ:æor]

‘Sister’s brother-in-law cooks!’

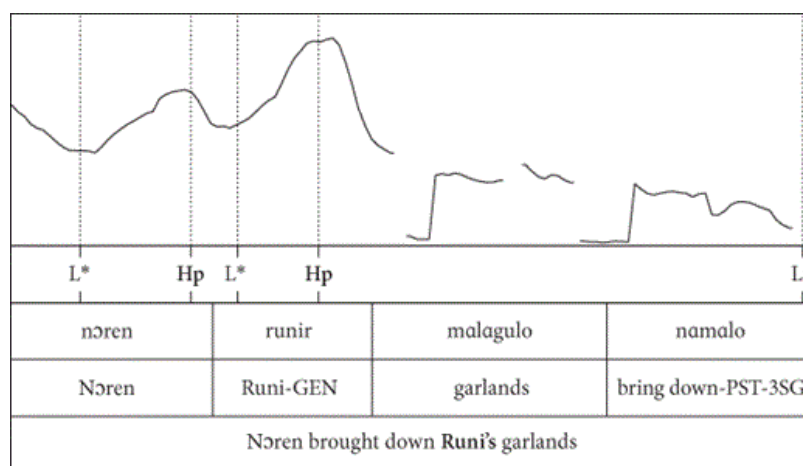
We have taken a sentence with sonorants to illustrate the  $L^*H_p$  contour for both the prenuclear and the focus TUNES. In Figure 21.4, the first word *Noren* is focused and we see a clear  $L^*H_p$  contour with a gradual fall ending with a  $L_1$  at the end of the sentence; this should be compared with the example in Figure 21.1. Figure 21.5 illustrates the prenuclear as well as the focus contour on *Runir*; here the focus suggests that it is Runi’s garlands that were brought down and not someone else’s. The prenuclear  $L^*H_p$  is lower than the focus contour, and again the intonation goes down to a final  $L_1$ .

Figure 21.4



Bengali intonation, focus on *Noren*.

Figure 21.5



Bengali intonation, focus on *Runir*.

The Bengali examples suggest that  $L^*H_p$  is the focus TUNE and that the final non-focused TUNE is  $H^*L_p$ , typically associated with the sentence-final verb or verbal cluster (a complex  $\hookrightarrow$  predicate or a noun-incorporating verb). Assamese has a similar pattern. Twaha (2017) states that the focused element begins with a  $L^*$  pitch accent and ends with a focus  $H$  boundary tone, which he labels as  $L^*fH_p$ . An example is given in (10).

(10)

Assamese (Twaha 2017: 111)

$L^*$        $H_p$        $L^*$        $H_p$   $L^*$        $fH_p$        $L_1$   
 [[rɔmɛn-ɛ]<sub>p</sub>    [dɔrɜa-r]<sub>p</sub>    [sabi-pat]<sub>p</sub>    [milɔn-ɔk]<sub>p</sub>    [di-lɛ]<sub>p</sub>]<sub>1</sub>  
 Ramen-NOM door-GEN key-CL Milan-ACC give-3SG.PAST  
 'Ramen gave the door-key to Milan.'

Three further comments need to be added. First, if the focused constituent is longer than one prosodic word, the contour breaks up into  $L^*H$   $fH_p$ . Second, if the focused constituent is towards the beginning of the sentence, the rest of the sentence ends with a general fall; thus, there is again post-focal deaccenting. Both of these are illustrated in example (11).

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(11)

Assamese (Twaha 2017: 106)

$L^*$        $H_p$        $L^*+H$        $fH_p$        $L_1$   
 [[madhɔb]<sub>p</sub>    [kɔmɔla    kha-bo-loi]<sub>p</sub>    [khɔgɛn-ɔr    ghɔr-ɔloi]<sub>p</sub>    [go-ise]<sub>p</sub>]<sub>1</sub>  
 Madhab orange eat-FUT-DAT Khagen-GEN house-DAT go-PAST.3SG  
 'Madhab went to Khagen's house to eat oranges.'

