INTONATIONAL PHONOLOGY AND FOCUS IN TWO VARIETIES OF ASSAMESE

A

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TO *MY PARENTS* AND *MY WIFE*,
AND MY FRIEND *JAYANTA*

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ABSTRACT

This dissertation studies the intonational phonology and the prosody of focus realisation in two varieties of Assamese: Standard Colloquial Assamese (henceforth SCA) and Nalbariya Variety of Assamese (henceforth NVA). Pitch modulation is adopted cross-linguistically; some languages (tone and pitch-accent languages) use it at the lexical level, some (intonational languages) at the post-lexical level, while some others at both levels. Since Assamese is neither a tone nor a pitch accent language, its use of pitch modulation is restricted to the post-lexical level. Adopting the intonational framework based on works by Liberman (1975), Bruce (1977), Pierrehumbert (1980), Beckman and Pierrehumbert (1986a), and Pierrehumbert and Beckman (1988), the present work proposes an intonational model for Assamese with special reference to SCA and NVA. This dissertation uses a modified version of the ToBI transcription system (Asm_ToBI) to report the tonal inventory of the two varieties comprising prominence lending (pitch accents) and non-prominence lending tones (boundary tones). It is found in the present work that Assamese maintains a hierarchically arranged prosodic structure, where a finite set of prosodic constituents are organised in hierarchical order: Intonational phrase > Phonological phrase > Prosodic word.

The dissertation further makes investigation into two different types focus realisation in SCA and NVA: contrastive focus and morphologically marked focus. The findings show that both types of focus exercises a phasing effect. In SCA, the focused constituent forms a P-phrase, which is followed by complete pitch compression, whereas in NVA, the focused constituent forms a P-phrase together with the constituents following it. In comparison with contrastive focus realisation, in morphological focus realisation, the morphological focus markers are attributed with a high focus pitch accent. While segmental cues to post-focus dephrasing is robust in NVA, they are not always obvious in SCA. Focus is always characterised by greater pitch value and post-focus pitch compression. Thus this study provides an insight into the prosodic structure and focus realisation in two Assamese varieties.

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Chapter 1 Prolegomena

1.1 Aims of this dissertation

This dissertation studies the intonational phonology and the prosody of focus realisation in two varieties of Assamese: Standard Colloquial Assamese (henceforth SCA) and Nalbariya Variety of Assamese (henceforth NVA). Although there have been several remarkable studies undertaken on other South Asian Languages (henceforth SALs) like Kolkata (Hayes & Lahiri, 1991; Lahiri & Fitzpatrick-Cole, 1999) and Bangladeshi (Khan, 2008) Bengali, Hindi (Patil, et al., 2008; Féry & Kügler, 2008), and Tamil (Keane, 2014), and Asian languages like Korean (Jun, 1993; Jun & Lee, 1998) and Japanese (Beckman & Pierrehumbert, 1986a; Venditti, 2005), to enumerate a few, Assamese lacks a systematic and detailed study in this respect. In the present work, following the intonational framework adopted by Liberman (1975), Bruce (1977), Pierrehumbert (1980), Beckman and Pierrehumbert (1986a), Pierrehumbert and Beckman (1988), and Hayes and Lahiri (1991), we have considered the fundamental frequency or F_0 contour and various phrase internal segmental processes as reliable cues to the underlying prosodic structure in the two studied varieties.

The present study is motivated by and aims to answer the following research questions:

i. What is the inventory of tones in SCA and NVA?
ii. What are the prosodic domains in the two varieties and how are they arranged?
iii. How is focus manifested phonologically and phonetically in SCA and NVA?
iv. What effect does focus exercise on the focused as well as on the constituents preceding and following it?

Pitch modulation is a universal linguistic feature, though languages may differ in respect of the level at which it is applied. The fundamental frequency contour provides a physical representation of the pitch modulation with which segmental strings are uttered. While tone languages like Mandarin (Xu, 1999) and Mambila (Connell, 1999) and pitch accent languages like Japanese (Haraguchi, 1977) and Swedish (Bruce, 1977) employ pitch movements phonemically at the lexical level, there are SALs like Bengali (Hayes & Lahiri, 1991; Khan, 2008), Hindi (Patil, et al., 2008), and Tamil (Keane, 2014) and European languages like English (Pierrehumbert, 1980) and Italian (Grice M. , 1995) that

post-lexically assign tones to prosodic constituents. Intonation refers to this post-lexical utilisation of tones in languages.

1.2 Intonation through history

In spite of intonation being an integral part of languages, the curiosity in the study of intonation started to grow only in the 20th century, and it was not until the 1970s that some momentous developments took place. Before 1970s there were no methods or frameworks to back a comprehensive intonational study. Until then all the studies made on intonation were undertaken under the inspiration of theorists, and a scientific rigour was absent in them.

Ladd (2008) roughly categorised the approaches adopted in intonational studies before 1970s into two separate groups – *instrumental* or *phonetic* approach and *impressionistic* or *proto-phonological* approach. The former was adopted and developed by some experimental psychologists and phoneticians whose main objective was speech perception and to identify the acoustic cues to intonational phenomena such as syntactic-pragmatic notions like 'finality', 'continuation' and 'interrogation' or emotional states such as anger, surprise and boredom. The outcomes of these studies are some general findings such as the fact that active emotions like anger or surprise coincides with higher overall pitch or the duration of pauses at intonational breaks correlates with the syntactic strength of the boundary. On the other hand, the phonological approach assumes an abstract level of representation for intonational features. This approach was mainly adopted by linguists and language teachers, and they had some practical and theoretical purpose behind this. The teachers were interested in improving the pronunciation of foreign speakers of a language and the linguists' concern was a general development of phonemic theory. It is here that we see a significant change in the treatment of intonation in terms of smaller categorically distinct elements such as pitch phonemes, nuclear tones, etc.

From a methodological point of view, the instrumental approach was aimed at making measurements whereas the goal of impressionistic tradition was to construct a model for intonation. The rivalry between the two approaches continued until 1970s when linguists and scholars started to relate the phonological categories as described by impressionistic tradition to instrumentally validated acoustic or articulatory parameters.

1.2.1 Configurational vs level based models

Initially, intonation was thought and defined in terms of *tunes* or gestalts (Arvaniti, 2011a; 2011b): one pitch contour was interpreted as one tune without any internal structure; it is because linguists like Jones (1967) considered that there can be only two types of emphasis possible – contrastive and intensifying. Armstrong and Ward (1926) also proposed a similar two tune system – *Tune-I* and *Tune-II*. This view of intonation contours as gestalts has also been supported by researchers like Bolinger (1951), Cooper and Sorensen (1981), Xu (2005) among others.

Another group of researchers supporting configurational model acknowledged that intonation contours are combinations of primitives such as rises and falls or dynamic tones. The supporters of this group like Cohen and 't Hart (1968), 't Hart and Cohen (1973), 't Hart and Collier (1975), observed that intonation contours cannot be represented as gestalts since they do not simply stretch-out or shrink with the length of segmental strings they are associated with. Listeners perceive the difference among intonational contours not by considering the contours holistically, but by perceiving the pitch movements in the contour. The model developed at the Institute of Perception Research (henceforth IPO) is one of such models which describes intonational contours in terms of pitch movements (for details see 't Hart, Collier, & Cohen (1990)). These pitch movements are categorised as *prominence lending* and *non-prominence lending* pitch movements; while the former co-occur with stressed syllables, the latter do not designate any lexical prominence.

The British school, on the other hand defined intonational contours as *tone groups*, which are analysed further into smaller units viz. the *pre-head, head*, *nucleus* and *tail* (Crystal, 1972; O'Connor & Arnold, 1973). For them, a tone group must minimally contain the nucleus, which is realised on the most prominent syllable of the group. The head designates the contour stretch from the first stressed syllable to the nucleus, and the tail is the contour following nucleus. The pre-head refers to any F_0 stretch preceding the head. The British school model, like the gestalt model, were interested in the global contour shapes of each constituent units without acknowledging the existence of any possible local tone events.

This trend of postulating intonational melodies as gestalts or interpreting contours only in terms of dynamic tones was contradicted by the level based model proposed by the American structuralists like Pike (1945), Trager and Smith (1957) and Hockett (1955).

They spoke about the internal structure of intonation and the role played by intonation in conveying meaning. The linguists like Pike (1945), Wells (1945), Trager and Smith (1957) spoke about four level tones or '*pitch phonemes*' – Low, Mid, High and Overhigh, which occur at certain structurally salient points in the utterance. These phonemes are not representative of any inherent pitch range, they are defined in relation to one another. However, the level model of intonation was overshadowed temporarily by the contemporarily popular configurational model. Bolinger (1951) attacked the system of four level tones for representing intonation by saying that the distinctive functional units of intonation were really 'configurations' like 'rise' and 'fall'. According to him, apart from the degree of emphasis there is no difference between an utterance with Overhigh-High-Mid tone pattern and an utterance with High-Mid-Low tone pattern; as per the four level tone system, the two contours are distinct.

1.2.2 Autosegmental-metrical model of intonational phonology

Bruce's study on Swedish word accent added a new dimension to the perception of tune text association. In his study (Bruce, 1977) on Swedish word accents, he showed that accent-I and accent-II are marked by a H(igh) tone i.e. the F_0 maximum, and they differ from each other with reference to the timing of the pitch peak (H). In accent-I, the pitch reaches the peak (F_0 maximum) before the start of the accented syllable and in accent-II the F_0 touches its highest value right after the onset of the accented vowel. Although there is normally a fall after the peak, he noticed that this fall at times gets shortened or even truncated. It is the high peak which is invariably precise in its alignment in time with the segmental element, and not the fall of F_0 to the baseline height. Supporting the notion of alignment, Bruce proposed that in the Swedish accentual pattern, "reaching a certain pitch level at a particular point in time is the important thing, not the movement (rise or fall) itself" (Bruce, 1977, p. 132). Thus he did not consider pitch movement to be the basic unit of analysis, rather it is the alignment of a pitch levels (either L or H) to structurally defined points on the segmental string, between which the pitch interpolates. For Bruce, rises and falls of F_0 are only transitions between two phonetic alignments of tones: rising is a transition from L tone aligned tonal target to H tone aligned tonal target and falling is a transition from H aligned to L aligned tonal targets. The segment with which L is aligned gets lowest local F_0 value and the H aligned segment, as can be predicted, gets the highest F_0 value; these points of alignment were defined by Bruce as "turning points" – in terms of the local F_0 maxima and minima. Further, he differentiated turning points co-occurring

with lexically prominent syllables from those co-occurring with phrase boundaries which is identical to the distinction made by the IPO model ('t Hart, Collier, & Cohen, 1990) between *prominence lending* and *non-prominence lending* pitch events. According to Bruce (1977), lexical tones and phrasal tones do not require separate representations, rather they can be concatenated together in the same representation.

Bruce, however, did not attempt to phonologically represent the phenomena of alignment; for him it is only the outcome of the phonetic realisation. Pierrehumbert, in her dissertation (1980), proposed that in English, alignment of a tone with a segment on the segmental string may serve as a cue to the difference between two categorically distinct phonological associations: pitch accents and boundary tones. She proposed that only two tones, high (H) and low (L) are sufficient for the phonological representation of English intonation. Ladd (2008) used the term *autosegmental-metrical model* (henceforth AM model) *of intonational phonology* to refer to Pierrehumbert's model, developed further in Beckman and Pierrehumbert (1986a) and Pierrehumbert and Beckman (1988) among others.

She related alignment with the concept of phonological prominence with the adoption of star notation (T*), which she borrowed from Goldsmith (1976/ 1979). She proposed that a prominent syllable in the segmental string gets a pitch accent[1], which is usually marked by local pitch change (often marked by either a local F_0 maximum or a local F_0 minimum) in the global F_0 contour. According to Pierrehumbert (1980), the tone which is phonologically associated with the most prominent point on the segmental string is marked by a star, and that star, apart from being a cue to prominence, would also mark the precise location of tune-text alignment.

Taking further the argument of Bruce (1977) regarding alignment of pitch peak in Swedish accent, Pierrehumbert (1980) proposed bitonal pitch accents; in this view, rise and fall on an accented syllable are interpreted phonologically as L+H or H+L respectively. Moreover, she explains, the early and late alignment of peak or valley depends upon which tone of the bitonal combination is starred. If there is an early rise, the abstract phonological pitch accent would be L+H, however only the H is associated with

[1] The term *pitch accent* was first used by Bolinger (1951). According to him, like it is in the IPO model ('t Hart, Collier, & Cohen, 1990), a prominent word in a sentence is assigned a pitch accent on its stressed syllable.

the accented syllable; the pitch accent, according to Pierrehumbert, is to be represented as L+H*.

The next tonal association Pierrehumbert talks about occurs on the boundary. The concept of boundary tone which she presented in her work in 1980 was later on revised in her works with Beckman (Beckman & Pierrehumbert, 1986a; Pierrehumbert & Beckman, 1988). According to them, in case of boundary tones, the association of tone is with the boundary and not with the prominence of any specific syllable; such tones are realised on the final syllable of a prosodic phrase. Pierrehumbert (1980), proposed that H and L tones arranged linearly on an autosegmental tier and are associated to prominent nodes and boundaries of prosodic phrases, which are metrically arranged. Although these tones designate the targets for tone realisation, they do not represent the phonological specification of the contour between them. The course of intonational contour between two tonally specified targets is interpolation, and it is tonally underspecified (Pierrehumbert & Beckman, 1988).

1.3 Prosodic phrasing

AM model, apart from discussing the intonational specification, proposes for a hierarchically organised prosodic structure. Beckman and Pierrehumbert (1986a) puts forth the prosodic hierarchy of English where the highest node is the *intonational phrase* (henceforth IP), which corresponds normally to the clause. An IP minimally must comprise an *intermediate phrase* (henceforth ip), which is a unit larger than a prosodic word and smaller than an IP. In English such ips contain at least one pitch accent and a phrasal tone. Pierrehumbert and Beckman (1988) added another phrasal domain below the ip i.e. accentual phrase (henceforth AP) while describing the prosodic hierarchy of Japanese. Variations in the prosodic tree has been reported cross-linguistically; for instance in the prosodic hierarchy of Japanese (Venditti, 2005) and Korean (Jun, 1993), IPs directly dominate APs. On the other hand, in Bengali (Khan, 2008) and French (Jun & Fougeron, 2000) the existence of both ip and AP has been reported.

Another prosodic hierarchy was proposed by the Prosodic Phonologists like Selkirk (1984), and Nespor and Vogel (1986), Hayes (1989b), Hayes and Lahiri (1991), among others based on the syntactic information. In this hierarchy also, the highest node is the IP, which minimally dominates a Phonological phrase (henceforth P-phrase). The P-phrase is the immediately higher domain above the phonological word (henceforth P-

word) node. P-phrases are comparable to ips in English (Beckman & Pierrehumbert, 1986a) and APs in Korean (Jun, 1993) and Bangladeshi Bengali (Khan, 2008). Irrespective of their origin, syntax or intonation, both hierarchies obey the Strict Layer Hypothesis (Selkirk, 1984). According to this hypothesis, a non-terminal node in the hierarchy is exhaustively parsed into constituents from the level immediately below it. For instance, an IP must always contain P-phrases, and they in turn must contain only P-words.

In the present dissertation, views from both approaches, prosodic phonology and intonational phonology will be taken into consideration in order to determine the prosodic domains. Although the prosodic hierarchy used in the current study is as proposed by prosodic phonologists, it is not syntactically motivated. The domain of P-phrase is characterised by both intonational cues and segmental processes occurring domain internally.

1.4 ToBI transcription system

Based on the tonal representations proposed in the works by Liberman (1975), Bruce (1977), Pierrehumbert (1980), Beckman and Pierrehumbert (1986a), Pierrehumbert and Beckman (1988), Tone and Boundary Indices (ToBI) (Silverman, et al., 1992; Pitrelli, Beckman, & Hirschberg, 1994; Beckman & Elam, 1997; Veilleux, Shattuck-Hufnagel, & Brugos, 2006) transcription system was developed. The ToBI transcription system has been used in order to explicitly represent the intonational model proposed in the study. The labels used in the transcription are representative of phonological distinctions rather than being motivated by phonetic realisation (Pitrelli, Beckman, & Hirschberg, 1994; Beckman, Hirschberg, & Shattuck-Hufnagel, 2005). The ToBI system, apart from representing the phonologically contrastive tonal events, reports the hierarchically arranged prosodic structure.

Originally, the ToBI system was developed in order to label intonational and prosodic databases of Mainstream American English (MAE) (Pitrelli, Beckman, & Hirschberg, 1994). This system is known as MAE_ToBI. Subsequently there were studies on the intonation and prosody of other languages based on the ToBI system. For instance, German (Grice, Benzmüller, Mayer, & Batliner, 1996), Japanese (Venditti, 2005), French (Delais-Roussarie, et al., 2015), etc.

In ToBI transcription, the F_0 contour of a recorded utterance is presented electronically or on paper accompanied by four parallel tiers containing relevant information about transcription, tonal events, prosodic phrasing, segmental processes, etc. These four tiers are *tones*, *words*, *break* and *miscellaneous* tiers from top to bottom. The tone tier contains the information regarding tonal specification of pitch accents and boundary tones. The word tier contains transcription of orthographic words. In the third tier, which is the break indices tier, the prosodic boundaries are demarcated with the help of integer numbers from 0 to 4. In the final tier (miscellaneous) comments are given regarding any disjuncture marked in the above three tiers.

In the present work, the ToBI transcription framework has been used to propose the intonational model of SCA and NVA in accordance with the AM model. We will call it Assamese tone and boundary indices (henceforth Asm_ToBI) transcription system.

1.5 Focus

Focus refers to that part of an utterance which is informationally important or new. It is generally acknowledged that intonation plays an important role in marking the focus of a sentence in terms of sentence stress (Ladd, 2008). Focus has been categorised differently in different times by different groups of phonologists. Ladd (1980; 1983; 2008) categorised focus as *broad* and *narrow* focus with regards to the relation between the focused constituent and sentence stress. Ladd uses the term *narrow* focus to refer to the cases in which the focused status of a word or constituent is cued directly with an accent; it is "highlighted both phonetically and pragmatically" (Ladd, 2008, p. 214). However, the relation between focus and accent placement is not always direct; sometimes the focus is on a larger or 'broad' constituent comprising two or more words, or even a sentence, and the focus marking accent falls on a word within that broadly focused constituent. Ladd called this type of focus as broad focus. In broad focus, the accent falls on which word, is a matter determined by language specific structural principles (Ladd, 1983) of accent assignment. Ladd (1980, pp. 74-75) exemplified the two distinguished focus patterns with the help of the following two examples which he adapted from Halliday (1967):

1) John painted the shéd yesterday.

2) Jóhn painted the shed yesterday.

He explained that in (1) the focus can be 'the shed' or 'painted the shed' or even the whole sentence. Hence the sentence can serve as an answer to any of the questions: 'What's new, What did John do, What did John paint yesterday?' etc. If (1) is a reply to the initial two questions, it would get a broad focus, whereas if it is an answer to the third question then the sentence will be narrowly focused on 'the shed'. Again 'John' is narrowly focused in (2), which can only be an answer to "Who painted the shed yesterday?" Depending upon the domain, focus is divided into broad and narrow focus: when the focus is on a word or constituent, it is called narrow focus and when the focus is on a constituent larger than a word (phrase or IP), it is called broad focus.

What Ladd described as narrow focus has also been sometimes equated with 'contrastive focus' (henceforth CF). However, the equation is not always true: narrow focus is mainly concerned with the size of a focused constituent, whereas CF has a role in discourse. Wells (2006, p. 119) described 'CF' as 'a particular kind of narrow focus' where the focus is on a 'contrast the speaker is making'. Alternatively, narrow focus does not necessarily mean contrastive focus, "narrow focus can be used for reasons other than explicit contrast" (Ladd, 1980, p. 79).

In this dissertation two different types of narrow focus have been studied: contrastive focus and morphologically marked focus. Following Rooth (1992; 1997) and Krifka (2007), these focus types have been defined in terms of a set of alternatives. When a constituent receives focus, it generates a set of alternatives which constitute its focused meaning. Krifka's (2007, p. 18) definition of focus has been given in (3).

3. Focus indicates the presence of alternatives that are relevant for the interpretation of linguistic expressions.

Prosodic marking of focus varies depending upon the language typology. Jun (2005; 2011) proposes a language typology depending upon the prominence pattern at the phrase level. She differentiates head-prominence languages from edge-prominence languages, in that the former employ pitch accents to mark prominence, the latter mark prominence by 'manipulating' prosodic boundaries. While head-prominence languages like English (Ladd, 2008) and Dutch (Gussenhoven, 1983) assign the IP final pitch accent to the focused constituents, edge-prominence languages like Japanese (Pierrehumbert & Beckman, 1988) and Korean (Jun & Lee, 1998) initiate prosodic phrases containing the focused constituent.

1.6 Introduction to SCA and NVA

Assamese, spoken by 13,168,484 speakers in India as per Census of India 2001 (Census Report, 2001), belongs to the Eastern Indo-Aryan language area of the Indo-European language family (Goswami , 1982; Goswami & Tamuli, 2003; Dutta Baruah, 2007). The dialectal variation of Assamese can be categorised into four groups: 1) the eastern Assamese group, 2) the central Assamese group, 3) the Kamrupi group and 4) the Goalparia group (Moral, 1996a).