Third, if the final verb is focused, there will be a sharp drop to the end of the sentence, as shown in (12).

(12)

Assamese (Twaha 2017: 105)

$[[r\acute{o}m\acute{e}n-\acute{\epsilon}]_p \quad [d\acute{o}rza-r \quad sabi-pat]_p \quad [mil\acute{o}n-\acute{o}k]_p \quad [di-l\acute{\epsilon}]_p ]_I$   
 $L^* fH_p L_I$   
 Ramen-NOM door-GEN key-CL Milan-ACC give-PAST.3SG  
 'Ramen gave the door-key to Milan.'

Except for focusing longer constituents, SCA and Bengali are very similar. In Bengali, a longish focused constituent such as *runi-r malagulo* would provide a smooth rise, while in SCA it would be broken up.

For Hindi, Féry (2010: 294) argues that the focused contour is also the same LH, as 'there was no change in the overall contour'. She reports Moore's (1965) claim that a H boundary is placed after the focused constituent; this would be similar to that in Assamese and Bengali. According to Féry's own work, however, the only real difference between focused and non-focused utterances is that if the focus falls on an early constituent, there is a greater phonetic pitch rise, while the post-focal constituent is lowered.

Tamil is also claimed to have a LH pattern ending with HL on the verb in a neutral sentence. However, when the object is topicalized, the sentence ends with LH, as in (13).

(13)

Tamil (Féry 2010: 306)

$L_p \quad H_p \quad L_p \quad H_p \quad L_p \quad H_p \quad L_p \quad H_I$   
 $[[[niRaiya]_p \quad [ceer]_p]_I \quad [[meeri]_p \quad [vaank- \quad in-aaL]_p ]_I$   
 many chairs Mary buy- PAST-PNG  
 'Mary bought *many chairs*.'

Similarly, Malayalam shows an identical pattern of LH ending with HL. Of course, many sentential and morphosyntactic options are available to mark focus. Nevertheless, from an intonation perspective, the Indo-Aryan and Dravidian languages appear to have very similar patterns.

Structural devices to mark focus differ across languages. West Germanic languages, for example, use pitch accents to indicate focused parts of sentences, while European Portuguese differentiates presentational focus from corrective focus by pitch accents, using H+L\* for the former and H\*+L for the latter. In Italian, narrow focus is not expressed through deaccenting within noun phrases. Japanese, in contrast, marks focus by preventing the lowering of the pitch range, which is otherwise automatic. Northern Bizkaian Basque can allow complex noun phrases with a single accent on the final word to have exclusive focus on a preceding word, as in [lagunen aMA] friend-GEN.SG mother 'The FRIEND's mother' (Elordieta and Hualde 2014).

English marks focus for domains that may include unaccented words—for example, 'Don't move the dinner table, just move the **kitchen** table' (focus ambiguous ↪ between *kitchen* and *kitchen table*). In contrast, Bengali can discriminate words even within compounds, as a consequence of the combination of phrasing and pitch accent marking. In a declarative sentence such as *nirmal lalbari-r malik* 'Nirmal is the owner of the red house', one could focus *lalbari* 'the red house' or just *lal* 'red', suggesting that Nirmal owns the **red** house (not the black one). The contour, given in (14), shows that when the compound *lalbari* is the focus, the pitch accent associated with [lal] is followed by a continuous rise to the beginning of *malik*, while when the focus is on *lal*, the L\*H contour is only on that part of the compound.

(14)

## Bengali focus within compounds

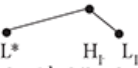
- a.  $L^* \quad H_p$   
 nirmɔl lal bari-r malik  
 Nirmal **red**house-GEN owner  
 'Nirmal is the owner of the red house.'
- b.  $L^*H_p$   
 nirmɔl lal bari-r malik  
 Nirmal **red**house-GEN owner  
 'Nirmal is the owner of the **red** house [not the black one].'

## 21.5.3 Yes/no questions, with and without focus

In Bengali, as probably in most Indo-Aryan languages, the YES/NO question TUNE carries a  $L^*$  pitch accent and ends with a contour boundary tone  $H_L L_L$ . The examples in (15) illustrate the contour.

(15)

## Yes/no contours

- a.   
 $L^*H_L L_L$   
 kɔfi?  
 'Coffee?'
- b.   
 $L^* \quad H_L \quad L_L$   
 'tʃʰeleʃi kʰubʰlɔmba?  
 'Is the boy very tall?'
- c.   
 $L^* \quad H_L L_L$   
 ɕiɕi-r ɕæor ran:a kɔre?  
 [ɕiɕiɕi:æor]  
 'Does elder sister's brother-in-law cook?'

p. 328 As we can see, the generic contour in Bengali is LH, the important distinction being between  $H^*$ , which signals a neutral declarative, and  $L^*$ , which is used for focused declaratives as well as for YES/NO questions. There now arises the question of how focused YES/NO questions are prosodically distinct from broad-focus ones. If  $L^*$  is also used to mark focus in interrogatives, and it is, how can a neutral YES/NO question be distinguished from a focused one? Consider the orthographic string in the Bengali equivalent of the sentence 'Has mother invited father's friend?' in (16) and the three tonal structures in (a), (b), and (c). Observe that in (16a) and (16b), the OCP has deleted the medial phrasal  $H_p$ .

(16)

| Underlying versus surface patterns in YES/NO questions |            |                                      |                           |                                                       |
|--------------------------------------------------------|------------|--------------------------------------|---------------------------|-------------------------------------------------------|
| ma:-ki                                                 | baba-r     | bond <sup>h</sup> u-ke               | nemonton:o                | kor-e-tj <sup>h</sup> -e                              |
| mother-QPART                                           | father-GEN | friend-OBLIQ                         | invitation                | do-PERF-PROG-3                                        |
| 'Has mother invited father's friend?'                  |            |                                      |                           |                                                       |
|                                                        |            |                                      | L*                        | H <sub>p</sub>                                        |
| a. ma:-ki                                              | baba-r     | bond <sup>h</sup> u-ke               | [nemonton:o] <sub>f</sub> | kor-e-tj <sup>h</sup> -e                              |
|                                                        | L*         | H <sub>p</sub>                       |                           | H <sub>i</sub> L <sub>i</sub>                         |
| b. ma:-ki                                              | [baba-r    | bond <sup>h</sup> u-ke] <sub>f</sub> | nemonton:o                | kor-e-tj <sup>h</sup> -e ] <sub>i</sub>               |
|                                                        | L*         |                                      |                           | H <sub>i</sub> L <sub>i</sub>                         |
| c. ma:-ki                                              | [baba-r    | bond <sup>h</sup> u-ke               | nemonton:o                | kor-e-tj <sup>h</sup> -e] <sub>p</sub> ] <sub>i</sub> |

Structure (16a) indicates a narrow focus on [nemonton:o] 'invitation'—that is, the question is whether mother actually **invited** father's friend (as opposed to the friend coming uninvited). In contrast, the focus on [baba-r bond<sup>h</sup>u-ke] 'father's friend' in (16b) suggests that mother specifically invited **this** friend, and not someone else. The most generic reading is intended to be (16c), an answer to 'What happened?' Unfortunately, (16b) and (16c) are identical with respect to intonation. Given the OCP constraint, the H<sub>p</sub> of the focus phrase is deleted, an inevitable consequence in the context of the question TUNE.