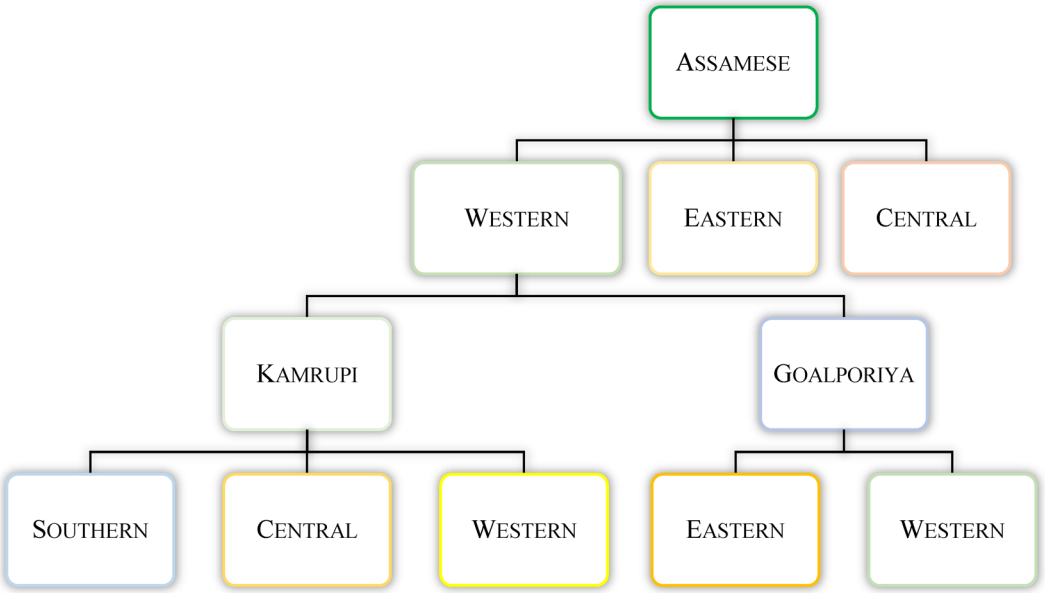


Figure 1-1 The flow chart shows how Assamese language can roughly be divided into western, eastern and central group of dialects, out of which, the western group can further be classified into Kamrupi and Goalporiya group of varieties *(Konwar, 2013; Goswami & Tamuli, 2003)*.

In the present study, we study and compare the intonational phonology of two varieties of Assamese, namely Standard Colloquial Assamese (henceforth SCA) and Nalbariya variety of Assamese (henceforth NVA). As can be seen in Figure 1-2[2] (Dalet, 2017), SCA belongs to the eastern group of dialects, spoken mainly in the districts of Sivasagar and Lakhimpur (Goswami & Tamuli, 2003), whereas NVA, which is spoken mainly in Nalbari district is a variety from the Kamrupi group (Moral, 1996a).

[2] The domnonstrated map (Dalet, 2017) does not represent political boundaries. It roughly highlights the areas where different varieties of Assamese are spoken.

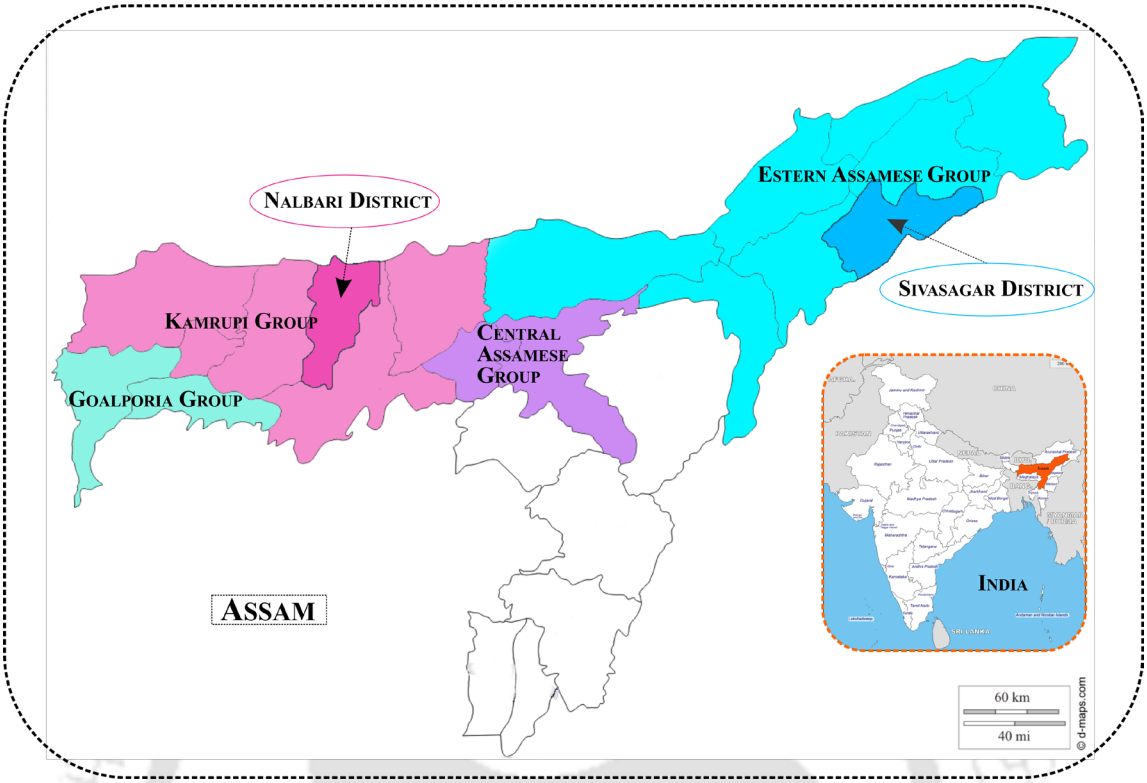


Figure 1-2 The map demonstrates four broadly categorised groups of dialectal variation of Assamese. The pink and the blue portion represent the Kamrupi and the Eastern Assamese group of dialectal varieties respectively. Data were collected from the districts of Nalbari and Sivasagar. These districts belonged to the Kamrupi and the Eastern Assamese dialectal areas.

The speech communities speaking SCA and NVA are geographically cut off from each other by the region where the central group of Assamese dialects are spoken. The two variants demonstrate segmental, intonational, morphological, and lexical differences, which at times cause mutual incomprehensibility across the speech communities (Goswami, 1982; Goswami & Tamuli, 2003). Since the thrust of the present study is on post-lexical prosody and its role in highlighting contrastive focus (henceforth CF) in SCA and NVA, the concentration will be on the intonational aspect only without going into morphological and vocabulary differences. Goswami and Tamuli (2003) very briefly state that intonational patterns across Assamese dialectal groups are different, and the *Western dialects* (both Kamrupi and Goalparia group in Moral (1992)) demonstrate very fast and forceful *speech tempo* in contrast to the *Eastern Asamiya* (Eastern Assamese) in which it is rather slow. However, the authors do not endorse their statement with substantial

evidence from rhythm and speech tempo of the two varieties. In the present study, we have investigated the intonational differences between the two dialectal groups with specific reference to CF realisation in SCA and NVA.

Assamese as a head final language falls into the typology of most other South Asian languages (henceforth SALs) like Bengali (Hayes & Lahiri, 1991; Khan, 2008), Hindi (Patil, et al., 2008; Genzel & Kügler, 2010), Tamil (Keane, 2014), etc. where declarative utterances culminate with a verb.

1.7 Intonational phonology of few other SALs

Adopting the AM model, several studies have been carried out in SALs by researchers, few of them like Bengali, Hindi and Tamil have been discussed below

1.7.1 Bengali

Hayes and Lahiri (1991) and Khan (2008; 2014) carried out remarkable studies on Kolkata and Bangladeshi varieties of Bengali respectively. While Hayes and Lahiri's approach was more of prosodic phonologists', Khan investigated the post-lexical prosody as an intonational phonologist.

1.7.1.1 Hayes and Lahiri (1991)

According to the authors, an IP in Bengali is composed of P-phrases, which are phonological domains and often characterised by pitch accents and boundary tones. Adopting the British school model, Hayes and Lahiri divided P-phrases into two categories, nucleus and head. In an IP, the nucleus is "the main stressed syllable plus everything after it" and the head is "everything before the main stressed syllable". In declarative IPs, non-final P-phrases categorised as heads are specified by L*H$_P$ pitch pattern, and the final P-phrase bearing the nuclear stress on its leftmost syllable is designated by H* pitch accent demarcated by L% IP boundary tone. The author duo further proposed that focused constituents are designated by L*H$_P$ pitch configuration. These constituents form the rightmost P-phrase and bear the IP nuclear pitch accent on their leftmost syllable.

1.7.1.2 Khan (2008; 2014)

Khan in his works adopts an intonational approach while describing the prosodic constituents, and analyses IPs into intermediate phrases (ips) and accentual phrases (APs).

An AP is the basic unit of intonation and it is characterised by a pitch accent. APs are always in one-to-one relationship with pitch accents, which are the prosodic heads of APs. Though APs are comparable to P-phrases in Hayes and Lahiri (1991), they are different in terms of their relationship to pitch accents. While "every AP must host exactly one pitch accent", in case of P-phrase, this is not a compulsion. Khan proposes another domain between IP and AP i.e. the domain of ip. An ip is a concatenation of "APs typically forming a tight syntactic unit, such as the topicalized element, a postpositional phrase, or an adverbial" (Khan, 2014, p. 88). Focused constituents are assigned the bitonal pitch accent L*+fH on the leftmost syllable without any intonational demarcation of the right edge of such constituents.

1.7.2 Hindi

The studies carried out on Hindi intonational phonology reveal that the language demonstrates rising pitch contour on the non-final constituents and a fall on the final constituent (Harnsberger, 1994; Patil, et al., 2008; Féry, 2010). The non-final P-phrases are designated with an initial L* pitch accent and a following high tone. Although Patil, et al. (2008) considered the high tone as an edge tone, Harnsberger (1994) acknowledged the possibility of it being either a boundary or a trailing tone. Alternatively, Féry (2010) attributed these phrases with L_PH_P pitch pattern. The final constituent has been described by Patil, et al. (2008) to bear H^*L_I tones and by Féry (2010) to bear H_PL_I tones. In Hindi, focus has a phrasing effect on the focused constituent (Moore, 1965) in that the focused constituent forms an independent P-phrase.

1.7.3 Tamil

Elinor Keane (2014), studied the post-lexical prosody of Tamil from an intonational perspective and analysed it into IPs and APs. According to her, whether an AP in Tamil may correspond to "a single lexical word or a small phrase" depends upon the lexical or grammatical information the phrase contains or even upon the speaker's choice. She has also reported occurrences of double rise in some APs which motivated her to propose L*(HL)H as the tonal pattern for Tamil APs. The HL in parenthesis shows up "under pressure from rhythmic considerations or morphological complexity" (Keane, 2014, p. 133). One or more APs constitute an IP, which is characterised by a final boundary tone, is a "domain of declination". As far as focus manifestation in Tamil is concerned, identical

to Bengali (Hayes & Lahiri, 1991) and Hindi (Patil, et al., 2008), the focused constituent obligatorily constitutes an independent AP of its own.

1.8 LH melody in SALs

All the SALs discussed above are characterised by non-final LH melody, which initiates repeated rising contours (Keane, 2014, p. 129; Khan, 2016) on non-final prosodic constituents in IPs. The L tone associates phrase initially, whereas the H tone is manifested finally. The former has been claimed as a prominence lending pitch accent (L*) in Bengali (Hayes & Lahiri, 1991; Khan, 2008), Hindi (Harnsberger, 1994; Patil, et al., 2008) and Tamil (Keane, 2014) which is associated with the lexically most prominent syllable in a P-phrase or AP. The H tone, on the other hand, has been treated differently either as a boundary tone or as a trailing tone. Hayes and Lahiri (1991) proposes H tones as boundary tones that align with the prosodic boundary of P-phrases, whereas Khan (2008, 2014) admits the possibility of H tone being a phrase tone (Ha) or a part of a complex pitch accent L*+H. In case of Tamil, Keane (2014) finds it inconclusive to claim the H tone either as a boundary tone or as a trailing tone though she eventually assumes the tone as a boundary tone due to lack of evidence in support of it being a trailing tone.

Féry (2010) alternatively proposes a uniform intonational model for all the SALs (especially Hindi, Bengali, Tamil and Malayalam) categorising them as phrase languages, which lack prominence at the post-lexical level. She acknowledges that the SALs demonstrate an LH melody, and since these languages have "no pitch accent, no lexical tone", this melody comes from two phrase tones associated to the edges of prosodic constituents. According to her, L marks the beginning and H designates the ending of non-final P-phrases. Thus she proposes for an L_PH_P tonal pattern for non-final prosodic phrases as against L^*H_P or L*Ha proposed by other researchers such as Hayes and Lahiri (1991), Khan (2008), Patil, et al. (2008) and Keane (2014) among others.

Contradicting the uniform representation of all SALs with the help of a single model, Khan (2016) undertakes a comparative study, which studies six SALs: Assamese, Bengali, Hindi, Nepali, Tamil and Telugu. He finds the attempt to describe all SALs with a single model inadequate inadequate since such a model cannot capture the phonological

variations seen across SALs. For instance, in Hindi L of the LH melody can be non-initial[3] when the lexical prominence is not on the first syllable. The H tones are not always found right aligned to P-phrase boundaries; while in Hindi, H is right aligned to P-phrases, in Bengali it may be realised as the tail of a complex pitch accent.

The present study assumes that the two varieties of Assamese fall in the typology of other SALs and demonstrate LH melody on non-final P-phrases.

1.9 Outline of the dissertation

CHAPTER 1

Introduction: The chapter introduces the topic of this dissertation along with the motivation behind carrying out the study. Subsequently, a historical overview has been given regarding how the study of intonation evolved theoretically. After briefly introducing the ToBI transcription system and the concept of focus, the chapter ends with an outline of how the chapters are arranged in the dissertation.

CHAPTER 2

Lexical prominence: In this chapter, the lexical prominence pattern in SCA and NVA is illustrated in terms of the metrical theory of stress assignment. How the *rhythmic* categories such as foot, syllable and mora are arranged together to form a P-word has also been discussed. Since literature on SCA lexical prominence is already available, a production experiment was conducted to investigate word level prominence in NVA. The lexical prominence pattern is investigated and reported because as per the AM model, while boundary tones are realised on prosodic boundaries, pitch accents associate with the metrically prominent syllables.

CHAPTER 3

SCA and NVA intonational patterns: This chapter discusses the intonational and prosodic structure of the two studied varieties of Assamese as per the AM model. It further demonstrates the tonal inventory of SCA and NVA derived from different sentence types such as declaratives, interrogatives, yes/no questions, etc. with the help ToBI transcription

[3] Hayes and Lahiri (1991, p. 79) also reports such non-initial assignment of low pitch accent L* in P-phrases. This happens when the P-phrases initial word is a clitic-like functional word.

system. Various domains in the prosodic hierarchy tree, P-word < P-phrase < IP have been illustrated with relevant examples.

CHAPTER 4

SCA contrastive focus (CF): The chapter begins with an introduction to the concept of CF and its cross-linguistic realisation. The prosodic aspect of CF manifestation in SCA is discussed in detail with reference to intonational as well as segmental cues. The investigation reports a two sided demarcation of the focused constituent followed by a complete pitch range compression. The claims made in this chapter are supported by an instrumental experiment conducted on SCA data which establishes pitch range and duration as significant cues to CF in the variety.

CHAPTER 5

NVA CF: This chapter concentrates on illustrating the phonology and phonetics of CF realisation in NVA. The first part of the chapter describes how CF phonology demarcates the left edge of the focused constituent, and groups the post-focus constituents within the P-phrase engendered by CF. The post focus constituents have been proposed in the chapter to undergo dephrasing. The second part of the chapter reports an experiment conducted to investigate the phonetic cues to CF in NVA.

CHAPTER 6

Morphological focus (MF) in SCA: The intonational representation of MF prosody in SCA constitutes the core of this chapter which is followed by a phonetic description of how MF is manifested in the variety. Apart from discussing the morphological focus markers (henceforth MFMs), the chapter illustrates their distribution in the variety. The final part of the chapter reports an experiment conducted to observe the phonetic cues to MF in SCA. It has been proposed that MFMs form P-phrases together with their host following which the post-focus constituents undergo pitch range compression.

CHAPTER 7

MF in NVA: In this chapter, the phonology of MF realisation has been discussed with reference to NVA data. It has been proposed here that in NVA, the constituent hosting an MFM dephrases the constituents following it, and thus initiates a consolidated P-phrase

containing the focused plus post-focus sequence. The chapter concludes with the reporting of an experiment conducted to examine the phonetic cues to MF in NVA.

CHAPTER 8

Comparison of focus realisations in SCA and NVA: This chapter is comparative in nature which provides a consolidated sketch of focus realisation in the two studied varieties. Both CF and MF realisations have been briefly illustrated with the help of intonational contours and various segmental processes.

CHAPTER 9

Conclusion: The concluding chapter in the dissertation sums up all other chapters preceding it. It further underlines briefly the limitations of the present study and discusses the scope for further research in the area.

Chapter 2 Lexical Prominence in SCA and NVA

2.1 Introduction

This chapter investigates the prosodic structure and prominence pattern in SCA and NVA at the lexical level. As proposed in the works by Selkirk (1980), Prince (1983), Hayes (1987), Kager (1993), McCarthy (2006), a lexical word is analysable into syllable, foot and mora. These researchers further showed that these units maintain an intrinsic recurring speech rhythm in each of their occurrences. Motivated by the rhythmic nature of the units below the word level, Ito and Mester (2012) categorised them as *rhythmic categories*. In SCA and NVA, we propose that a word can be analysed into foot (feet), which is analysable into syllable(s), and which in turn into morae. This further implies that rhythmic categories maintain a hierarchical structure as described in (1).

(1) Word
↓
Foot (F)
↓
Syllable (σ)
↓
Mora (μ)

In this chapter, the word internal structure of the two varieties of Assamese has been discussed with reference to the hierarchy displayed in (1), and the prominence pattern within a word is illustrated in terms of the metrical theory of stress assignment. In §2.2, metrical phonology has been discussed with reference to various proposals postulated by different phonologists which have been instrumental in the development of metrical theory. §2.3 is divided into two parts – the first part talks about SCA lexical prominence pattern and the second part elaborates on the rhythmic categories in NVA. The discussion on SCA lexical prominence is based on the conclusions drawn by Mahanta (2001), and the assumptions regarding NVA word level prominence pattern are based on the data collected separately from Nalbari district of Assam. §2.4 reports experiments conducted to investigate phonetic cues to prominence in NVA di- and trisyllabic words. The chapter ends with concluding remarks in §2.5 comparing SCA and NVA lexical structure and prominence.

2.2 Metrical phonology

Before the emergence of metrical theory of stress assignment, structuralists and generativists held stress to be identical to distinctive features such as [± nasal] or [± coronal], and attempted to define it in absolute terms. Structuralists, such as Trager and Smith (1957) and Newman (1946) classified stress into four categories with regards to the inherent loudness level of syllables (Loots, 1980). Chomsky and Halle (1968), on the other hand, attempted to lend uniformity to their theory by treating stress equivalent to other features such as [± nasal]. By doing so, they "repeated the same sort of mistake made by the structuralist conception of stress as a phoneme analogous to [p]" (Kenstowicz, 1994, p. 549). They proposed a set of rules which are applied cyclically to arrive at the desired stress pattern in English; however, their proposal suffered serious drawbacks when applied cross-linguistically (Liberman & Prince, 1977; Hayes, 1980).

Rischel (1972), in his study of stress in Danish, proposed against the cyclic assignment of stress rules and ushered in the possibility of analysing stress pattern with the help of a hierarchical tree. Later, in their seminal work, Liberman and Prince (1977) extensively demonstrated that a syllable is stressed or prominent only in relation to other syllables around it, and rejected the view that it is an absolute feature as speculated by structuralists and generativists. In order to illustrate the relative prominence pattern, Liberman and Prince adopted explicit tree structures, which maintain binary branching. In a binary branching tree, a pair of sister nodes are labelled either as *strong* (s) or *weak* (w) depending upon the relative strength of one node over the other. For instance, in (2), the syllables dominated by 's' node are stronger than the syllables dominated by 'w' nodes.

(2) a) football b) abstain

This kind of labelling explicitly demonstrates that stress is not a primitive content feature; a particular syllable dominated by 's' is prominent only in relation to a syllable dominated by 'w' node. There is no point in ascribing 's' or 'w' node to a syllable occurring in isolation. For instance, in (2a) the word initial syllable *foot* of *football* is stronger only in relation to *ball*, and in (2b), the word final syllable *stain* is prominent in comparison with the word initial syllable *ab*.

2.2.1 Word internal prosodic categories

Metrical phonology, apart from illustrating the prominence relationship among constituents, prepares the ground for the development of word internal prosodic categories such as metrical feet and morae. Although Liberman and Prince (1977) proposed for a relative prominence structure in their study, they could not completely get rid of the segmental feature [± stress]. They retained the feature [± stress] in order to confront some prominence distinctions in English which the simple mode of metrical tree cannot handle (Hayes, 1980). For instance, in the pairs of words *banana* and *bandanna*, and *Panama* and *Pamela*, the syllables demonstrate identical prominence ranking.

(3) a) bandanna banana b) Panama Pamela

However, the degree of stress that differentiates the initial syllables of *bandanna* and *banana* and the final syllables of *Panama* and *Pamela* is not captured in the metrical trees given in (3). In order to address this problem, Liberman and Prince (1977) retained the segmental feature [± stress] with *a greatly reduced role*[4], and remodeled the tree as displayed in (4).

(4) a) bandanna banana b) Panama Pamela

While Liberman and Prince (1977) talked about the possibility of eliminating the feature [± stress], Prince (1980) and Selkirk (1980) proposed *metrical feet* in support of replacing [± stress] by. According to them, metrical feet refer to the subtrees constructed by each iteration of the stress rule which can explain stress differentiation among syllables apart from demonstrating their prominence pattern. Hayes (1980) demonstrates the words given in (4) again after removing the feature [± stress] from the metrical tree, and incorporating *feet* into it. This new representation has been given below:

[4]Earlier, the segmental feature [stress] was given multiple values: [ˊ, ˆ, ˋ and ˇ] by Trager and Smith (1957) and [1, 2, 3 and 4] by Chomsky and Halle (1968). In Liberman and Prince (1977), the scope of the feature [stress] was greatly reduced, and it was limited to only binary (±) values.

(5) a) bandanna banana b) Panama Pamela

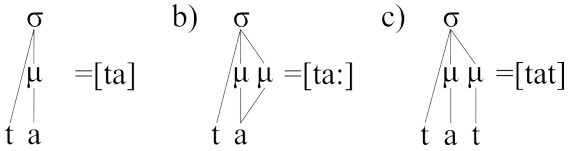
According to this representation, while each foot has its own stressed syllable, only that syllable in a word emerges as the strongest syllable which is dominated by the strongest foot. For instance, in (5a) *ba* of *banana* constitutes the weaker node of the foot dominating the stressed syllable, while word initial *ban* of *bandanna* constitutes an independent foot. This explicates the different degree of prominence on the first syllables of the two words without incorporating the segmental feature [± stress]. The same is true for the final syllables of the two words given in (5b).

In the subsequent studies (Selkirk, 1980; Prince, 1983; Hyman, 1984; Hayes, 1987; McCarthy, 2006), *mora* was introduced as the basic unit of syllable weight. It was illustrated in these works that in quantity sensitive languages, syllables with two morae are considered heavier than the ones with one. With the introduction of mora into the metrical theory, the hierarchy demonstrated in (1) becomes complete.

2.2.2 Moraic theory and syllable structure

In the present study, we adopt the moraic theory of syllable structure, which was developed in a series of papers in the 80s and the 90s: Prince (1983), McCarthy and Prince (1986/1996) and Hayes (Hayes, 1987; 1989a). This theory marks a radical departure from *segmental* theories such as CV theory (McCarthy, 1979) and X theory (Levin, 1985), which intuitively takes segments under consideration. Moraic theory, instead of going for a segmental representation of syllabic prominence, relies on the traditional concept of *mora*. According to this theory, a syllable is heavy or light depending upon the number of mora (morae) it has: a monomoraic syllable is a light syllable and a bimoraic syllable is a heavy syllable. Hayes (1989a, p. 254) schematically represents few syllable patterns in accordance with the moraic theory he proposes (6).

(6) a) b) c)

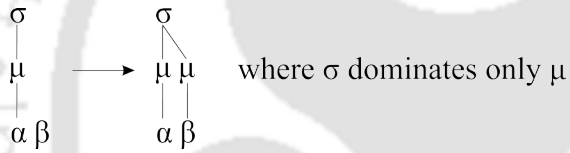


Through (6) he depicts clearly how mora and segment do not necessarily maintain a one to one relationship. The syllable in (6a) is a light syllable since it contains only one

mora, whereas (6b) and (6c) are heavy syllables on account of their bimoraic content. The schema in (6b) and (6c) also illustrate how CVV and CVC syllables are different from each other in terms of segmental associations, not in terms of moraic configuration; different association lines have been used in order to demonstrate this difference.

Depending upon the parametric preference, languages may vary in their speculation of heavy syllables. As opposed to Latin syllable patterns with CV as light and CVV and CVC as heavy syllables, there are languages like Huasteco Mayan (Hyman, 1977) and Tiberian Hebrew (McCarthy, 1979) which place CV and CVC syllables into the category of light syllables and only consider CVV as heavy syllables. Hayes addresses this distinction between weight pattern typologies with the formulation of a rule, which he termed as *Weight by Position* rule. This rule states that the languages with CVC as heavy syllable obey Weight by Position rule, which accommodates certain coda consonants with a mora. He schematised the rule as given in (7).

(7) *Weight by Position*



Languages like Latin render closed syllables heavy i.e. coda consonants in such syllables are given a mora, whereas in Languages like Lardil and Tiberian Hebrew, the Weight by Position rule is not effective. In the next section, we discuss the cross-linguistically attested metrical inventory.

2.2.3 The universal foot inventory

As it has been reported by Hayes (1980) and Hulst (1995), Vergnaud and Halle (1979) demonstrate the applicability of Liberman and Prince's (1977) theory as a parametric theory of stress systems. According to the authors, the algorithm used by Liberman and Prince (1977) for the analysis of English is one of the many possible algorithms found cross-linguistically. While discussing the metrical inventory of Assamese, the present study will adhere to several influential studies such as Hayes (1985; 1987; 1995), McCarthy and Prince (1986/1996), Prince (1990), and Kager (1993). All these studies will be discussed briefly in this section with reference to their contribution in the development

of the Iambic-Trochaic Law (henceforth ITL). Hayes articulates the said law as given in (8).

(8) *The Iambic-Trochaic Law* (Hayes, 1985; 1987)

a. Elements contrasting in intensity naturally form groupings with initial prominence.

b. Elements contrasting in duration naturally form groupings with final prominence.

Based upon the ITL given in (8), Hayes (1987) proposed the following cross-linguistic foot inventory.

(9) a. *Quantity-insensitive*

Syllabic trochee (σ σ)

b. *Quantity-sensitive*

i. Moraic trochee (L L) or (H)

ii. Standard iamb (L σ) or (H)

In the above schema, however, by including only trochaic feet in the quantity insensitive category, Hayes failed to capture quality-insensitiveness of several iambic languages such as Paurmari and Suruwaha (Hyde, 2011). McCarthy and Prince (1986/1996) proposed a slightly different foot inventory, which categorised quantity-sensitive and -insensitive feet into balanced and unbalanced templates (10).

(10) a. *Quantity-insensitive*

Balanced [σ σ]

b. *Quantity-sensitive*

i. Balanced [μ μ]

ii. Unbalanced [σ_{μ} $\sigma_{\mu\mu}$]

The authors talk about two principles which these templates (10) propagate. The first principle (11) claims that heavier syllable in quantitatively unbalanced feet bears the stress.

(11) *Quantity/Prominence Homology*

For a, b ∈ F, if a > b quantitatively, then a > b stresswise.

The second principle (12), on the other hand assigns stress to the first component in the balanced foot templates [σ σ] and [μ μ].

(12) *Trochaic Default*

For a, b ∈ F, if a = b quantitatively, then F=[s w].

McCarthy and Prince's principle of *Quantity/Prominence Homology* (McCarthy & Prince, 1986/1996) was further complemented by Prince's (1990) account of *Harmonic Parsing*, which holds that quantity-sensitive systems abide by Weight-to-stress principle (13), whereas quantity-insensitive systems ignore it.

(13) *Weight-to-Stress Principle* (WSP)

If heavy, then stressed.

With reference to quantity-sensitive systems, Prince (1990) further proposes three principles which look after the well-formedness of iambic and trochaic feet. The first principle (14) states that feet in quantity-sensitive systems are either disyllabic or bimoraic.

(14) *Binarity*

Feet should be analysable as binary.

According to Prince, the feet HL, LH, LL meet binary requirement on syllables and the foot [H][5] on morae. It is only [L] that does not meet *Binarity*. In the next two principles (15) and (16), Prince (1990) summarises the two ITLs given in (8) where |X| means "the size of X".

(15) *Iambic Quantity* (IQ).

In a rhythmic unit [W S], |S| > |W|, preferably.

(16) *Trochaic Quantity* (TQ).

In a rhythmic unit [S W], |S| = |W|, preferably.

The principles refer to how iambic feet (15) preferably maintain durational contrast as opposed to trochaic feet (16) where durational contrast is preferably not maintained. All these principles result in a hierarchy of well-formed trochaic and iambic feet as displayed in (17).

(17)

Trochees:	$[\sigma_{\mu\mu}]$, $[\sigma_{\mu}\,\sigma_{\mu}]$	>	$[\sigma_{\mu\mu}\,\sigma_{\mu}]$	>	$[\sigma_{\mu}]$		
Iambs:	$[\sigma_{\mu}\,\sigma_{\mu\mu}]$	>	$[\sigma_{\mu\mu}]$, $[\sigma_{\mu}\,\sigma_{\mu}]$	>	$[\sigma_{\mu}]$	(Kager, 1993)	

[5] In this chapter, L designates light and H designates heavy syllables. In the next chapter onwards, L and H will be used for low and high tones respectively.

The above hierarchy demonstrates trochees' preference for balanced [$\sigma_{\mu\mu}$] and [$\sigma_{\mu}\,\sigma_{\mu}$] to unbalanced [$\sigma_{\mu\mu}\,\sigma_{\mu}$], and iambs' preference for unbalanced [$\sigma_{\mu}\,\sigma_{\mu\mu}$] to balanced [$\sigma_{\mu\mu}$], [$\sigma_{\mu}\,\sigma_{\mu}$] (see (10) for details). As opposed to the asymmetric foot inventory propagated in ITL, a symmetric foot inventory was proposed by Kager (1993) which was based on the metrical principles of clash and lapse avoidance (18).

(18) a. *Clash*: two adjacent stressed elements.
b. *Lapse*: two adjacent stressless elements.

In the next section, SCA and NVA word level prominence pattern will be discussed from the perspective of metrical phonology discussed briefly until this point.

2.3 Prominence pattern in SCA and NVA

This section discusses word level prominence pattern of SCA and NVA which has been developed in two sub-sections: the first part recapitulates briefly the findings of Mahanta (2001) with regards to SCA lexical prominence pattern, and the second part illustrates, previously unstudied, NVA prominence structure based on the data collected from Nalbari district. Before going into the discussion on the prominence pattern of the two varieties, the vowel inventories and attested syllable types of the varieties have been concisely illustrated below.

2.3.1 SCA and NVA vowels

The varieties differ from each other with respect to the total number of vowels: NVA has seven pure vowels (Goswami, 1958; Deka, 2007) as against SCA's inventory of eight vowels (Goswami, 1982; Goswami & Tamuli, 2003; Mahanta, 2007). As demonstrated in Table 2-1, in NVA the back, mid (half-open) unrounded vowel [ʊ] is absent.

Table 2-1 Comparison of Vowel inventories of SCA and NVA.

Sl no	Symbol	Description	SCA	NVA	Gloss
1	[i]	Front, high unrounded	[bil]	[bil]	small lake
2	[e]	Front, mid unrounded	[bel]	[bel]	*bell* (English)
3	[ɛ]	Front, low unrounded	[bɛl]	[bɛl]	a kind of fruit
4	[a]	Back, low unrounded	[bal]	[bal]	child
5	[ɔ]	Back, low rounded	[bɔl]	[bɔl]	strength
6	[o]	Back, mid (half-open) rounded	[bol]	[bol]	let's go
7	[ʊ]	Back, mid (half-close) unrounded	[bʊl]		colour
8	[u]	Back, high rounded	[bul]	[bul]	a proper name

Since, in SCA, vowel length is not phonological, we do not expect a heavy syllable with CVV structure. Assamese lacks phonemic diphthongs, occurrences of phonetic diphthongs are however found in the language (Goswami, 1982). Mahanta (2001) mentions about two types of such diphthongs: (C)GV and CVG.

Table 2-2 Examples of (C)GV and CVG syllable patterns

Sl No	(C)GV	Gloss	Sl. No	CVG	Gloss
1	[aí.u]	*life*	4	[bi.oí]	*relationship between the two fathers-in-law*
2	[baí.u]	*air*	5	[zʊ.aí]	*son-in-law*
3	[ɦeí.a]	*there*	6	[mɔ.eí]	*only me*

Out of the two groups demonstrated in Table 2-2, only CVG has been designated with bimoraic status, whereas (C)GV has been predicted as monomoraic.

In case of NVA, on the other hand, eleven diphthongs have been reported by Goswami (1958), out of which five are closing fronting and six closing backing diphthongs. These diphthongs have been enlisted below:

(19) Diphthongs (NVA)

a. Closing fronting diphthongs

[ei]	→	[dei]	*gives*
[ai]	→	[gai]	*cow*
[ɔi]	→	[bɔih]	*age*
[oi]	→	[soita]	*plate made out of the sheath of plantation tree*
[ui]	→	[zui]	*fire*

b. Closing backing diphthongs

[iu]	→	[ziu]	*life*
[eu]	→	[deul]	*a festival of colour*
[ɛu]	→	[sɛu]	*a piece*
[au]	→	[gau]	*body*
[ɔu]	→	[kɔu.e]	*a kind of fish*

2.3.2 SCA and NVA syllables

With regards to the possible syllable patterns, the two varieties studied here maintain identical structures. Since this chapter is focused on prominence pattern in the varieties, we have avoided describing the possible CV combinations in SCA and NVA. Following the moraic theory of syllable weight, we argue that in Assamese, monomoraic syllables are light, and bimoraic syllables are heavy constituting Group A and Group B respectively in Table 2-3.

Table 2-3 Syllable types in SCA and NVA, quantity-wise

SCA		**NVA**	
Group A	**Group B**	**Group A**	**Group B**
CV	(C)VC	CV	(C)VC
CCV	(C)VCC	CCV	(C)VCC
(C)GV	(C)VG	___	(C)VV / (C)G

Table 2-3 reveals that all the syllable patterns in Group A lack coda consonant, while in Group B, the nuclear vowel is either followed by a coda consonant, a vowel (NVA specific) or a glide. In the following sections, lexical prominence pattern in SCA and NVA will be discussed with reference to these syllable patterns: Group A = light and Group B = heavy.

2.3.3 Prominence in SCA: based on Mahanta (2001)

As has been mentioned earlier, the SCA prominence pattern reported here is based on the findings of Mahanta (2001). Initially, the prominence pattern in disyllabic words will be discussed briefly with all the possible syllable patterns which will be followed by a section on secondary prominence. The succeeding section will illustrate how affixes interact with the syllable structure of stems.

In Table 2-4, the prominence pattern in disyllabic SCA words have been demonstrated. Boldface font has been used to designate the syllables attracting prominence in a word. In the table we can see that majority of words bear stress on the first syllable signifying a default word initial prominence.

Table 2-4 Prominence pattern in disyllabic words. Prominent syllables are in boldface.

	Words	**Gloss**		**Words**	**Gloss**
(**L**L)	a. [só.kʊ]	*eye*	(**H**)H	c. [bɔ́n.dɔr]	*port*
→	b. [rá.ti]	*night*	→	d. [án.d^{h}ar]	*dark*
L(**H**)	e. [zi.bɔ́n]	*life*	(**H**)L	g. [gɔ́r.bɔ]	*pride*
→	f. [ba.gán]	*garden*	→	h. [zɔ́n.trɔ]	*machine*

However, in cases where the word initial syllable is light and is immediately followed by a heavy syllable, the latter is provided with the prominence of the word. This is suggestive of the quantity-sensitiveness of SCA which lends prominence to heavy syllables. Mahanta (2001) summarises the prominence pattern of disyllabic words as:

(20) a. The second syllable is prominent if it is heavy and the first syllable is light.

b. Otherwise the first syllable is prominent.

She further draws certain generalisations regarding SCA prominence pattern and syllabification with reference to disyllables.

(21) a. Assamese possesses word initial stress pattern, since it maintains a trochaic rhythm.

b. In Assamese, coda consonants are moraic which lend prosodic weight to closed syllables: VC/ CVC/ CVCC. As a consequence, all heavy syllables are stresses in the language. It is only in a sequence of two heavy syllables that the second syllable is rendered stressless as a measure to avoid stress clash. This avoidance of stress clash helps in maintaining the rhythmicity within prosodic words.

After describing primary prominence in disyllabic words, Mahanta (2001) goes on to propose for a word initial prominence pattern even in trisyllabic words. This implies that by default, foot construction starts at the left edge of words. Her claim that stress bearing heavy syllables never occur beyond the second syllable is in agreement with Goswami's (1982) assertion that *the position of the primary stress is either first or second syllable* of a word. The moraicity assigned to coda consonants lend prominence to closed syllables in SCA words, since SCA obeys Weight-by-Position rule. As far as secondary prominence is concerned, in trisyllabic words, it can be initiated only by bimoraic syllables. If there is any possibility of stress clash due to co-occurrence of two heavy syllables, the second syllable is left unfooted. The following table is based on the examples given in Mahanta (2001) which contains the possible syllable combinations in SCA trisyllabic words.

Table 2-5 Primary and secondary prominence pattern in trisyllabic words. Prominent syllables are in boldface.

	Words	**Gloss**		**Words**	**Gloss**
(**L**L)L →	a. [gɔ́.hɔ.na]	*jwellery*	(LL)(**H**) →	c. [mɔ́.rɔ.mɔ̀r]	*loved*
	b. [zɔ́.hɔ.ni]	*cholera*		d. [zá.za.bɔ̀r]	*vagabond*
L(**H**)L →	e. [a.nɔ́n.dɔ]	*happiness*	L(**H**)H →	g. [a.rɔ́m.bɔr]	*luxury*
	f. [gu.rút.tɔ]	*importance*		h. [ɔ.hɔ́ŋ.kar]	*pride*
(**H**)H(**H**) →	i. [ɔ́n.tɔr.d^{h}àn]	*disappear*	(**H**)LL →	j. [bɔ́n.dɔ.na]	*worship*
(**H**)HL →	k. [bón.d^{h}ut.tɔ]	*friendship*	(**H**)L(**H**) →	m. [án.dʊ.lɔ̀n]	*agitation*
	l. [ɔ́s.tit.tɔ]	*entity*		n. [gɔ́n.dɔ.gʊ̀l]	*confusion*

As stated in Table 2-5, SCA, while parsing in strict Binarity, avoids stress clash at the syllable level, and thus accommodates only two light syllables (**L**L) or one heavy syllable (**H**) in one foot. As such, two successive heavy syllables *(**H**H) or sequences of light and heavy syllables *(L**H**) or heavy and light syllables *(**H**L) are never accommodated in one foot. The stress pattern in SCA trisyllabic words can be stated as below:

(22) a. The second syllable is prominent if it is heavy and the first syllable is light.
b. Otherwise, the first syllable is prominent.
c. Final closed syllables bear secondary prominence if the preceding syllable is not prominent.

In SCA words with longer sequences of syllables (quadrisyllabic and pentasyllabic), primary and secondary prominence obeys an iterative binary parse of syllables. However, the tendency to avoid stress clash at the syllable level may render two consecutive syllables without the formation of foot, as it is in case of L(**H**)LL. The possible syllable sequences in quadrisyllabic and pentasyllabic have been demonstrated in Table 2-6.

Table 2-6 Possible prominence patterns in quadrisyllabic and pentasyllabic words

Quadrisyllabic words			
a.	(**L**L)(**L**L)	b.	(**L**L)L(**H**)
c.	L(**H**)L(**H**)	d.	L(**H**)LL
e.	(**H**)LL(**H**)	f.	(**H**)L(**L**L)
g.	(**L**L)(**H**)H	h.	(**H**)H(**L**L)
i.	(**H**)L(**H**)L	j.	(**L**L)(**H**)L
Pentasyllabic words			
a.	(**L**L)(**L**L)L	b.	(**L**L)L(**H**)L
c.	(**H**)L(**L**L)	d.	(**H**)L(**L**L)L
e.	(**L**L)(**H**)LL	f.	(**L**L)L(**H**)H

Mahanta (2001) made the following predictions with regards to the distribution of prominence in words with longer sequences of syllables:

(23) a. The direction of trochaic foot construction is from left to right. As such, in a sequence of light syllables, the leftmost syllable is assigned the primary prominence and each odd numbered syllable from the left is allotted secondary prominence. This leads to the following stress distribution:

i. (ˈ**L**L)(ˌ**L**L) ii. (ˈ**L**L)(ˌ**L**L)L iii. (ˈ**L**L)(ˌ**L**L) (ˌ**L**L)

b. In sequences, where the second syllable is heavy and hence bimoraic, foot construction begins on the second syllable.

c. Every heavy syllable is self-sufficient to form a foot unless it is preceded by another heavy syllable.

d. Two adjacent syllables cannot be stressed; they respect stress clash.

e. The left-most foot is the head foot since it bears the primary prominence.

Further, while observing the relationship between affixation and foot construction, Mahanta (2001) reports that in SCA, feet do not respect morpheme boundary. As a consequence, after morphological processes like affixation, prominence is assigned to

syllables following the paradigm sets given in Table 2-4, 2-5 and 2-6. Table 2-7 demonstrates how affixation and compounding reinitiates syllabification. In the table, (a) *ɦɔman* (equal) is a L(H) type word where the second syllable constitutes a foot; when this word is preceded by the negative prefix ɔ (un-), it undergoes re-syllabification, and we get a new feet structure (b). Same is true for (e) *bɔ́nkukùra* (jungle fowl), where the first *ku* of *kukura* (chicken) is left unfooted which otherwise receives prominence as in (d).