The claim for Bengali has been that the focus tune is L\*H<sub>p</sub>, which suggests that focus marking has three elements: (i) the L\* pitch accent, (ii) a H<sub>p</sub> boundary tone, and (iii) a phrase boundary delimiting the focused part. The third element is relevant for the evaluation of an alternative account in which H<sub>p</sub> is interpreted as a prominence-marking tone. Selkirk (2007: 2) seeks to 'eliminate focus-phrasing alignment constraints from the universal interface constraint repertoire and to reduce all nonmorphemic, phonological, reflexes of focus to reflexes of stress prominence' (a typological treatment of prosodic focus is offered in chapter 31). Consequently, under this view there are no constraints like ALIGN L/R(FocusP) where P is a prosodic constituent like  $\varphi$ . Since in our account the OCP and the phrase boundary requirement for the focus are independent phonological constraints, the prediction is that the OCP-triggered deletion of H<sub>p</sub> leaves the phrase boundary unaffected. In order to test this, we will look at phrasal assimilation rules: since these are bounded by phonological phrases, removal of the phrase boundary predicts an application of the assimilation rules within the merged phonological phrase. To illustrate the two scenarios, let us consider the four intonational structures provided for [mama-r jali-r bie] 'wedding of mother's brother's wife's sister' (17), illustrated in Figure 20.6, focusing on the interaction between the intonation contour and the phonological phrase structure.

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(17)

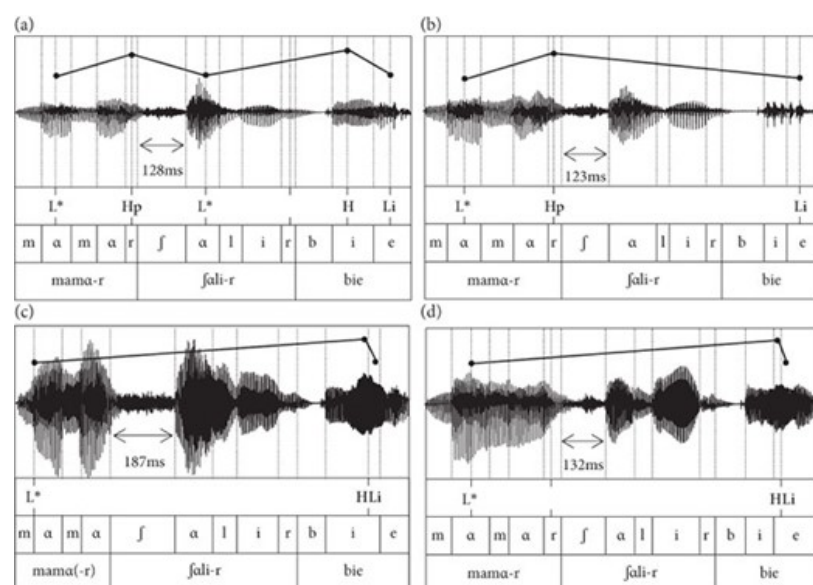
mama-r                      jali-r                      bie  
 mother-brother-GEN   sister-wife-GEN   wedding  
 'Mother's brother's wife's sister's wedding'

Figure 21.6a is the neutral declarative, as presented earlier in (5) and (6), with [bie] carrying the last H\*L<sub>i</sub> pitch accent and [mamar], [jalir], and [bie] occurring in separate  $\varphi$ 's, whereby the H<sub>p</sub> of [jalir] was deleted by the OCP. The failure of [rj] to be assimilated to [ɹj] at the boundary between [mamar] and [jalir] shows that this assimilation rule cannot apply across a phonological phrase boundary. As expected, deaccenting [jalir] and [bie] to mark an early focus on [mamar], shown in panel b, cannot alter the status of that boundary, since the focus is ended by a phonological phrase boundary. While this boundary is here overtly marked by H<sub>p</sub>, an early focus in an interrogative sentence will not be able to retain its H<sub>p</sub>, because it will be deleted by the OCP, as triggered by the final H<sub>i</sub>L<sub>i</sub>. Panel d shows the interrogative counterpart to panel b, and it does not show the assimilation, indicating the presence of a phonological phrase boundary. For the assimilation to apply, the sentence must have neutral focus and be spoken without the now optional boundaries, as in panel d. Thus, while the surface TUNES in panels c and d are identical (L\*H<sub>i</sub>L<sub>i</sub>), the