Table 2-7 Syllabification after morphological processes such as affixation and compounding.

	Word	**Gloss**
a)	[ɦɔ.(mán)$_{Ft}$]$_{w}$	'equal'
b)	[(ɔ́ # ɦɔ)$_{Ft}$.(màn)$_{Ft}$]$_{w}$	'unequal'
c)	[(bɔ́n)$_{Ft}$]$_{w}$	'jungle'
d)	[(kúku)$_{Ft}$.ra]$_{w}$	'chicken'
e)	[(bɔ́n)$_{Ft}$ # ku.(kùra)$_{Ft}$]$_{w}$	'jungle fowl'

2.3.4 Prominence in NVA

As it has already been discussed in §3.1 and §3.2, NVA forms a homogenous group together with SCA as far as vowel inventory and possible syllable structure are concerned. Further, the foot formation rules in this variety obey the same patterns illustrated in §3.3 with respect to SCA. They will not be repeated here to avoid redundancy. As far as stress assignment rules are concerned, similar to SCA, NVA avoids stress clash at the syllable level (cf. §3.3). However, there are certain word internal phonological processes taking place in NVA which besides setting the variety apart from SCA, augment word initial prominence. These processes include addition and deletion of sounds, and diphthongisation, which result in heavy word initial syllables. Perhaps, this initial heaviness in *Kāmrūpī* varieties motivated Kakati (1941, p. 16) to claim that *[t]he word-stress in the Kāmrūpī dialect is uniformly and dominantly initial*. This has been further confirmed by Goswami (1958, p. 3) when he posits that in *Kāmrūpī* (and hence NVA) stress *is predictable and hence it is non-phonemic*. The processes resulting in word intial prominence have been discussed below.

2.3.4.1 Addition and deletion of sounds

There are various phonological processes discussed in Goswami (1958) that lead to vowel deletion in initial and medial positions in *Kāmrūpī* dialects. This deletion leaves the first syllable with a coda consonant, and hence two morae. Few of these processes have been mentioned below.

2.3.4.1.1 Aphaeresis

Aphaeresis is the process of 'dropping of initial vowels and syllables for want of stress' (Kakati, 1941, p. 97). Goswami (1958) cites the following examples from *Kāmrūpī* varieties which are compared against their Old Indo Aryan (henceforth OIA) counterparts.

(24)	*Kāmrūpī*	Gloss	OIA
	[an.d^{h}u]	*soot*	[a.lɔn.d^{h}u.ma]
	[du.mɔ.ru]	*fig*	[u.dum.ba.ra]
	[d^{h}ar]	*loan*	[ud.d^{h}a.rɔ]
	[pɔr]	*other, not own*	[ɔ.pɔ.rɔ]

2.3.4.1.2 Prothesis

It is a process in which an extra sound is inserted initially in a word (Crystal, A Dictionary of Linguistics and Phonetics, 2008). In NVA, prothesis is adopted in order to avoid producing word initial consonant clusters, which are difficult to articulate. This happens predominantly in case of borrowed words.

(25)	*Kāmrūpī*	Gloss	English
	[is.kul]	*school*	[sku:l]
	[is.ti.sɔn]	*station*	[stei.ʃən]
	[is.pi.sal]	*special*	[spɛ.ʃəl]

2.3.4.1.3 Contact of consonants

There is another phenomenon called *consonant in contact* found in the Kamrupi varieties. Kakati asserts that 'within the limit of a word there is hardly anything like contact of consonants in the' [SCA]. (Kakati, 1941, p. 173). Goswami (1958, p. XIII) mentions that in the Kamrupi varieties, the word medial consonants always come in contact with each

other since the vowels are rarely pronounced in word medial position. This leaves the word with an initial heavy syllable. Few of the examples have been cited below.

(26)	*Kāmrūpī*	Gloss	SCA
	[puk^{h}.ri]	*pond*	[pu.k^{h}u.ri]
	[sɔk.la]	*slice*	[sɔ.kɔ.la]
	[kɔt.ri]	*knife*	[kɔ.ta.ri]

2.3.4.2 Diphthongisation

Apart from the processes discussed above which are instrumental in initiating the trochaic rhythm on the very first syllable, there is another process called diphthongisation. The said process initiates stress on the first syllable or maintains the iterative trochaic rhythm through a word. Sometimes, *metathesis* results in the creation of diphthongs in NVA. For instance,

(27)	*Kāmrūpī*	Gloss	SCA
	[kai.za]	*quarrel*	[ka.zi.ja]
	[nair.kɔl]	*coconut*	[na.ri.kɔl]
	[xail.k^{h}a]	*myna*	[xa.li.ka]

Such kind of diphthongisation has also been reported by Goswami (1958, p. 48) in case of some disyllabic *Kāmrūpī* words when they are compounded with other words. These words otherwise do not undergo epenthesis[6]. This is also applicable to NVA.

(28)	Base	Gloss	but	Compound	Gloss
	[pani]	*water*	but	[pain-tapa]	*the drop of water*
	[bati]	*cup*	but	[bait-tu]	*the cup*
	[tuli]	*raise*-PER	but	[tuil-d^{h}ɔr]	*raise up*
	[xuni]	*hear*-PER	but	[xuin-t^{h}ak]	*keep listening*

Further, diphthongisation may also take place as a consequence of vowel shift from affixes to stems. Few examples have been cited below (Goswami, 1958):

[6] Diphthongisation in disyllabic words is found in Bengali, e.g. *rait* (nigh), *kail* (tomorrow), *aiz* (today), etc. (Goswami, 1958)

(29)

Stem-suffix	Word	Gloss
[zan-iba]	[zainba]	*to know*
[xar-ua]	[xaura]	*fertile*
[sek-ura]	[seukra]	*stain*

Sarma (2009) has reported such diphthongisation in *Barpetia dialect* too. He proposed that affixation replaces pure vowels in the stem by diphthongs. The examples he cited are reproduced below:

(30)

a.	*dʰul-ia*	→	*dʰuila*
	drum-NOM		drummer
b.	*gʰɔr-ua*	→	*gʰoura*
	home-ADJ	→	homely
c.	tel-ia	→	teila
	oil-ADJ	→	flatterer
d.	*dʰar-ua*	→	*dʰoura*
	borrowing-ADJ	→	borrower

Thus it can be seen from the above discussion that NVA in particular and *Kamrupi* varieties in general, demonstrate an inclination towards formation of word initial heavy syllables. This results in word initial prominence which is peculiar to the variety and more robust in comparison with SCA.

2.3.4.3 Metrical prominence

In spite of the above mentioned processes, which result in the formation of heavy syllables, NVA demonstrates a similar metrical prominence pattern to SCA. Identical to SCA, in NVA a heavy syllable or two light syllables can form a foot, i.e. NVA maintains foot binarity at the moraic level. Each foot maintains a trochaic rhythm with the first mora more prominent than the second one. A syllable is considered light if the nuclear vowel is not followed by either a coda consonant or a vowel, whereas in heavy syllables, the nucleus is always followed by another sound: a consonant or a vowel (for details see Table 2-3).

Since NVA maintains a trochaic rhythm, in a sequence of two light syllables forming a foot, the first syllable bears prominence. For instance

(31) [pa.ni] → (**L**L) *water*
[ba.ti] → (**L**L) *cup*

Whenever there is a heavy syllable, it obligatorily forms a foot with an exception to its occurrence following another heavy syllable. Like SCA, NVA also avoids stress clash at the syllable level: no two adjacent syllables can be stressed (32c).

(32) a. [mɔn.trɔ] → (**H**)L *chanting*
b. [dɔ.kan] → L(**H**) *shop*
c. [sɔn.dɔn] → (**H**)H *sandalwood*
d. [$k^hɔ$.ge.nɔr] → (**L**L)(**H**) *Khagen's*

Though heavy syllables are bimoraic and attract prominence, in a sequence of two heavy syllables, the second syllable fails to constitute a foot; it is only the first syllable that constitutes a foot. This avoidance of adjacent stressed syllables is also maintained in words with longer strings of syllables which are formed out of compounding and affixation. Words formed through these processes exhibit vowel shift from affixes to stems resulting in heavy syllables with diphthongs (cf. 29).

(33) a. [dib.ru.gor-ia] → [dib.ru.goi.ra] (**H**)L(**H**)L *from Digrugarh*
b. [dur.ko.pal-ia] → [dur.kɔ.pei.la] (**H**)L(**H**)L *unfortunate*
c. [nɔl.ba.ri-a] → [nɔl.bei.ra] (**H**)HL *from Nalbari*
d. [kam.rup-ia] → [kam.rui.pa] (**H**)HL *from Kamrup*

While during the processes of compounding and affixation such vowel shifts are not seen in SCA, to NVA it adds a distinguishing characteristic. The heavy syllables constructed out of diphthongisation constitute metrical feet. For instance, in (33a) and (33b) the resultant diphthongised heavy syllables constitute feet: *goi* and *pei* of *dibrugoira* and *durkɔpeila* respectively. However, in words where such diphthongisation initiated heavy syllables occur immediately after another heavy syllable, they do not form feet. The heavy syllables *bei* of *nɔlbeira* and *rui* of *kamruipa*, for instance, are left unfooted in (33a) and (33b) respectively, since their immediate preceding heavy syllables form feet.

As far as headedness is concerned, in an NVA word, like it is in SCA, the left-most foot constitutes the metrical head of the word. For instance, though (33a) and (33b) contain two feet each, only the left most foot constitutes the head. The prominence assignment rules in NVA can be summed as follows.

(34) a. NVA maintains trochaic rhythm at the lexical level which is constructed from left to right.
b. Heavy syllables are bimoraic and are capable of forming feet.
c. Whenever there is a sequence of two or more heavy syllables, the second syllable is left unfooted in order to avoid stress class.
d. No two adjacent syllables can be stressed.
e. NVA foot construction is characterised by left-headedness, i.e. the left-most foot is prosodically the head

2.4 Phonetic evidence of NVA prominence

In this section, the phonology of stress assignment in NVA has been substantiated phonetically. It will be argued in this section that prominence in this variety of Assamese is word initial. For this purpose, an experiment was conducted on NVA words with different syllable patterns which has been reported below. However, the discussion is preceded by a brief introduction to the cross-linguistically attested cues of prominence.

2.4.1 Correlates of prominence

There are various correlates to word level prominence which vary cross-linguistically. Sometimes pitch alone can signal prominence as it is in case of *pitch accent* languages like Japanese (Beckman M., 1986). On the other hand, there are *stress accent* (Beckman M., 1986) languages like English (Fry, 1955; 1958) where apart from fundamental frequency, duration and intensity values also serve as phonetic cues to prominence.

Cross-linguistically it has been established that in majority of languages, stressed syllables are longer in duration relative to their unstressed counterpart (Fry, 1955; Beckman M., 1986; Mahanta, 2001). Since the durational increase on the stressed syllable may take place at the vowel, the syllable level, or both, in the experiment discussed below, both of these durational values were measured. The next cue to lexical prominence is that of fundamental frequency (F_0) value. There are many studies (Fry, 1955; 1958; 1964; Bolinger, 1958; Morton & Jassem, 1965), which advocate F_0 as a stronger cue to lexical prominence. Apart from increased duration and pitch value, stressed syllable may also be characterised by an increased intensity value (loudness). In languages like Chickasaw (Gordon, 2004), intensity, along with duration serves as a robust cue to word stress. Keane (2006; 2007) proposed that in Tamil, the post-lexically assigned low tone is anchored by

word initial syllables since such syllables are lexically prominent; duration and intensity are not robust correlates of prominence in the language. Further, in her study on SCA lexical prominence, Mahanta (2001) found duration and pitch as significant cues to word level prominence pattern. Therefore, in the present experiment all the three cues to prominence (duration, F_0 and intensity) were measured in order to establish the phonological predictions made on NVA prominence pattern in the previous section (§3.4).

2.4.2 Methodology

In the experiment, both di-and trisyllabic words with different syllable patterns were recorded. The words were elicited from speakers within a sentence frame in order to avoid any effect of post-lexical prosodic boundaries. They were uttered within the frame (35), where x=target word.

(35)	[moi	x	buli	ko-l-u]
	I	x	that (COMP)	say-PST-1
	I said x			

The final vowel of the preceding word *moi* (I) did not interfere with the prosodic manifestation of experimented words since the speakers maintained a pause after it.

2.4.2.1 Speakers

Seven native speakers were recorded articulating the target words within the declarative sentence frame given in (35). All the speakers formed a homogenous group of male speakers sharing the same age range (20 to 27 years) and language community. They are from the same locality of Nalbari district, Assam. The recording was conducted using a Tascam D-05 PCM recorder at the sampling rate of 44KHz with 16-bit resolution in wav format. Care was taken that sentences were uttered at a normal speech rate and free from any hesitation. The recording took place in a silent and natural setting.

2.4.2.2 Data analysis

After recording, the target words were extracted from the recoded utterances and were segmented at both word and syllable levels in PRAAT (Boersma & Weenink, Praat: doing phonetics by computer [Computer Program], 2016). Using a script, pitch, duration and intensity values were measured for each of the segmented portions. In order to take care of the inter-speaker variation, the extracted values were normalised using the z-score

normalisation method (Disner, 1980; Rose, 1987; 1991). The formula for the method has been given below in (36) (though only pitch value normalisation has been illustrated here, normalised duration and intensity values were derived adopting the same formula):

(36) $F_{0\,norm} = (F_{0\,i} - F_{0\,aver})/s$

Where
- $F_{0\,i}$ = F_0 value of an individual point
- $F_{0\,aver}$ = average of all the F_0 values in a P-phrase
- s = standard deviation of all F_0 values in a P-phrase

The normalised values were analysed for variance with the help of a one-way ANOVA test in StataMP13 (StataCorp, 2013) by taking pitch, duration and intensity values as dependent variables and word length (di- and tri-syllabic) and syllable position as fixed factors.

2.4.3 Findings

The findings of the statistical tests have been reported below with reference to the size of the experimented words (di- and trisyllabic). In both the types of words, only duration value is found consistently significant; pitch and intensity values are not suggestive of NVA lexical prominence pattern.

2.4.3.1 Disyllabic words

As far as the duration value of syllables in disyllabic words are concerned, bimoraic syllables always attract prominence and hence they exhibit greater length. In Table 2-8, it can be seen that heavy syllables always show longer duration in contrast to light or mono-moraic syllables. Since NVA obeys WSP, the heavy syllables are marked by greater duration and hence prominence. Compared to heavy syllables, light syllables always demonstrate shorter duration. In words with LL sequence, the two syllables constitute a trochaic foot, where the first syllable bears the lexical stress. However, in such words the second syllable is significantly longer than the first syllable. This lengthening may be caused by the prosodic boundary these words right align. Since NVA is a quantity sensitive trochaic language, it obeys the principle of Trochaic quantity (16), proposed by Prince (1990) and reproduced again in (37).

(37) *Trochaic Quantity* (TQ).
In a rhythmic unit [S W], |S| = |W|, preferably.

In LL sequences, the two syllables constitute a single foot, and maintain equal weight, however, the prosodic boundary following them lengthens the duration of the final syllable. Apart from the words with the LL sequence, all other words ascribe prominence to heavy (H) syllabled. In Table 2-8, in all other syllable sequences, the durational value of heavy syllables is greater than light syllables. Heavy syllables attract prominence since they form feet. Even in words with HH sequence, the first syllable is significantly longer than the second syllable as it forms a foot.

Table 2-8 One-way ANOVA results comparing duration, pitch and intensity values of syllables in disyllabic words.

	Syllable pattern	1st syllable		2nd syllable		F	p-value
		Mean	Sd	Mean	Sd		
Duration	LL	-.43	.26	-.13	.24	(1, 82) = 29.81	0.00
	LH	-.01	.37	.78	.54	(1, 82) = 60.5	0.00
	HL	1.92	.55	-.42	.40	(1, 82) = 489.4	0.00
	HH	1.66	.48	-.24	.46	(1, 82) = 339.1	0.00
Pitch	LL	-.81	.60	-.05	.60	(1, 82) = 33.11	0.00
	LH	-.74	.39	.07	.56	(1, 82) = 59.47	0.00
	HL	-.66	.52	.57	.61	(1, 82) = 97.82	0.00
	HH	-.57	.46	.41	.59	(1, 82) = 72.11	0.00
Intensity	LL	.078	.73	.32	.86	(1, 82) = 1.95	0.16
	LH	-.46	.73	.03	.42	(1, 82) = 14.56	0.00
	HL	-.20	.70	.01	.86	(1, 82) = 1.60	0.21
	HH	.13	.73	.61	.76	(1, 82) = 8.76	0.00

The assumption in this dissertation is that though in non-final prosodic phrases, low pitch accents are associated with the most prominent syllable in the prosodic phrases, their phonetic alignment with the prominent syllable may not be direct. Thus F_0 minimum, representing low pitch accents in non-final P-phrases, is not phonetically realised always on the most prominent syllable. Cross-linguistically as well, the phonetic alignment of pitch accents and salient points in the segmental string is not always direct (Ladd, 2003). Testifying the assumption of the dissertation, the manifestation of F_0 minimum in a constituent is not always found on the most prominent syllable. As such, in NVA disyllabic words, F_0 values cannot be and are not consistently reflective of the prominence pattern.

Moreover, since the words in the experiment are shorter in length, pitch values may give a misleading phonetic picture of word level prominence. Therefore, low tones in non-final P-phrases though are associated with the leftmost prominent syllable in the phrases, they do not necessarily align with it in terms of F_0 minimum realisation.

In words with L(H) sequence, the heavy syllable derives lexical prominence by virtue of being bimoraic. However, the pitch value on the first syllable is significantly lower than the second syllable ($p<0.05$; $F [1, 82] = 59.47$, $p=0.00$). This low value on the first syllable representing the pitch accent of the phrase is realised on the first syllable is in reality associated with the second syllable. May due to tonal crowding, the low tone which is phonologically associated with the heavy syllable in L(H) sequence, is phonetically realised on the first syllable. In all other syllable sequences, the first syllable manifests the lowest F_0 value on it as per the predicted lexical prominence.

As it is seen in Table 2-8, NVA does not employ intensity as a cue to lexical prominence. Significant or not significant, intensity value is always greater on the second syllable as against the first syllable.

At the level of the vowel, duration value is not indicative of the lexical prominence pattern in NVA since the duration of the first vowel is not always significantly different from the second vowel. This again establishes the quantity sensitive foot structure of NVA which endows coda consonants with moraicity. As far as the intensity values are concerned, the first vowel always shows significantly lower values than the second vowel.

2.4.3.2 Trisyllabic words

The experiment conducted on trisyllabic NVA words reveal a similar pattern as far as phonetic cues to lexical prominence are concerned. In this type of words also, syllable duration is the most robust cue to lexical stress. As it can be seen in Table 2-9, heavy syllables always maintain a significantly greater value compared to light syllables. In a sequence of word initial LL syllables, duration of the first syllable is significantly greater than that of the second syllable. For instance, in (LL)L and (LL)(H) pattern words, the first syllable is longer than the second syllable since it is the head of the trochaic foot (LL): in (LL)L the significance level of the difference between the first and the second syllable is ($p<0.05$, $F[2, 123]=32.06$, $p=0.00$), and in (LL)(H) it is ($p<0.05$, $F[2, 123]=47.59$, $p=0.00$). However, when we compare the second and third syllables of these words, it is found that

in (LL)L the difference is not significant, while in (LL)(H) it is. In case of (LL)L, since the last two syllables do not receive stress, their durational difference is not significant ($p>0.05$, $F[2, 123]=32.06$, $p=0.42$). On the other hand, in words with (LL)(H) pattern, the final syllable is considerably longer than the penultimate syllable ($p<0.05$, $F[2, 123]=47.59$, $p=0.00$).

Table 2-9 One-way ANOVA and Bonferroni post-hoc results comparing the syllables in trisyllabic words with respect to their temporal length (σ = syllable).

		ANOVA					Bonferroni post-hoc			
		Source	SS	df	MS	F	σ1 vs σ2		σ2 vs σ3	
DURATION	LLL	Between groups	14.59	2	7.29	32.06	σ2- σ1	p-value	σ3- σ2	p-value
		Within groups	27.99	123	.23		-.79	0.00	.15	0.42
		Total	42.57	125	.34					
	LLH	Between groups	18.61	2	9.31	47.59	σ2- σ1	p-value	σ3- σ2	p-value
		Within groups	24.06	123	.19		-.84	0.00	.78	0.00
		Total	42.68	125	.34					
	LHL	Between groups	130.09	2	65.05	160.87	σ2- σ1	p-value	σ3- σ2	p-value
		Within groups	49.73	123	.40		2.02	0.00	-2.27	0.00
		Total	179.82	125	1.44					
	LHH	Between groups	9.19	2	4.60	24.33	σ2- σ1	p-value	σ3- σ2	p-value
		Within groups	23.24	123	.19		.53	0.00	-.61	0.00
		Total	32.44	125	.26					
	HLL	Between groups	182.49	2	91.24	418.80	σ2- σ1	p-value	σ3- σ2	p-value
		Within groups	26.80	123	.22		-2.89	0.00	.95	0.00
		Total	209.29	125	1.67					
	HLH	Between groups	163.02	2	81.51	286.15	σ2- σ1	p-value	σ3- σ2	p-value
		Within groups	35.03	123	.28		-2.78	0.00	1.31	0.00
		Total	198.06	125	1.58					
	HHL	Between groups	100.09	2	50.05	240.92	σ2- σ1	p-value	σ3- σ2	p-value
		Within groups	25.55	123	.21		-.93	0.00	-1.24	0.00
		Total	125.64	125	1.01					
	HHH	Between groups	10.56	2	5.28	17.32	σ2- σ1	p-value	σ3- σ2	p-value
		Within groups	18.30	60	.30		-.42	0.05	.10	0.00
		Total	28.86	62						

In Table 2-9, wherever the difference between syllables [(σ2- σ1) or (σ3- σ2)] is negative, the length of the preceding syllable in the syllable sequence (σ1 and σ2

respectively) is greater than the following syllable (σ2 and σ3 respectively). Even in (H)H sequences, the initial syllable constituting a metrical foot are realised longer than the second syllable, which is left unfooted as a measure to avoid stress clash. In (H)HL and (H)H(H) words, the first syllable is significantly longer than the second syllable: ($p<0.05$, $F[2, 123]=240.92$, $p=0.00$) and ($p<0.05$, $F[2, 60]=17.32$, $p=0.05$) respectively. Whereas in (H)H(H) sequence, since the final syllable constitutes a foot, it is manifested significantly longer ($p<0.05$, $F[2, 60]=17.32$, $p=0.00$) than the second syllable, which, though bimoraic syllable, does not form a foot.

Identical to NVA disyllabic words, pitch is not a reliable cue to lexical prominence in NVA trisyllabic words. As already mentioned, the reason behind this may be the discrepancy that exists between phonological association and phonetic alignment of the low pitch accent, which is post-lexically assigned to the most prominent syllable in a phrase. As far as intensity is concerned, it also does not correspond to the prominence pattern in a word.

2.4.4 Summary

In the above reported experiment, it has been explicated that NVA employs syllable duration as a robust cue to lexical prominence. Syllables bearing lexical stress are characterised by greater durational value compared to their unstressed counterparts. This establishes that the variety is a quantity sensitive variety, which assigns morae to coda consonants. Since NVA assigns prominence to heavy syllables, and it frequently creates word initial heavy syllables following various phonological processes (for details see §3.4.1 and §3.4.2), it may be concluded that the variety has a natural proneness for word initial stress. Although diphthongs have not been included in the experiment, our assumption is that they are bimoraic, hence constitute heavy syllables. Pitch and intensity values are not conclusive of lexical prominence pattern in NVA.

2.5 Conclusion

In this chapter, the word level prosody of the two varieties, SCA and NVA has been illustrated from the perspective of the moraic theory of metrical prominence. It is seen that the two varieties of Assamese are quantity sensitive, and maintain a trochaic rhythm. This rhythm is assigned to morae from left to right direction, and the left-most foot in a word is the head foot. Both SCA and NVA are characterised by strict foot binarity: a foot must

contain two morae where left mora is stronger than the right mora. The leftmost syllable in a word is the most prominent syllable, with exception to words where the first syllable is light and the second syllable is heavy. Lexical stress in both the varieties is not assigned to syllables beyond the second syllable. Heavy syllables always attract prominence unless there is prominence clash, since syllable level stress clash is avoided in the two varieties. Though both the varieties demonstrate a default word initial prominence pattern, in NVA this prominence pattern is more forceful which is augmented by such phonological processes as segmental deletion or addition and diphthongisation (§3.4). In the next chapter, the prosodic units above the P-word level will be discussed with regards to SCA and NVA.

Chapter 3 Intonational and Prosodic Structure of Assamese

3.1 Introduction

In the previous chapter on lexical prosody and prominence pattern in SCA and NVA, it has been illustrated how the two varieties demonstrate a preference for word initial prominence. The present chapter discusses the prosodic structure of constituents above the word level, and proposes an intonational model for the two varieties with reference to various sentence types. It also talks about how the lexical prominence pattern interact with larger phrase level prosodic constituents.

As it has already been mentioned, pitch modulation is universally adopted cross-linguistically; some languages (tone and pitch-accent languages) use it at the lexical level, some (intonational languages) at the post-lexical level, while some others at both levels. Since Assamese is neither a tone nor a pitch accent language, its use of pitch modulation is restricted to the post-lexical level. The intonational framework adopted in this work is based on works by Liberman (1975), Bruce (1977), Pierrehumbert (1980), Beckman and Pierrehumbert (1986a), and Pierrehumbert and Beckman (1988). The ToBI transcription system has been used in order to explicitly represent the intonational model proposed in the study. The labels used in the transcription are representative of phonological distinctions rather than being motivated by phonetic realisation (Pitrelli, Beckman, & Hirschberg, 1994; Beckman, Hirschberg, & Shattuck-Hufnagel, 2005). The ToBI system, apart from representing the phonologically contrastive tonal events, reports the hierarchically arranged prosodic structure.

In this dissertation, we have used a modified version of ToBI (Asm_ToBI) transcription system, which represents the intonational and prosodic structure explicitly. The sound files were annotated in 4-tier (four-tier) TextGrid files in PRAAT (Boersma & Weenink, 2015). The first tier is the Tone tier containing information regarding tonal alignment and tone levels, the second tier contains orthographic representation of the sentences recorded. In the third tier, which is the break index tier, clitic, word and phrase level boundaries are demarcated where 0, 1, 2 and 3 refer to clitic, P-word, P-phrase and IP boundary respectively. The lowest tier (miscellaneous) contains information regarding the prosodic phrasing of corresponding IPs and segmental changes accommodated within

P-phrases in them. The F_0 contour used for display in the images has been smoothed in PRAAT at the bandwidth of 10Hz.

As has been explained earlier, intonation is a post-lexical phenomena (Ladd, 2008) which adheres to a hierarchical structure of domains, which are phonological in nature (Ito & Mester, 2012). It has been assumed in this dissertation that Assamese also shows a hierarchically arranged prosodic structure. Here we adopt the Prosodic Hierarchy Theory (henceforth PHT) propagated and developed by Selkirk (1978; 1986; 2009), Nespor and Vogel (1982; 1986) and others. The PHT assumes a prosodic structure, which organizes a finite set of prosodic constituents in hierarchical order. The highest node in the hierarchy is the intonational phrase (henceforth IP), which corresponds mostly to a sentence. The next node below IP is that of the phonological phrase (henceforth P-Phrase). The P-Phrase is motivated by junctural phenomena rather than by the intonation pattern; it is marked by a pitch accent and a boundary tone[7]. The lowest node in the hierarchy adopted by us is that of the prosodic word (henceforth P-word). The idea behind considering P-words as terminal nodes in the hierarchy is motivated by the assumption that intonation involves phrase-level phonological processes[8]. A P-word is not associated with tone assignment (pitch accent and boundary tone). It is P-Phrase which is the minimal unit of tone assignment in Assamese. In contradiction with the PHT, the Direct Reference Theory (henceforth DRT) postulates that phonological rule domains are directly determined by syntactic constituent structure. The basic tenets of the DRT has been formulated in such works as Kaisse (1985), Rizzi and Savoia (1993) and Rotenberg (1978). Odden (1987), as a supporter of the DRT, postulates that "phonological rules…make direct reference to labelled surface syntactic bracketing". Such a hypothesis nullifies the existence of prosodic units admitted by the PHT. This dissertation assumes the PHT, and acknowledges that phonological domains are not related to syntactic structure in isomorphic terms. According to the PHT (Selkirk, 1978; 1980; Nespor & Vogel, 1982; 1986; Inkelas, 1990), phonological processes are accommodated within prosodic domains, which are indirectly

[7] In post-CF environment, SCA P-phrases may lack pitch accent and boundary tone due to deaccentuation effect of CF (see chapter 4).

[8] These three categories, P-word, P-Phrase and IP have been described as *interface* categories by Ito and Mester (2007; 2012), and they show the prosodic pattern of an utterance (Jun, 2005).

determined by syntactic structure (for a detailed comparison of the direct and indirect reference theories see (Elordieta, 2008)).

The present chapter is built as per the following pattern: §3.2 describes the basic notions of P-word, P-phrase and IP in SCA and NVA, §3.3 deals with P-words in the two varieties, §3.4 explicates the various aspects of P-phrases. In §3.5 different types of IPs in SCA and NVA have been studied and compared. Finally, the chapter ends with closing remarks (§3.6) on the topics discussed in the chapter.

3.2 Post-lexical categories

In the present study on SCA and NVA varieties, we assume only two prosodic domains which are tonally marked – phonological phrase (P-Phrase) and intonational phrase (IP). P-Phrases may contain one or more prosodic words (P-words); the minimal constituent requirement for the P-Phrase is a P-word. At the syntactic level, the P-phrase may correspond to a syntactic phrase or a clause. P-Phrases in both varieties normally possess a pitch accent on the first syllable of the phrase and a demarcating boundary tone on the final syllable. These hierarchically arranged prosodic constituents (IP > P-phrase > P-word) always obey the Strict Layer Hypothesis (henceforth SLH) proposed by Selkirk (1984) and Nespor and Vogel (1986). According to SLH, a non-terminal unit in the prosodic hierarchy is composed of one or more units of the immediately lower category. As such, the IP and the P-phrase are composed of P-phrases and P-words respectively.

There have been studies in languages like Japanese (Beckman & Pierrehumbert, 1986a; 1986b), Korean (Jun, 1993) and Bengali (Khan, 2008) which have proposed for a division of the IP into intermediate phases (henceforth ip) and Accentual phrases (henceforth AP): ip demarcates ‘certain phrases and clauses’ whereas AP is the ‘smallest tonally marked phrase’ which ‘roughly corresponds to a single word or small group of words’. The categorisation of the prosodic units in these studies are primarily based on intonational cues.

In the following sections all the prosodic categories will be discussed with reference to SCA and NVA.

3.3 P-word

A P-word in SCA and NVA phonologically maps a syntactic word, it creates a prosodic domain parallel to the syntactic word. As the domains below P-words are not within the scope of the present study, we will consider the P-word to be the lowest node in the hierarchy of the prosodic phrasing. However, we acknowledge, based on the works of Inkelas (1990), McCarthy and Prince (1986/1996) among others that phonological rules also function at the level of *rhythmic categories*[9]: moras (μ), syllables (σ) or feet (F). We assume that a minimal P-word must contain at least one foot, which being always bimoraic, maintains a strong-weak rhythmic profile in SCA (Mahanta, 2001) and in NVA (see previous chapter). As such, each foot maintains a trochaic meter among the morae, retaining the rhythm at the level of morae not at the level of syllables. In the present work, our idea of P-word is limited to that of Hayes (1989b, p. 207) who held that 'a phonological word…is always at least as large as the grammatical word'.

A morpheme qualifies minimally for a P-word if it is prosodically independent and morphologically free (Inkelas, 1990; Fitzpatrick-Cole, 1991). For instance a stem, which is a cyclic domain, constitutes a P-word on its own as it is both morphologically and prosodically free; whereas a root which is morphologically free but prosodically dependent, fails to form a P-word. Similarly affixes and clitics, which are prosodically dependent, do not form P-words independently, they need to be attached to a host in order to form P-words. P-words in SCA and NVA are the end products of word formation rules.

It has already been discussed in the previous chapter that in both SCA and NVA, the stress placement rule is predictable: P-words, being sensitive to weight-to-stress principle, place prominence on heavy syllable, though the default position for stress assignment is the first syllable. Heavy syllables do not attract primary stress beyond the second syllable (see chapter 2).

At the post-lexical level, where the prosodic domains are marked in terms of H and L tones, the domain of the P-word is not marked by tones or prosodic prominence or boundary unless it forms a P-phrase. If two separate P-words form a P-phrase, phrase

[9] The *rhythmic categories* (Ito & Mester, 2012; Jun, 2005) denote the word-internal prosodic units such as foot, syllable and mora. A detailed description of how these categories are distributed in SCA and NVA have been given in chapter 2 of this dissertation.

internally there is no intonational demarcation of the P-word boundary between them; they behave as a single unit at the P-phrase level. As the leftmost foot is the head foot bearing primary prominence, it attracts prominence at the phrase level as well. When a P-word forms a P-phrase, its leftmost foot receives the pitch accent, and out of the two morae, the left mora is more prominent as per the trochaic rhythm. In the sentence given in (1), not all the four constituent P-words are intonationally designated.

1. rɔmɛn ram-ɔr gʰɔr-ɔloi go-isɛ
   Ramen Ram-GEN house-DAT go-PST3
   Ramen went to Ram's house.

The intonational contour of the utterance has been displayed in Figure 3-1, which shows how the first P-word *rɔmɛn* (proper name) is marked by a pitch low on the first syllable and a boundary high on the final syllable. However, the P-words *ram-ɔr* 'Ram-GEN' and *gʰɔr-ɔloi* 'house-DAT' lack boundary peak and pitch trough respectively.

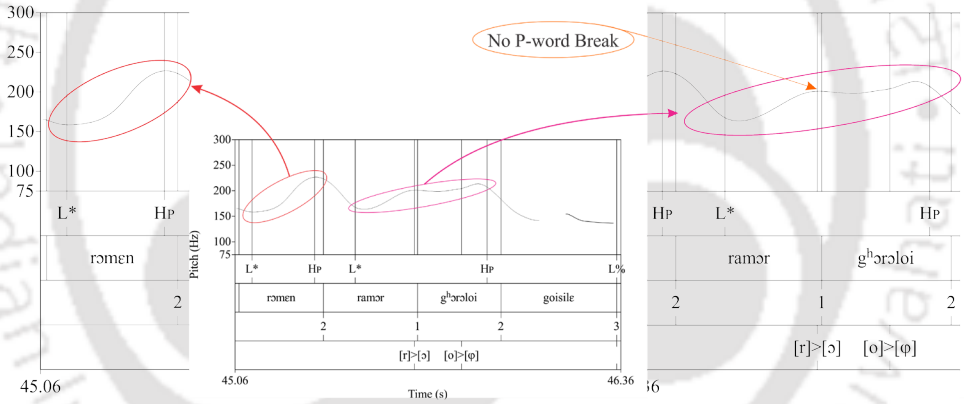


Figure 3-1 Mapping of how P-words are arranged at the post-lexical level. In the left box, the P-word *rɔmɛn* 'Ramen' forms a P-phrase, whereas in the right box two P-words *ram-ɔr* 'Ram-GEN' and *gʰɔr-ɔloi* 'house-DAT' constitute another P-phrase. In the second P-phrase, the pitch contour does not mark the boundary between the two P-words. The prominence pattern of *gʰɔr-ɔloi* at the lexical level also remains unmarked.

The differences among the prosodic realisation of the three P-words are due to the limited role of P-words at the post-lexical level: only when a P-word constitutes a P-phrase independently like *rɔmɛn*, it makes its post-lexical appearance. This implies that P-words do not obligatorily mark their presence at the post-lexical prosodic level, it is rather P-phrases which provide the building blocks of an intonational contour.

Even in NVA, P-words fail to get intonationally specified; for instance in sentence (2), similar to the SCA utterance given in (1), the first word *nɔrɛn-ɛ* (Naren-**NOM**) receives a pitch accent and a boundary tone by virtue of its realisation as a P-phrase. However, when the next two words *dɔrak*^{h} 'tether' and *ain-ba* 'bring-DAT' are combined together to form a P-phrase, their P-word status does not get reflected in the intonational representation.

2. nɔrɛn-ɛ dɔrak^{h} ain-ba ge-isi
   Naren-NOM tether bring-DAT go-PST3
   Naren went to bring a tether.

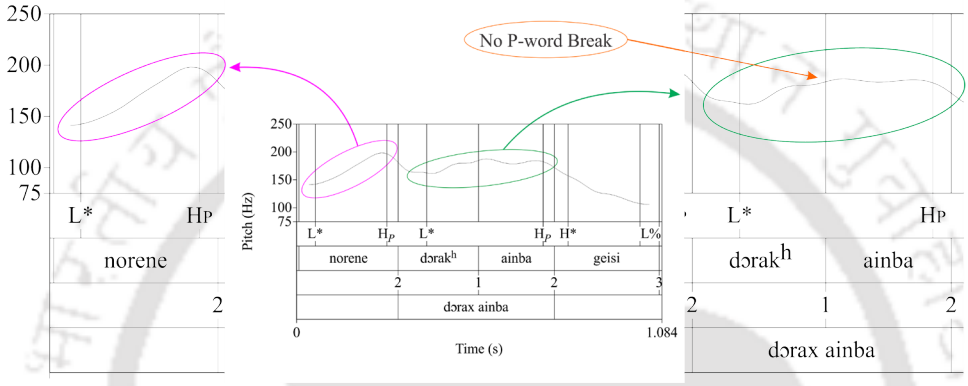


Figure 3-2 The left and the right panels illustrate the zoomed-in pitch contours of two P-phrases: *nɔrɛn* 'Naren' and *dɔrak*^{h} *ain-ba* 'tether bring-DAT'. The two phrases are demarcated by pitch low and high from left to right. In the second P-phrase, the pitch contour does not mark the boundary between the two P-words *dɔrak*^{h} and *ain-ba*. Moreover, the lexical prominence pattern of *ainba* is left unmarked.

Figure 3-2, intonationally representing (2), shows rising contour on the P-word *rɔmɛn-ɛ* which establishes the P-phrase status of the word. The P-word is demarcated at two places: the first and the final syllable. This simultaneous demarcation at two places is absent in the subsequent two P-words: *dɔrak*^{h} manifests the low tone, whereas *ainba* materialises the high tone. This demonstrates how, similar to SCA, NVA intonationally specifies P-words only when they constitute P-phrases. In Figure 3-2, the second pitch rise starts from the first syllable *dɔ* of *dɔrak*^{h} and ends with the final syllable *ba* of *ainba*; the pitch track does not exhibit remarkable movement at the juncture between the two P-words.

In this section, it has been discussed that though P-words are the smallest required unit in the prosodic hierarchy tree, they lack any intonational specification. How P-words are constructed into larger prosodic units will be the concentration of the next section.

3.4 Phonological phrase

The present work assumes P-Phrase as the smallest tonally marked prosodic domain in Assamese. Though each of the pre-verbal P-words or lexical items has the potential to form a P-phrase[10], depending upon factors such as length of a maximally projected lexical category, speaking rate and information structure, the P-phrase formation may vary. P-phrases in Assamese behave similar to P-phrases or APs in Bengali (Hayes & Lahiri, 1991; Khan, 2008; 2014), Hindi (Patil, et al., 2008), Tamil (Keane, The Intonational phonology of Tamil, 2014), etc. Similar to these languages, in Assamese, P-phrases are the minimal units of tonal specification which are characterised by initial pitch accent and final boundary tone. However, we maintain a difference between SCA P-phrases and Bengali or Tamil APs; in SCA, P-phrases constitute phonological domains, and are not always characterised by pitch accents and boundary tones (Hayes and Lahiri's work (1991) also suggests that in Kolkata Bengali, pitch accents are not obligatory for P-phrases). In the following sub-sections (§3.4.1 and §3.4.2), the prominence pattern and the domain of P-phrases in SCA and NVA will be discussed.

3.4.1 P-phrase prominence

In both SCA and NVA, P-Phrases normally contain a pitch accent, though they may contain one or more P-words, and a boundary tone. The pitch accent gets associated with the first syllable, which is by default the lexically prominent syllable[11], and the boundary tone is realised on the nucleus of the final syllable. Normally when post-lexically tone assigned syllables are heavy i.e. with CVV or CVC phoneme sequences, tones align with the right edge of the first mora of such syllables. For instance, whenever P-phrase final syllables have coda consonants, the boundary tone gets aligned with the right edge of

[10] It will be explicated in chapter 4 and 5 how any content word receiving focus can form a phrase at the prosodic level.

[11] However, words which have a second heavy syllable and the first light manifest prominence on the second syllable as SCA and NVA abide by weight-to-stress principle, which consequently sanctions the second syllable (heavy) to form foot (Mahanta, 2001).

vowels, the first of the two morae[12]. Similarly, in P-phrase initial heavy syllables, pitch accents align with the right edge of the first mora. This suggests that these two (initial and final) syllables in an SCA P-phrase (so is the case with NVA) are specified for tonal association; the syllables amidst these two syllables (if any) lack any tonal association. They derive their tonal value as a result of the interpolation of tone between the tonally associated syllables.

Discussed in the section on P-word (§3.3) and in chapter 2, the leftmost syllable is by default the lexically stressed syllable in SCA and NVA. At the level of P-phrase, we assume that the leftmost syllable of the constituent P-word is also the most prominent syllable of the phrase. In cases where P-phrases contain more than one P-words, the first word receives the prominence on its first syllable. The declarative IP given in (3) explicates the post-lexical prominence pattern with the help of a metrical grid. As opposed to the syllable level, where each syllable is assigned a 'x' mark, the P-words and P-Phrases get a single 'x' mark on their most prominent syllable.

x	x			←Post-lexical/ P-phrase level
x	x	x	x	←Lexical/ P-word level
x x	x x	x x x	x xx	←Syllable

3. [[rɔmɛn]$_P$ [ram-ɔr g^{h}ɔr-ɔloi]$_P$ [goisilɛ]$_P$]$_I$
   Ramen Ram-GEN house-DAT go-PST3
   Ramen went to Ram's house.