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phrasing is not, and while r-CORONAL ASSIMILATION potentially applies in cases such as panel c,  $\varphi$ -structure in neutral sentences being optional, the phrase break before [jalir] is obligatory, since it comes between focused [mama-r] and post-focal [jalir die], blocking assimilation.<sup>8</sup> This means that phonological phrases, while being restricted to maximally one pitch accent each, can be unaccented. The question of the discriminability of YES/NO questions with broad and narrow focus and the possible roles of r-CORONAL ASSIMILATION and pitch range remains a topic for future research.

**Figure 21.6**



Four prosodic structures for Bengali [mama-r jalir bie] ‘Mother’s brother’s wife’s sister’s wedding’. The neutral, broad-focus declarative (a); the declarative with focus on [mama-r] ‘It is **Mother’s brother’s** wife’s sister’s wedding’ (b); the neutral, broad-focus YES/NO question (c); the YES/NO question with focus on [mama-r] ‘Is it **Mother’s brother’s** wife’s sister’s wedding?’ (d). Only in (c) can r-CORONAL ASSIMILATION go through, since there are focus-marking phonological phrase boundaries after [mamər] in (b) and (d), and an optional, tone-marked phonological phrase boundary in (a).

## 21.6 Segmental rules and phrasing

Despite their potential evidence, segmental processes are rarely appealed to for confirmation of prosodic phrasing. Hayes and Lahiri (1991) and Lahiri and Fitzpatrick-Cole (1999) provide evidence from assimilation rules in support of phonological words and phrases. These include VOICING ASSIMILATION as well as the r-CORONAL ASSIMILATION discussed in §21.5.3. Other Indian languages have also reported phonological processes constrained to apply only within phonological phrases. Twaha (2017) provides evidence of ASPIRATE SPIRANTIZATION and FLAPPING, in addition to voicing assimilation and /r/ assimilation. In NVA, r-CORONAL ASSIMILATION within a phonological phrase is triggered by a focus constituent, as shown in (21).

(21)

Assamese (Twaha 2017: 136)  
 rəməne (dərzar sabipat milənək dilak)  
 Ramen-NOM door-GEN key-CL Milan-ACC give-PAST.3SG  
 ‘Ramen gave the door-key to Milan.’

Furthermore, intervocalic spirantization can apply across prosodic word boundaries, but it has to be phrase-internal. Thus, ASPIRATE SPIRANTIZATION occurs in (22a) but not in (22b). Therefore, focus-governed phrasing can also constrain phonological rules in Assamese.

(22)

Assamese (Twaha 2017: 137–138)

- a.  $[[r\acute{o}m\acute{e}n-\acute{e}]_p [makh\acute{o}n-\acute{o}r\ g\acute{h}\acute{o}r-\acute{o}t]_p [k\acute{o}mla]_p [k^h\acute{a}-ba\ ge-\acute{i}si]_p]_I$  *does not apply*  
 b.  $[[r\acute{o}m\acute{e}n-\acute{e}]_p [makh\acute{o}n-\acute{o}r\ g\acute{h}\acute{o}r-\acute{o}t]_p [k\acute{o}mla\ k^h\acute{a}-ba\ ge-\acute{i}si]_p]_I$  *does apply*  $[k^h] > [x]$