In (3), out of three P-phrases, *rɔmɛn*, *ramɔr g^{h}ɔrɔloi* and *goisilɛ*, the first and the third P-phrase contain one and the second P-phrase contains two P-words. In the three P-phrases, the first syllable of all the P-words is metrically marked as the most lexically prominent syllable. At the post-lexical level, the leftmost syllable of the first two P-phrases receives 'x' since it is the most prominent syllable in the P-phrases. Since this dissertation assumes the final P-phrase in a declarative IP to lack prosodic prominence in SCA, it is not marked for prominence. The lexically prominent syllable *rɔ* of *rɔmɛn* is realised as metrically prominent syllable at the phrase level since *rɔmɛn* individually forms a P-phrase. In case of *ramɔr g^{h}ɔrɔloi*, on the other hand, the metrical prominence is assigned to the initial

[12] See chapter 2 for detailed analysis of the moraic distribution in SCA and NVA at the lexical level.

syllable *ra* of *ramɔr*. In (3), though each of the P-words are assigned symbol 'x' on its left-most syllable as a marker of lexical prominence, not all of them are assigned post-lexical prominence. For instance, *g^{h}ɔrɔloi* as a part of the larger prosodic domain *ramɔr g^{h}ɔrɔloi*, and *goisilɛ* as declarative IP final constituent are not post-lexically marked for prominence,

The metrical prominence pattern schematised in (3) also gets reflected in the intonational pattern displayed in Figure 3-3.

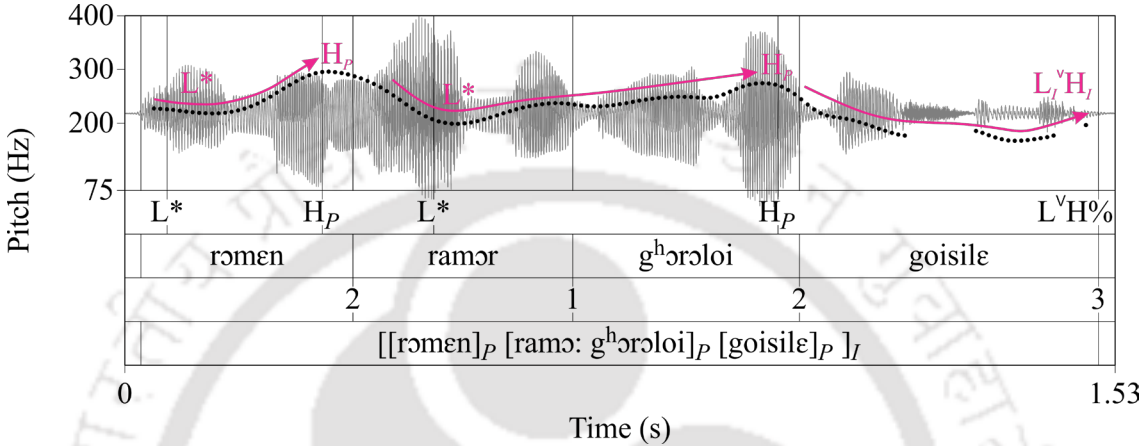


Figure 3-3 The IP *rɔmɛn ramɔr g^{h}ɔrɔloi goisilɛ* 'Ramen went to Ram's house' contains three P-phrases *rɔmɛn*, *ramɔr g^{h}ɔrɔloi* and *goisilɛ*. Leaving the final one, each P-phrase receives a pitch accent (L*) on its first syllable and a boundary tone (H$_P$) on the first mora of the final syllable.

In Figure 3-3, each of the metrically prominent syllable at the P-phrase level is assigned a low pitch accent, which aligns with the only mora of P-phrase initial syllables. In case of *rɔmɛn*, the pitch accent L* aligns with the vowel of the initial syllable *rɔ* which is assigned a mora (see chapter 2 for details). For similar reasons, in the second P-phrase, L* aligns with the nucleus of the first syllable *ra* of *ramɔr*. The P-phrase domains are further characterised by a high demarcative boundary tone H$_P$. In the non-final P-phrases in Figure 3-3, the high boundary tone H$_P$ is associated with the final syllable of each P-phrase. In conformity with our claim regarding moraic alignment of post-lexical tones, H$_P$ aligns with the first mora of phrase final syllables. In *rɔmɛn*, the pitch peak aligns with the vowel (*ɛ*) of the final syllable *mɛn* following which the F$_0$ curve drops. In case of *ramɔr g^{h}ɔrɔloi*, H$_P$ aligns with the first mora of the final syllable *loi* of *g^{h}ɔroloi*; this alignment is reinforced by the pitch drop taking place on /i/, the final mora assigned phoneme of the syllable *loi*. The syllables between the first and the last syllable are tonally underspecified, and they derive their pitch values out of the interpolation between the pitch accent and the boundary tone.

Unlike Bengali (Hayes & Lahiri, 1991), where the final constituent is proposed as the most prominent P-phrase in an IP[13], SCA does not assign post-lexical prominence to the final constituent (normally verb) in WF declarative IPs; this leaves the final constituent bereft of any post-lexical pitch accent. The lack of prominence on the constituent is further indicated by the creakiness in the voice. The word *goisilɛ*, in (3), as IP final constituent fails to constitute a P-phase and hence lacks post-lexical metrical prominence.

Although it has been insisted that the left-most syllable of the first P-word in a P-phrase receives the pitch accent, function words such as pronouns (*mʊr* 'my'/ *amar* 'our') remain tonally unattested if they occupy the said slot. Such words[14] do not bear pitch accents in SCA, showing their prosodic dependency upon and subordinacy to the adjacent lexical constituents. This prosodic dependency of function words on lexical words is not always syntactically motivated. Our data reveal that though function words may be prosodically grouped with its syntactic head, there are trends which show that such prosodically dependent words may form separate P-phrase together with the constituent preceding them.

When a function word is prosodically grouped with the following content word as a P-phrase, the first syllable of the content word, instead of the function word, receives pitch accent. In (4), the first constituent *mʊr* 'my' in the P-phrase *mʊr* g^h*ɔr-ɔloi* 'my house-DAT' is a function word (pronoun), which prosodically lacks tonal specification.

x		x		←Post-lexical/ P-phrase level
x	x	x	x	←Lexical/ P-word level feet
x x	x	x x x	x x x	←Syllable

4. [[rɔmɛn]$_P$ [mʊr g^hɔr-ɔloi]$_P$ go-isilɛ]$_I$
   Ramen my house-DAT go-PST3
   Ramen went to my house.

[13] Though in a later work by Dutta and Hock (2006) established that Bengali too like other SOV languages avoids prominence on utterance final verb.

[14] Similar findings have been discussed in Bengali by Hayes and Lahiri (1991). For them, such words, termed clitic-like words, though form P-phrases together with the lexical word to their right, are not assigned pitch accents.

In Figure 3-4, which represents the metrical grid given in (4), though *mʊr* is the left most syllable in the second P-phrase, it fails to receive the pitch accent; the pitch accent gets associated with the first syllable of *gʰɔrɔloi*.

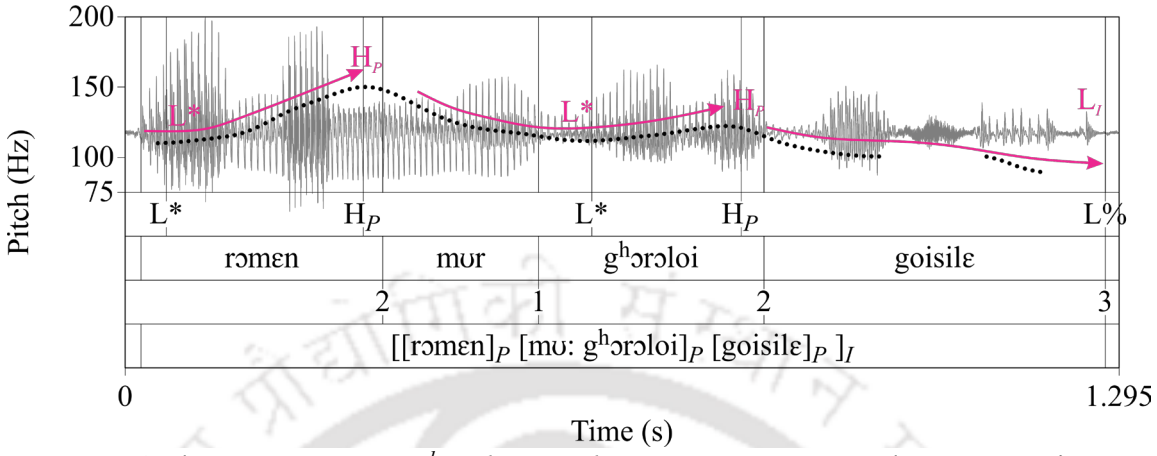


Figure 3-4 The IP *rɔmɛn mʊr gʰɔrɔloi goisilɛ* 'Ramen went to my house' contains two non-final P-phrases *rɔmɛn* and *mʊr gʰɔroloi*. The former receives pitch accent (L*) on its first syllable, whereas in the latter, L* docks on the first syllable of *gʰɔrɔloi*.

The first P-phrase in Figure 3-4 demonstrates a pitch contour identical to the one seen on the first P-phrase in Figure 3-3. The second P-phrase, on the other hand, demonstrates a different contour from that of the second P-phrase in Figure 3-3 with regard to pitch accent alignment. Here the pitch accent L* pitches on the only mora of the first syllable of *gʰɔrɔloi*, instead of *mʊr*. As far as the boundary tones are concerned, they are realised on the final syllable in each P-phrase.

However, there are instances when function words are not prosodically grouped with the right adjacent constituents or syntactic heads, they behaves as prosodic extensions of previous P-phrases i.e. the boundary tone of the preceding P-phrase is realised on the function word. For instance, in (5), overriding the syntax, *amar* constitutes a P-phrase *rɔmɛn amar* together with the P-word preceding it[15].

[15] This shows that in SCA prosodic and syntactic phrasing are not isomorphic. In the post-positional phrase *mʊr gʰɔrɔloi* 'my house-DAT, *mʊr gʰɔr* is a noun phrase (NP), where *mʊr* 'my' as possessive pronoun modifies the head *gʰɔr* 'house'. Prosodic parsing of *rɔmɛn mʊr* in (5) is syntactically ungrammatical.

x x ←Post-lexical/ P-phrase level

x x x x ←Lexical/ P-word level feet

x x x x x x x x x ←Syllable

5. [[rɔmɛn amar]$_P$ [g^{h}ɔr-ɔloi]$_P$ [go-isil-ɛ]$_P$]$_I$

Ramen our house- DAT go-PST-3

Ramen went to our house.

In Figure 3-5, the intonational realisation of (5) has been instantiated which demonstrates how the possessive pronoun *amar* 'our' prosodically contributes to the P-phrase preceding it.

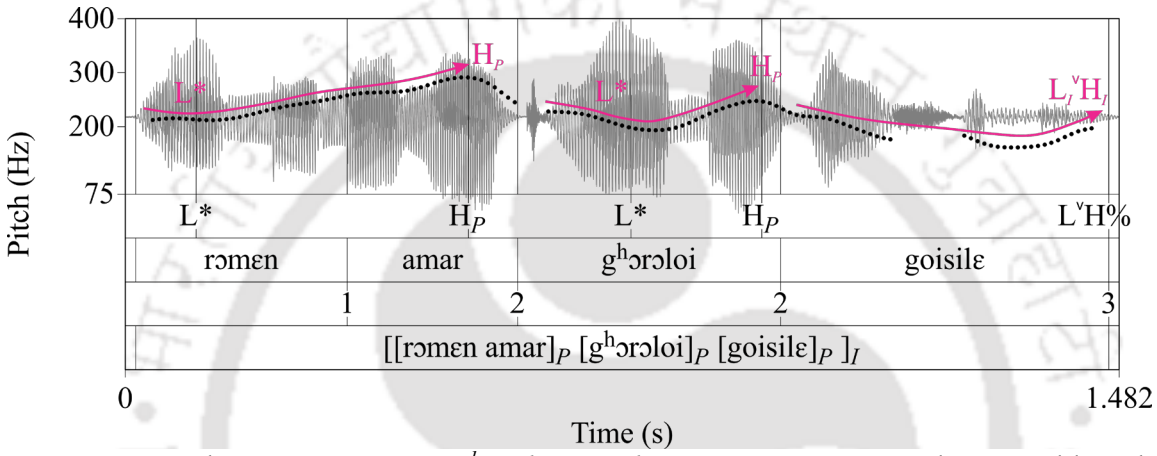


Figure 3-5 In the IP *rɔmɛn amar g^{h}ɔrɔloi goisilɛ* 'Ramen went to our house', although syntactically *amar* is a pre-modifier of *g^{h}ɔrɔloi*, at the prosodic level, it constitutes P-phrase together with *rɔmɛn*. The boundary tone H$_P$ of the first P-phrase is manifested on the first mora of the final syllable of *amar*.

Figure 3-5 displays how the prosodic domain of *rɔmɛn amar*, as demonstrated in (5), is also supported at the intonational level. While the pitch accent L* associates with the first syllable of *rɔmɛn*, the boundary tone H$_P$ aligns with the first mora of the final syllable of *amar*.

Hence we see that in SCA, the first syllables of P-phrases are assigned metrical prominence within the phrases irrespective of the quantity of constituent P-words; however, prosodically dependent function words fail to receive prosodic prominence at the post-lexical level.

As far as NVA P-phrases are concerned, they maintain a prominence pattern similar to those in SCA in that the first syllable receives post-lexically assigned metrical prominence. It is interesting to see that, in spite of having segmental differences at P-word

level, SCA and NVA share similar prominence pattern at P-phrase level. The IP given in (6) explicates the P-phrase internal prominence pattern.

x	x	x	x	←Post-lexical/ P-phrase level
x	x	x	x	←Lexical/ P-word level
x x x	x x	x x	x x	←Syllable

6. [[rɔmɛn-ɛ]$_P$ [ram-ɔr]$_P$ [g^{h}ɔr-ɔk]$_P$ [ge-isil]$_P$]$_I$
   Ramen-**NOM** Ram-GEN house-DAT go-PST3
   Ramen went to Ram's house.

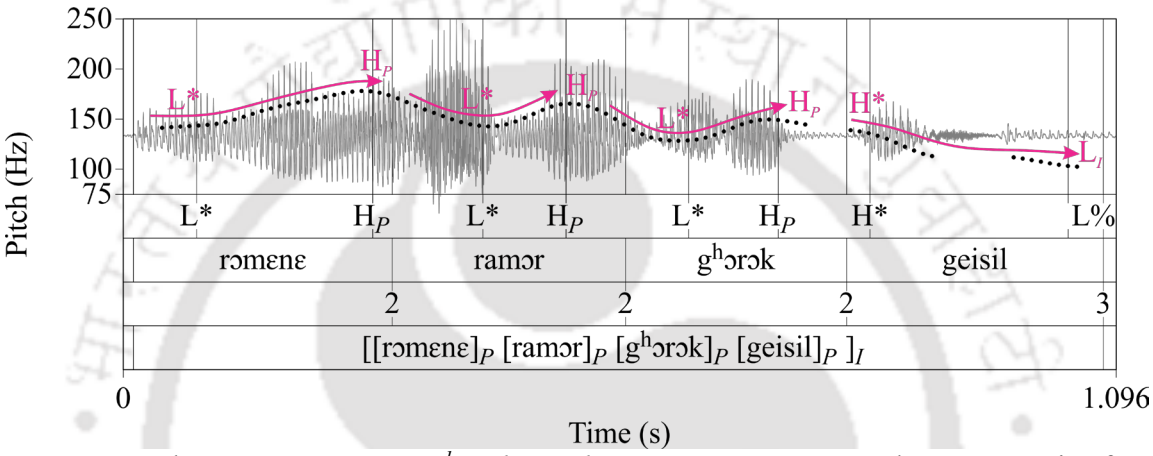


Figure 3-6 The IP *rɔmɛnɛ ramɔr g^{h}ɔrɔk geisil* 'Ramen went to Ram's house' contains four P-phrases *rɔmɛnɛ, ram-ɔr*, *g^{h}ɔrɔk* and *geisil*. Each P-phrase receives a pitch accent (L*/ H*) on its first syllable and a boundary tone H$_P$/ L$_I$ on the nucleus of its final syllable.

In sentence (6), we have four P-phrases: *rɔmɛnɛ*, *ramɔr*, *g^{h}ɔrɔk* and *geisil*, each one lays metrical prominence on its first syllable. As demonstrated in Figure 3-6, each of the words bears both pitch accent (L*/ H*) and boundary tone (H$_P$/ L$_P$) on its first and final syllable respectively since each word constitutes an independent P-phrase.

In the first P-phrase *rɔmɛnɛ*, the pitch accent L* aligns with the nucleus of the first syllable *rɔ*, and the boundary tone H$_P$ phonetically aligns with the only mora of the final syllable *nɛ* i.e. the vowel /ɛ/. In the second and third P-phrase again, the pitch accent L* aligns with the initial syllable mora; at the boundary of both the phrases, however, different pitch contours can be seen. In the second phrase, the H$_P$ aligns with the first mora of the final syllable *mɔr* of *ramɔr*, following which F$_0$ contour drops smoothly to meet the next low (L*) tonal target realised on the first syllable of the succeeding P-phrase *g^{h}ɔrɔk*. In the third P-phrase *g^{h}ɔrɔk*, a plateau is observable after H$_P$ is manifested on the first mora of the final syllable *rɔk*. 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 H_P of *g^{h}ɔrɔk* to H* of *geisil* creates a plateau.

Further, compared to SCA, NVA maintains a difference in its treatment of function words. We have seen how SCA adopts two different prosodic strategies to avoid prominence assignment to function words: 1) most of the time such words are prosodically grouped with the word preceding them in a single P-phrase (overriding syntactic phrasing), and 2) if such a word occurs as the leftmost word in a P-phrase, the pitch accent falls on the first syllable of its right adjacent lexical word. On the contrary, in NVA such words are not always treated as prosodically marginalised (as it is in SCA); they are on no occasion included in the P-phrase preceding it and are capable of constituting independent P-phrases. As such, NVA does not prosodically differentiate (7) from (6) as far as tonal assignment in the second P-phrase is concerned.

x	x	x	x	←Post-lexical/ P-phrase level
x	x	x	x	←Lexical/ P-word level
x x x	x x	x x	x x	←Syllable

7. [[rɔmɛn-ɛ]$_P$ [amar]$_P$ [g^{h}ɔr-ɔk]$_P$ [ge-isil]$_P$]$_I$
   Ramen-NOM our house-DAT go-PST3
   Ramen went to Ram's house.

In (7), each P-word constitutes an individual P-phrase, and is initially assigned 'x' mark both at lexical and P-phrase level. The intonational contour of (7) has been displayed in Figure 3-7.

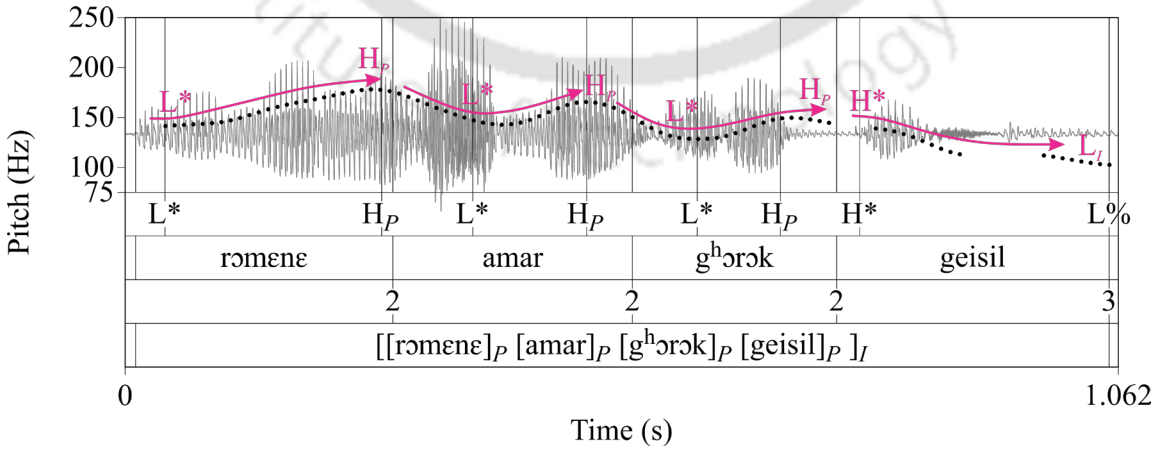


Figure 3-7 The IP *rɔmɛnɛ amar g^{h}ɔrɔk geisil* (Ramen went to our house) contains four P-phrases *rɔmɛnɛ*, *amar*, *g^{h}ɔrɔk* and *geisil*. Each P-phrase receives pitch accent (L*/ H*) on its first syllable and boundary tone (H_P/ L_I) on the nucleus of its final syllable.

In Figure 3-7, the possessive pronoun *amar* forms an independent P-phrase which is characterised by a pitch accent and a boundary tone. This kind of P-phrase formation out of possessive pronouns has not been reported in SCA in the present study[16]. The annotated intonational contour of sentence (7), demonstrated in Figure 3-7, shows how each P-phrase is assigned a pitch accent (L*/ H*) on its first syllable in accordance with the metrical prominence pattern given in (7).