## 21.7 Conclusion

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The Indian subcontinent is vast. Not only are there many languages but there are also at least four language families. Unlike in Germanic, stress does not play a very important role in most of these languages in terms of marking lexical contrast, and minimal pairs such as *tórmént* (N) and *tormént* (V) will not occur. Nevertheless, stress does play a role in pitch accent association as well as in distributional constraints on segments; for example, nasal and oral vowels are contrasted in Bengali only in stressed position and thus only occur word-initially. Very rarely do we find tonal contrasts; Punjabi is the only language that has been claimed to have developed tone. The intonational systems are very comparable. In general, the basic contour appears to be LH, for prenuclear as well as focus tunes. Unsurprisingly, the pitch accents are aligned to the most prominent syllable, which may not be word-initial (e.g. Hindi; Khan 2016). Recent cross-linguistic studies confirm that, despite variation, the data are compatible with accentual phrases (also equated with phonological phrases) that begin with a L pitch accent and end with a H (Khan 2016, based on *North wind and the sun* in six languages; Deo and Tonhauser 2018, based on data from Chodri, Marathi, and Gujarati). Nevertheless, Khan argues that this is clearer in the Indo-Aryan languages than in Dravidian. The end of the focus seems generally to be demarcated by a H boundary tone. Moreover, sequences of identical tones would appear to be generally disallowed. Finally, we have seen that segmental processes are also bound by the accentual or phonological phrase in many languages.

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## Notes

- 1 The Indian Nagaland is covered in chapter 23.
- 2 Davis (2011) argues that although generally geminate consonants have an underlying mora, it could be the case that other factors constrain the surface realization. Mohanan and Mohanan (1984) also suggest that geminates in Malayalam may not be truly moraic.
- 3 Masica writes the lax vowels /ɪ ʊ/ as capital /I, U/. Also, following traditional usage for our languages, P and I are used instead of ϕ and ι to indicate the phonological phrase and the intonational phrase.
- 4 Note that vowels are raised one step when a high vowel follows.
- 5 Cases of Bengali loans in English demonstrate that borrowed words in English conform to English stress rules: largely penultimate if heavy, otherwise antepenultimate. For instance, *Darjeeling* (a favourite Himalayan resort in West Bengali) is pronounced in Bengali as [ˈd̪ard͡ʒilin] while English has predictably borrowed it with stress on the penultimate syllable *Darjéeling*.

- 6 The tone contrast must represent a fairly recent case of tonogenesis. The Gurmukhi script, which dates to the early sixteenth century, still indicates voiced aspirates in syllables with falling tone (Jonathan Evans, personal communication). Mikuteit and Reetz (2007) give a detailed description of the acoustics of voiced aspirates in Dacca Bengali, providing evidence that they are really voiced and aspirated.
- 7 Twaha (2017: 57–58) claims that ‘in the third P-phrase *ghɔɾk*, a plateau is observable after HP is manifested on the first mora of the final syllable *rk*. This plateau is caused because, unlike the preceding two P-phrases, the following P-phrase *geisil* bears a high pitch accent H\* on its first syllable. Since H\*, as per the proposal here, is aligned to the first mora of the initial syllable of *geisil*, the interpolation from Hp of *ghɔɾk* to H\* of *geisil* creates a plateau.’ However, the H\* on the verb is not marked consistently; in some figures there is only a rising contour on the pre-verbal phrase followed by a sentence-final L boundary tone.
- 8 To test this, in a pilot study we examined all occurrences of /r/ plus coronal obstruent sequences in focused questions of the type shown in panel c of Figure 21.6 in the oral rendition of the book *Epar Bangla Opar Bangla* (Bengal on this side and the other) (Fitzpatrick-Cole and Lahiri 1997). There was a total of 11,205 tokens with various coronal obstruents (stops, [tʃ], [ʃ]). Since r-CORONAL ASSIMILATION leads to complete gemination, it was easy to measure the duration of closure or the duration of frication for the stridents. Our results were as follows: 87% had a complete sonorant /r/, in 5% it was difficult to tell whether the /r/ was there or not, and 8% had complete assimilation. Thus, when the phrase boundary was there, despite the fact that there was no H boundary tone, the phrase boundary blocked the assimilation.