Thus in SCA and NVA, the left-most syllable in a P-phrase is the default location for pitch accent assignment. Though SCA makes some provisions to avoid assigning pitch accent to function words, NVA often maintains a uniform strategy to mark P-phrase initial syllable as the most prominent syllable. In the next section we discuss the domain of P-phrase, and its characteristic features with reference to both the varieties.

3.4.2 P-phrase domain

This dissertation further assumes that P-phrases constitute separate phonological domains, which are often characterised by intonational demarcation and phrase internal segmental processes. So far we have seen how the P-phrase domain is often assigned a pitch accent and a boundary tone. The pitch accent (T*) is realised on the most prominent syllable of a P-phrase which is by default the leftmost syllable (with an exception to P-phrases starting with prosodically dependent function words). Similarly, the right edge of a P-phrase is delimited by a boundary tone (T_P). Non-final P-phrases in both SCA and NVA IPs are characterised by low pitch accent (L*) and high boundary tone (H_P), which lend an LH melody to the P-phrases. Apart from the intonational cues, the P-phrase as a prosodic domain is also testified by various segmental processes, which are accommodated domain internally. Segmental processes such as /r/ deletion and intervocalic spirantisation of aspirated plosives are accommodated within P-phrase domains across P-word boundaries. These processes are otherwise blocked beyond prosodic boundaries. In SCA, word internally /r/ "is subject to optional deletion giving way to phonetic lengthening in the place of the deleted segment" (Mahanta, 2012). In (8a) few words have been listed, for example, where word internal /r/ gets deleted, whereas word finally (8b) it is retained.

[16] In (4) and (5), we see how in SCA a possessive pronoun is either included in the preceding P-phrase, or lacks pitch accent.

8. a. dʰɔrmɔ → dʰɔ:mɔ ‘religion’
   dɔrza → dɔ:za ‘door’
   xɔmpurnɔ → xɔmpu:nɔ ‘complete’
   b. daŋɔr → daŋɔr ‘big’
   xar → xar ‘manure’
   nibir → nibir ‘intimate’

This kind of assimilation is not always limited within the lexical domain; when a P-word from (8b) forms P-phrase with another word, the final /r/ undergoes deletion leaving a compensatory lengthening in the preceding vowel. For instance, in (9), the word final /r/ of *daŋɔr* undergoes deletion and is compensated by a longer preceding vowel /ɔ/.

	L*H$_P$	L*	H$_P$	L$_I$
9.	[[rɔmɛn]$_P$	[daŋɔr [ɔ]	manuh]$_P$	[ho-l]$_P$]$_I$
	Ramen	big	man	happen-PST3[17]
	Ramen became a great man.			

Since utterance (9) is uttered in WF context, each non-final P-phrase is designated by L*H$_P$ pitch specification. In the second P-phrase *daŋɔr manuh* ‘great man’, the word final /r/ undergoes optional deletion going against the prediction made in (8b). Though at the lexical level /r/ occupies final position, at the P-phrase level it occurs phrase medially; this prepares the environment for /r/ deletion within the P-phrase.

In SCA, there is another word internal segmental process called intervocalic lenition of aspirated plosives[18]. When placed between two vowels, an SCA aspirated plosive is optionally pronounced as its fricative counterpart. In (10a) two such words are presented where spirantisation takes place word internally due to intervocalic surrounding, whereas word initially they are produced as aspirated plosives (10b).

10. a. xɔgʰɔn → xɔɣɔn ‘frequent’
    xopʰura → xoɸura ‘small box’

[17] The glossing of the examples has been done according to the Leipzig convention format (2016).

[18] In Assamese, aspirated plosives such as [pʰ, bʰ, tʰ, dʰ, kʰ, gʰ], which are otherwise pronounced as fortis, undergo lenition in intervocalic environment (Goswami G. C., 1982). Further, spirantisation of the voiceless aspirate /kʰ/ into [x] and [χ] has been reported by Mahanta (2012).

b, pʰotik → pʰotik ‘a mineral’
gʰɔtɔna → gʰɔtɔna ‘incident’

Identical to /r/ deletion, intervocalic stop spirantisation is regularly observed within P-phrases even when stops occur in word initial position.

	L* H$_P$	L*	H$_P$	L* H$_P$	L$_I$
11.	[ram-ɛ]$_P$	[gɛruwa	pʰul]$_P$	[xopʰura-t]$_P$	bʰɔr-alɛ]$_I$
			[ɸ]	[ɸ]	
	Ram-NOM	saffron	flower	small box-LOC	insert-PST3

Ram inserted a saffron flower in a small box.

In (11), *geruwa pʰul* constitutes a P-phrase placing P-word initial [pʰ] of *pʰul* in phrase medial position and intervocalic environment where [pʰ] spirantises to [ɸ] as per the process of intervocalic aspirate lenition. Interestingly, when *pʰul* receives CF, [pʰ] no longer undergoes spirantisation; the process is blocked by the existence of a phrase level prosodic boundary between *geruwa* and *pʰul*.

As far as the determinant factors of a P-phrase domain are concerned, NVA is identical to SCA since it employs both intonational and segmental cues to mark the prosodic domain. It has already been demonstrated in the preceding section (§3.4.1) that NVA P-phrases are designated by an initial pitch accent and a final boundary tone. For instance, in IP (6), we could see how each constituent P-phrase receives a pitch accent (L*/ H*) and a boundary tone (H$_P$/ L$_I$) (Figure 3-6).

Identical to SCA, in NVA P-phrases are not only characterised by post-lexical tonal specifications, they also serve as prosodic domains, which accommodate various segmental processes such as /r/ assimilation, aspirate spirantisation, etc.

In NVA, when /r/ is followed by a coronal consonant P-word internally, it may assimilate into the following consonant and form a geminate. In (12), few words are listed as examples where /r/ transforms into the following coronal consonant (/d/, /z/ and /s/) and gives rise to geminates (/dd/, /zz/ and /ss/ respectively).

12. /dɔrdam/ → /dɔ**d**dam/ ‘bargain’
/dɔrza/ → /dɔ**z**za/ ‘door’
/kɔr-si/ → /kɔ**s**-si/ ‘do-PST3’

This assimilation is also seen across P-words when they are members of a P-phrase. Here, IP (13) can be considered as an example.

13. [[rɔmɛn-ɛ]$_P$ [ram-ɔr [s] soil-tu-r]$_P$ [nam-tu]$_P$ [zan-ɛ]$_P$]$_I$

Ramen-NOM Ram-GEN boy-DET-GEN name-CLS know-PRS3

Ramen knows the name of Ram's son

In (13), the second P-phrase *ramɔr soiltur*, there are two P-words *ramɔr* and *soiltur*. Although /r/ occurs word finally in *ramɔr*, it undergoes assimilation with the following coronal consonant /s/; this testifies that *ramɔr* and *soiltur* together constitute a phonological domain.

P-phrase as a phonological domain is also established by aspirate spirantisation across lexical prosodic boundaries which otherwise occur in word internal intervocalic environment. In NVA, similar to SCA, word internally aspirated stops are produced as their fricative counterparts if they occur in an intervocalic atmosphere. In (14), the exemplified words show how /g^h/ and /k^h/ are produced as /ɣ/ and /x/ when placed between two vowels within a P-word.

14. /ag^{h}ɔn/ → / aɣɔn / 'a month'
/mak^{h}ɔn/ → / maxɔn / 'butter'

This intervocalic spirantisation can also take place across P-word boundaries, if they are members of a single P-phrase. Word initial occurrences of aspirates are seen produced as fricatives when they get an intervocalic environment across P-word boundaries within a P-phrase domain. In IP (15), it has been demonstrated how spirantisation occurs P-phrase internally.

L* H$_P$ L* H$_P$ L* H$_P$ H* L$_I$

15. [[rɔmɛn-ɛ]$_P$ [mak^{h}ɔn-ɔr [x] [φ] g^{h}ɔr-ɔt]$_P$ [g^ɣ] [kɔmla k^{h}a-ba]$_P$ [x] [ge-isi]$_P$]$_I$

Ramen-NOM Makhan-GEN house-DAT orange eat-PER go-PST3

The second and the third P-phrases in (15) show how word initial [g^h] and [k^h] undergo sprirantisation to [g^ɣ] and [x] respectively. Though they are not preceded by another vowel sound word internally, they are provided with a vowel by the preceding words within the P-phrase domain.

3.4.3 Summary

Thus the discussion in the previous sections reveals that P-phrases in SCA and NVA, apart from being intonationally characterised by pitch accents and boundary tones, serve as prosodic domains that accommodate segmental rules phrase internally. The P-phrase is the minimal unit with tonal specifications in both the varieties. Pitch accents align with left-most syllables and boundary tones are realised on final syllables in P-phrases. Normally the aligning point for tones in syllables is the right edge of either the first mora in case of heavy syllables or the only mora in case of light syllables. Although there are instances of delayed realisation of low pitch accents, they are not contrastive phonologically. A constituent minimally requires to be a P-word in order to constitute a P-phrase. In the next section, the highest node in the hierarchy i.e. IP has been discussed with reference to various sentence types in SCA and NVA respectively.

3.5 Intonational phrase (IP)

In the prosodic hierarchy tree the IP occupies the top-most node, and it is 'a concatenation of one or more P-phrases' (Hayes, 1989b). Normally in Assamese, an IP phonologically represents a prosodic phrase which corresponds to 'a clause in syntactic constituent structure'[19]. Identical to IPs in other South Asian languages (henceforth SALs), SCA and NVA IPs are characterised by repeated LH melody on the non-final P-phrases. It is further marked by a subsequent pause and an IP final boundary tone: low L% or high H% or falling HL% or rising LH%[20]. Non-final rising contours are optional because IPs minimally contain a single P-phrase, in which case the question of non-final rising contours does not arise. Such rises correspond to P-phrases designated by L*H_P pitch contour; normally all sentence types follow a similar pattern as far as intonationally designating these non-final P-phrases are concerned. It is in case of the final constituent that variations are found among IPs representing different sentence types.

In the following sections, we elaborately discuss different sentence types in the two varieties of Assamese investigated in this dissertation, SCA and NVA with regard to how

[19] Here we may recall Selkirk's (2009) Match theory which advocates for a matching up of 'constituents of syntactic structure and constituents of prosodic structure'.

[20] In order to denote IP boundary tone both T% and T_I are used interchangeably in the dissertation.

different tonal events get associated to different points in IPs. Since the IPs in both the varieties maintain different pitch configurations for non-final and final constituents, each section explaining the tonal patterns of an individual variety is further divided into two sections illustrating the intonational realisation of non-final and final constituents respectively.

3.5.1 SCA IPs

In this section, which is divided into two sections: §3.5.1.1 and §3.5.1.2 intonational phonology of SCA IPs has been illustrated with reference to non-final and final constituents respectively. Since, compared to non-final P-phrases, final P-phrases demonstrate rich tonal variation, they have been discussed earlier than the non-final P-phrases.

3.5.1.1 SCA IP final P-phrases

3.5.1.1.1 In declarative IPs

In most SALs, the final constituent in declarative IPs is not marked for post-lexical prominence (Dutta & Hock, 2006) (cf. Hayes & Lahiri (1991) and Khan (2014)). Following a similar trend, SCA declarative IPs[21] lack pitch accent on the final constituent (normally verb). As per the assumption of the present work, though the final constituent forms a P-phrase, it lacks phonological prominence on its initial syllable.

In SCA, due to lack of prominence on the final constituent, the penultimate constituent exhibits the last major pitch movement. This constituents is designated by L*H$_P$ pitch pattern: L* and H$_P$ are realised on the first and the last syllable of the constituent respectively. Following the constituent, pitch drops smoothly under the influence of the IP final low boundary tone L$_I$. For instance, in sentence (16) we can see that the immediately pre-verbal P-phrase *milɔnɔk* is specified for L*H$_P$ pitch pattern.

				L* H$_P$	L$_I$
16.	[[rɔmɛn-ɛ]$_P$	[dɔrza-r	sabi-pat]$_P$	[milɔn-ɔk]$_P$	di-lɛ]$_I$
	Ramen-NOM	door-GEN	key-CLS	Milan-ACC	give-PST3
	Ramen gave the door-key to Milan				

[21] By declarative IPs here we refer to those IPs which prosodically represent sentences uttered in wide or broad focus (WF) condition i.e. the entire sentence is in focus.

The intonational manifestation of the tonal specification given in IP (16) has been displayed in Figure 3-8.

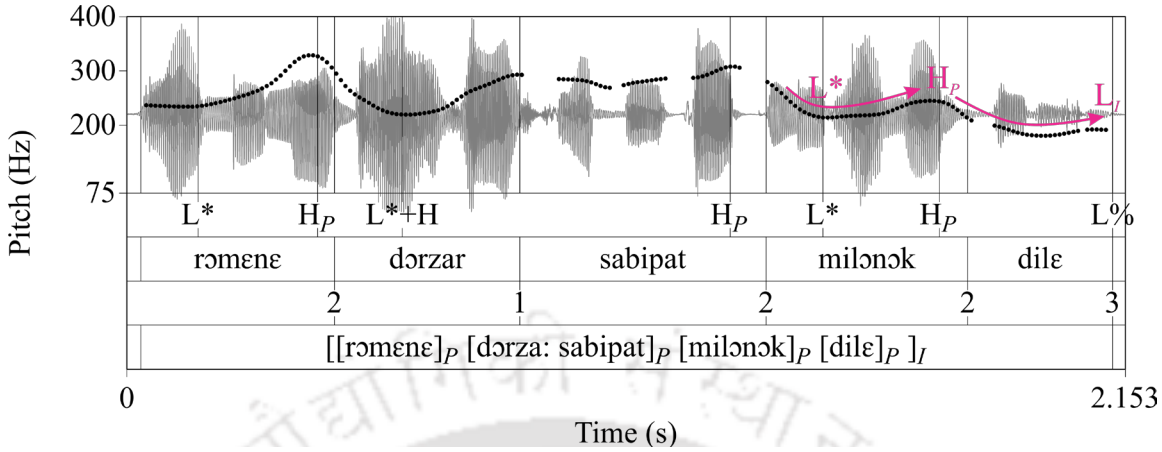


Figure 3-8 In the utterance *rɔmɛnɛ dɔrzar sabipat milɔnɔk dilɛ* 'Ramen gave the door-key to Milan' the IP final major pitch movement (L*H$_P$) occurs on the indirect object *milɔnɔk*.

In (16), as displayed in Figure 3-8, the indirect object *milɔnɔk* bears the final major pitch movement after which the pitch contour drops smoothly since the IP boundary specified for a low boundary tone (L$_I$). This constituent bears the last pitch accent (L*) of the IP on its first syllable *mi* and is delimited by P-phrase high boundary tone H$_P$ on its final syllable *nɔk*. Thus we see that in SCA declarative IPs, the final P-phrase lacks prosodic prominence.

Further, when an all new sentence with a complex predicate is uttered, the IP final pitch accent falls on the initial component of the predicate. For instance in (17), it can be seen that the complex predicate *gusi gol* does not form a composite unit at the prosodic level; on the contrary the unit is split into two prosodic components, *gusi* and *gol*. Both constituents form individual P-phrases.

				L*H$_P$	L$_I$
17.	[[rɔmɛn-ɔr]$_P$	[gab^{h}ɔru]$_P$	[b^{h}ɔnijɛk-zɔni]$_P$	[gus-i]$_P$	[go-l]$_P$]$_I$
	Ramen-GEN	young	sister-DET	move-PRF	go-PST3

Ramen's younger sister went away.

In Figure 3-9, it has been demonstrated how *gusi* is characterised by L* pitch accent on its first syllable and H$_P$ boundary tone on the last syllable. Following *gusi* the F$_0$ contour drops smoothly until IP boundary where it undergoes an optional pitch rise due to L^{v}H% boundary tone.

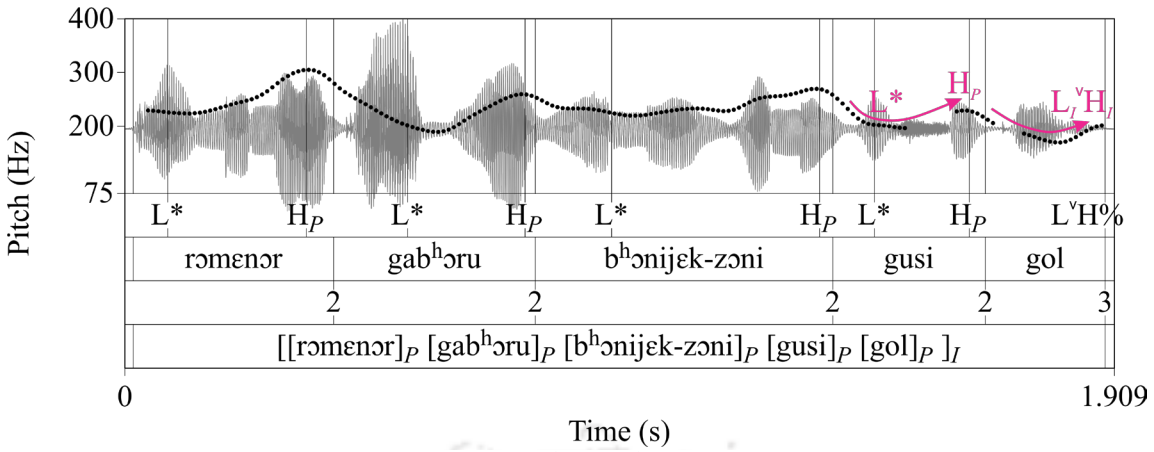


Figure 3-9 In the utterance *rɔmɛnɔr gab^{h}ɔru b^{h}ɔnijɛk-zɔni gusi gol* 'Ramen's younger sister went away' the IP final major pitch movement (L*H$_P$) is seen on the first component *gusi* of the complex predicate *gusi gol*.

Although the penultimate constituent in declarative IPs has been argued here as the default position for final pitch accent placement, we will see in chapter 4 that this is subject to the focus status of the IP. A focused constituent in SCA bears IP final accent irrespective of its position in the IP. As such, the focused element constitutes an independent P-phrase.

Furthermore, SCA declarative IPs are characterised by either L% or L$^{\text{ᵛ}}$H% boundary tone, which compels the F$_0$ contour to undergo a smooth fall (L%) following the IP final pitch rise, or a modest rise after a fall in the latter case (L$^{\text{ᵛ}}$H%)[22]. In the present data, both types of boundary tone are found in free variation. Ohala, in his proposal for Frequency code (1996), suggested that cross-linguistically high or rising tone is associated with politeness, submission, friendliness, non-threat etc. (Gussenhoven, 2004). In the same vein, we assume that the optional rise at the IP boundary is a politeness marker adopted by SCA speakers.

3.5.1.1.2 In incomplete declarative IPs

Languages obey the Production code (Gussenhoven, 2002; 2004), which associates high beginnings with new topics, and low beginnings with continuation of topics. In relation to

[22] The diacritic 'ᵛ' has been used before the H tone here in order to indicate the marginalised nature of pitch rise which L$^{\text{ᵛ}}$H% tone initiates at IP boundary. L$^{\text{ᵛ}}$H% can always replace L%. Although we assume that L$^{\text{ᵛ}}$H% lends a tinge of politeness to an utterance, perception tests will be required to validate the claim. It is in contrast to incomplete declarative IP boundary tone LH%, which incorporates a radical pitch rise at IP boundary.

utterance ends, the code concludes that 'high endings signal continuation, low endings finality and end of turn' (Gussenhoven, 2002, p. 51). For instance, Dutch (Geluykens & Swerts, 1994) employs H_I, and Bengali (Hayes & Lahiri, 1991) and Stockholm Swedish (Bruce, 1990) use H_IL_I boundary tones to signal continuation. Similarly, continuation of an utterance in SCA is conveyed with an IP final rising boundary tone L_IH_I. Just as the P-phrases in declarative IP final position are assumed to lack post-lexical prominence, they are proposed to lack prominence in incomplete declarative IPs as well. Both utterance types exhibit a rising pitch contour on the penultimate constituent with L^*H_P tonal specification. It is only in case of the boundary tone that the two types of IPs demonstrate a significant difference: as opposed to the falling contour (with optional modest rise at the end) of complete declaratives, incomplete declaratives undergo a drastic rise at the IP boundary. In the IP given in (24), the first component *kandiboloi* of the complex predicate *kandiboloi* d^h*orilɛ* is designated by L^*H_P pitch pattern.

			L*	H_P	L_I
18.	[[rɔmɛn-ɛ]$_P$	[zetija]$_P$	[kand-ibo-loi]$_P$		d^hor-il-ɛ]$_I$
	Ramen-NOM	when	cry-FUT-DET		hold-PST-3
	When Ramen started to cry				

The annotated intonational contour of IP (18) has been given below which demonstrates how the tonal specification given in the IP are manifested.

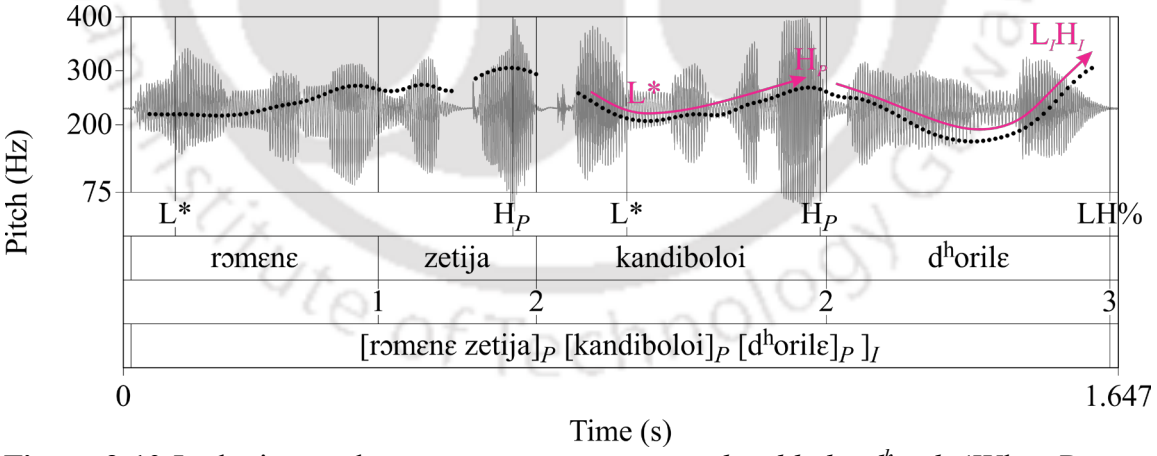


Figure 3-10 In the incomplete utterance *rɔmɛnɛ zetija kandiboloi* d^h*orilɛ* 'When Ramen started to cry' the IP final constituent d^h*orilɛ* does not get post-lexical prominence. Its immediately preceding constituent *kandiboloi* is designated by L^*H_P pitch specification. The IP final boundary tone LH% causes a drastic pitch rise on the final syllable of the IP.

As we can see in Figure 3-10, the penultimate constituent *kandiboloi* exhibits the final major pitch movement of the IP, and is characterised by L^*H_P pitch pattern. Following the

pitch rise on the constituent, the F_0 track undergoes a fall-rise on the final constituent *d^{h}orilɛ* since it right aligns with the IP boundary and manifests the IP final boundary tone LH%, which concludes SCA incomplete declarative utterances. The H tone of the LH% sequence normally touches the highest point in the speaker's pitch range in the IP.

When the pitch contours of the utterances given in (16) and (17) are compared with that of (18), it is seen how complete and incomplete declarative IPs differ from each other only in respect of IP boundary tone. There is no difference between the final pitch accent assignments in the two types of utterances: it can be predicted on the penultimate constituent of IPs. This constituent constitutes the IP final P-phrase with L*H$_P$ contour. Although there are evidences of final pitch rise in complete declarative IPs that end with L^{v}H% boundary tone, the rise is marginal compared to the rise initiated by continuation boundary tone LH%.

3.5.1.1.3 In yes/ no question IPs

In yes/ no questions, unlike declarative questions, the option to answer 'yes' or 'no' is available to the addressee (Truckenbrodt, 2009). In SCA, yes/ no questions are formed out of declarative sentences by placing the particle *nɛ* at the end of the latter. The particle *nɛ* is morphologically free (Barbora, 2002, p. 101) but prosodically dependent. The particle *nɛ* always requires a finite verb as its host on which it is prosodically dependent. Sometimes in yes/no questions, *nɛ* is accompanied by the question word *ki* 'what', which lends politeness to the enquiry (Barbora, 2002, p. 138). Though Barbora has considered *nɛ* as a question particle in both contexts, the present dissertation proposes two different prosodic representations of *nɛ* in the two contexts. When *nɛ* is not followed by the question word *ki*, it behaves as a question clitic (henceforth QC), and in a context where *nɛ* co-occurs with *ki*, the combination prosodically behaves as a question particle *neki* (henceforth QP)[23]. At the level of orthography also, *nɛ* is written together with its host as single grammatical word, however *neki* is written separately from the preceding finite verb.

[23] =*nɛ* and neki as QC and QP respectively has also been proposed by Sarma (2013, p. 235).

In its right, as a QC *=nɛ* shares similarities with SCA morphological focus markers[24] , which attract prosodic prominence at the post-lexical level. In contrast to MFMs, which can adjoin any category of words, *=nɛ* can only be hosted by finite verbs. Since MFMs are marked by post-lexical prosodic prominence, we propose that *=nɛ* also is characterised by H* pitch accent[25]. When *=nɛ* is attached to a verb, it provides a yes/no choice to the listener vis-à-vis the action of the verb. For instance, in (19), *=nɛ* is hosted by the finite verb *loba* 'take' which asks the listener to give his/her consent about taking or not taking something. Thus *loba* gets informational importance (focus) in the IP.

L H* H_I

19. [[ram-ɔr pɔra kiba]$_P$ [lɔ-ba=nɛ]$_P$]$_I$

Ram-GEN from something take-PRS2=QC

Will you take something from Ram?

The intonational manifestation of (19) has been demonstrated in Figure 3-11 with annotated TextGrid.

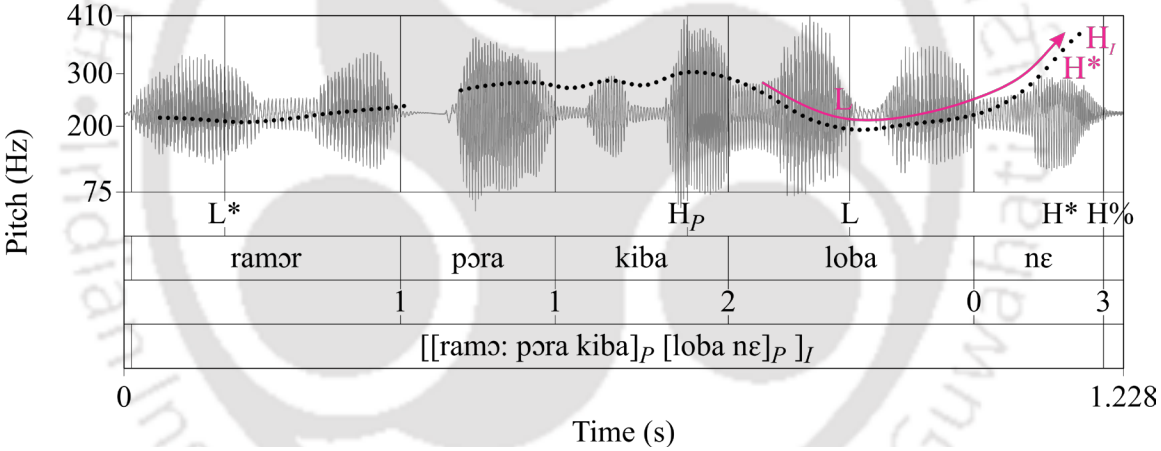


Figure 3-11 The yes/no question *ramɔr pɔra kiba loba=nɛ* 'Will you take something from Ram?' shows how the final constituent *loba=nɛ* constitutes a P-phrase and bears the IP final pitch accent H* preceded by L tone.

In (19), the IP final accent H* falls on the final syllable of *loba=nɛ* and is preceded by another L tone, realised on the first syllable of the constituent. Further, we assume that

[24] Morphological focus markers (MFMs) have been elaborately discussed in chapter 5, which exhibits how MFMs represent the prosodic prominence of their host by bearing the focus representative pitch accent of the constituent.

[25] Assigning a starred tone to *=nɛ* is also motivated by its prosodic behaviour in alternative questions.

yes/no question IPs with *=nɛ* QC are demarcated by high boundary tone H_I. Due to the presence of two high tones (H* and H_I), an exceptional pitch rise on the final syllable of the IP is perceptible.

The next type of yes/no question is asked by attaching QP *neki* IP finally. The use of the question word *ki* after *nɛ* is optional with positive yes/no questions, whereas it is obligatory with negative yes/no questions (Barbora, 2002). In contrast to the QC *=nɛ*, the QP *neki* lacks prosodic prominence and behaves akin to the final constituent in SCA declarative IPs. In questions asked with *neki*, the immediately preceding finite verb forms a P-phrase designated by L*H_P tonal pattern. The F_0 contour drops smoothly through *neki* until IP boundary. For instance, in the yes/no question (20), the finite verb *loba* is assigned L*H_P tonal pattern since it forms a P-phrase. The following QP *neki* lacks any tonal specification though it constitutes a P-phrase.

			L* H_P		L_I
20.	[[ram-ɔr	pɔra	kiba]$_P$	[lo-ba]$_P$	[neki]$_P$]$_I$
	Ram-GEN	from	something	take-PRS2	QP
	Will you take something from Ram?				

The annotated pitch contour of IP (20) given in Figure 3-12 demonstrates the intonational manifestation of the tonal specifications.

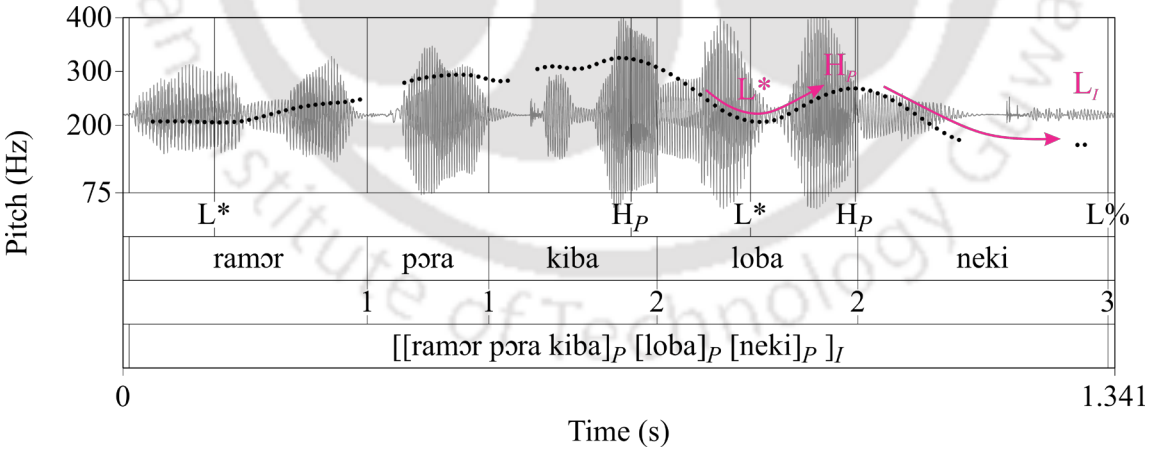


Figure 3-12 The yes/no question *ramɔr pɔra kiba loba neki* 'Will you take something from Ram?' shows how *loba* and *neki* constitute two P-phrases. While *loba* is assigned L*H_P tonal specification, *neki* lacks phrasal prominence.

As Figure 3-12 displays, L*H_P pitch specification initiates a rising contour on *loba*, where L* associates with the first syllable and the H_P is manifested on the last syllable of the

constituent. Following the pitch rise on *loba*, the F_0 track undergoes a smooth fall on the QP *neki* due to the P final boundary tone L_I.

3.5.1.1.4 In alternative question IPs

In alternative questions, the addressee is given two alternative choices in the questions themselves, out of which the addressee needs to select only one. Although, similar to yes/no questions, such questions are asked with the help of QC *=nɛ*, they cannot be answered with only *yes* or *no*. For instance, we can consider the alternative question given in (21) where the listener is expected to choose one of the two options: *ram zabɔ* 'Ram will go' and *hɔri zabɔ* 'Hari will go'. The QC *=nɛ* adjoins the finite verb of the first option *zabɔ=nɛ* and thus works as a marker between the two options.

	L	H*		L_I
21.	[[ram	za-bɔ=nɛ]$_P$	[hori	za-bɔ]$_P$]$_I$
	Ram	go-FUT3=QC	Hari	go-FUT3

Who between Ram and Hari will go?

The tonal specifications given in (21) finds there intonational manifestation as given in Figure 3-13.

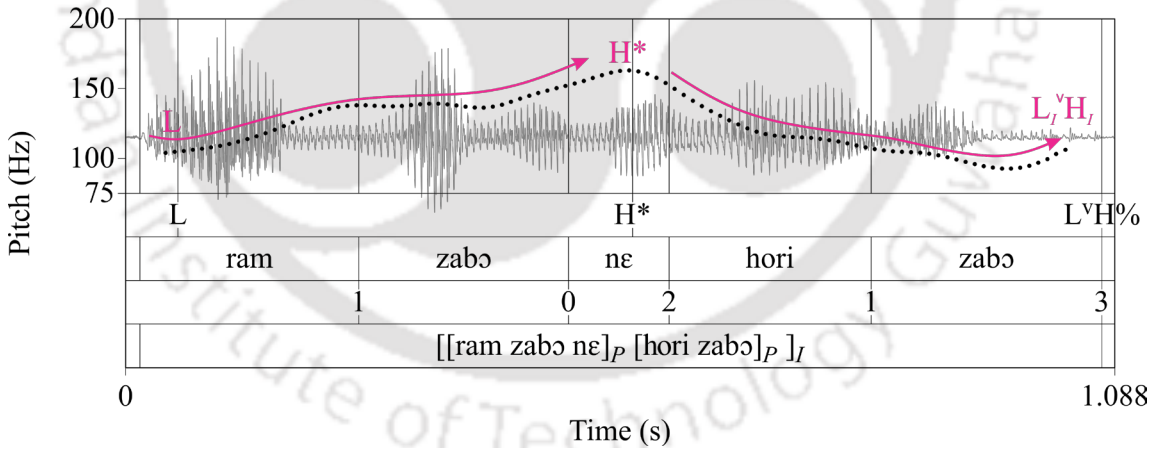


Figure 3-13 The alternative question *ram zabɔ=nɛ hori zabɔ* (Who between Ram and Hari will go?) shows how *=nɛ* bears the final accent H* of the IP. The first option *ram zabɔ=nɛ* forms P-phrase here.

Figure 3-13, representing the IP given in (21), shows how the first option *ram zabɔ* together with the QC constitutes a P-phrase (*ram zabɔ=nɛ*) demarcated by L tone on the first syllable and H* on the QC. The pitch contour smoothly falls following the pitch accent on *=nɛ* since the final syllable of the IP is specified with $L^{v}H\%$ tone. Establishing itself as

one from the category of MFMs, *=nɛ* is never followed by another pitch accent within the IP.

3.5.1.1.5 In declarative question IPs

Syntactically there is no difference between declarative sentences and declarative questions. While the former normally end with falling pitch, the later end with rising intonation. The answer to declarative questions is assumed as 'yes'. (Gunlogson, 2002; Truckenbrodt, 2009). In Assamese also, declarative sentences can be uttered as questions by raising the pitch on the final constituent. The prosodic phrasing of the declarative question given in (22) demonstrates that such questions have bitonal pitch accent (L*+H) on their final P-phrase which is followed by a rising boundary tone (L_IH_I).

		L*+H	L_IH_I
22. [[narajɔn-ɛ]$_P$	[rɔmɛn-ɔk]$_P$	[lo-i	n-ahi-lɛ]$_P$]$_I$
Narayan-NOM	Ramen-ACC	take-PRF	not-come-PST3

Didn't Narayan bring Ramen?

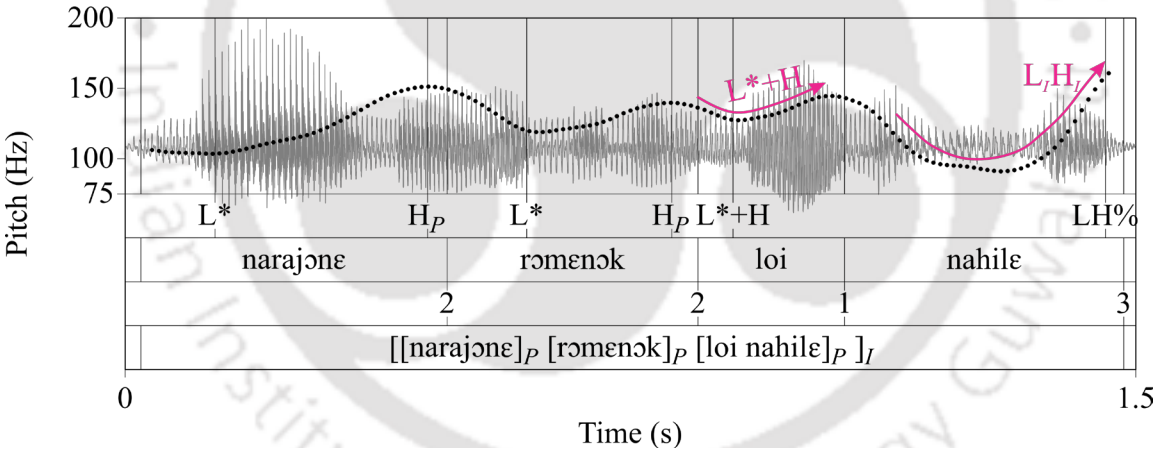


Figure 3-14 The declarative question, *narajɔnɛ rɔmɛnɔk loi nahilɛ?* (Didn't Narayan bring Ramen?), shows that the bitonal pitch accent (L*+H) aligns with *loi* and the rising boundary tone (L_IH_I) is realised on the final syllable.

In Figure 3-14, the pitch accent L*+H is assigned to the first syllable of the phrase *loi nahilɛ*: the L* is manifested on the first mora of *loi* and the trailing H is realised immediately after the starred tone. Under the influence of the rising boundary tone L_IH_I, the pitch track rises on the IP final syllable again after taking a dip.

3.5.1.1.6 In Wh-question IPs

In *Wh*-questions, *Wh*-words bear the final accent of the IP. The intonational realisation of the Wh-word is identical to the prosodic realisation of contrastive focus (henceforth CF) words in SCA. Similar to CF pitch accent realisation (see chapter 4 for detailed analysis), a question word receives the IP final pitch accent. In (23), the question word *kʊnɛ* receives the right most accent of the IP.

	L*H$_P$			L$_I$
23.	[[kʊn-ɛ]$_P$	[rɔmɛn-ɔk]$_P$	[lo-i	ah-il-ɛ]$_P$]$_I$
	Who-NOM	Ramen-ACC	take-PRF	come-PST-3
	Who did bring Ramen?			

The F_0 contour of the IP given in (23) has been illustrated in the Figure given below.

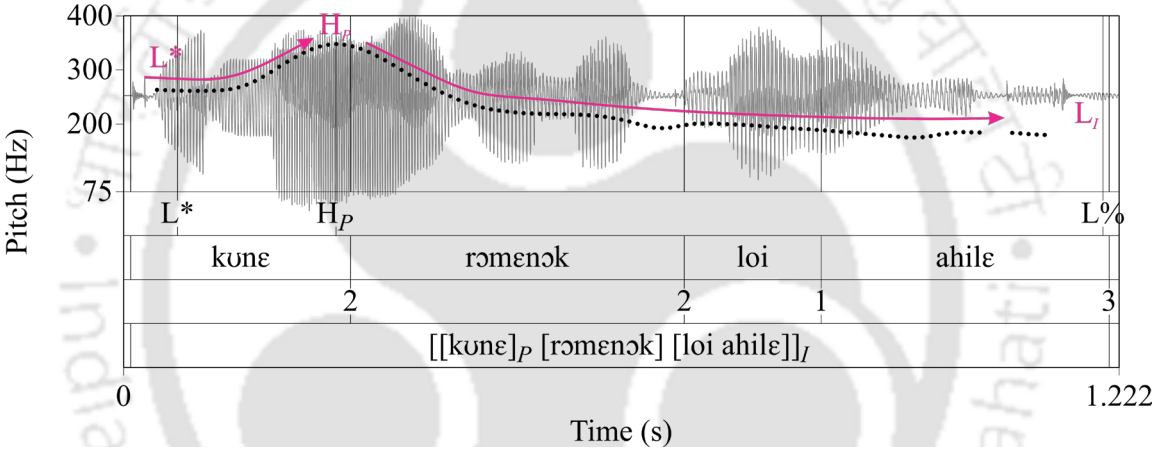


Figure 3-15 The *Wh*-question, *kʊnɛ rɔmɛnɔk loi ahilɛ?* 'Who did bring Ramen?', has its IP final accent on the question word *kʊnɛ*, realised with L*H$_P$ pitch pattern.

Figure 3-15, representing the IP given in (23), illustrates how the only pitch rise in the IP takes place on the question word. The pitch accent L* is realised on the first syllable of the *Wh*-word *kʊnɛ*, which is then demarcated by a high boundary tone (H$_P$). Similar to CF realisation, the pitch contour following the question word maintains a smooth fall until the right IP boundary.

3.5.1.2 SCA non-final P-phrases

After the discussion on intonational realisation of final constituents in SCA IPs vis-à-vis different sentence types in the preceding section, in this section, SCA tonal specification in non-final P-phrases have been investigated; these phrases are optional in nature. In SCA, compared to IP final P-phrases, non-final P-phrases maintain a simple prosodic structure that exhibits LH melody, which makes it typologically identical to other SALs. These

phrases, as can be seen in all the exemplified sentences, always demonstrate rising contours. Irrespective of any IP type, heads are mostly assigned low pitch accent L* on the leftmost prominent syllable and high boundary tone H_P on the final syllable. If we consider the declarative question in (22), mentioned again in (24) below, for convenience, we see that the two non-final P-phrases *narajɔnɛ* and *rɔmɛnɔk* have same tonal specifications: L*H_P.

L* H_P L* H_P

24. [[narajɔn-ɛ]$_P$ [rɔmɛn-ɔk]$_P$ [lo-i n-ah-il-ɛ]$_P$]$_I$

Narayan-NOM Ramen-ACC take-PRF not-come-PST-3

Didn't Narayan bring Ramen?

The intonational contour of the sentence has been demonstrated in Figure 3-16 which justifies the tonal specifications demonstrated in (24).

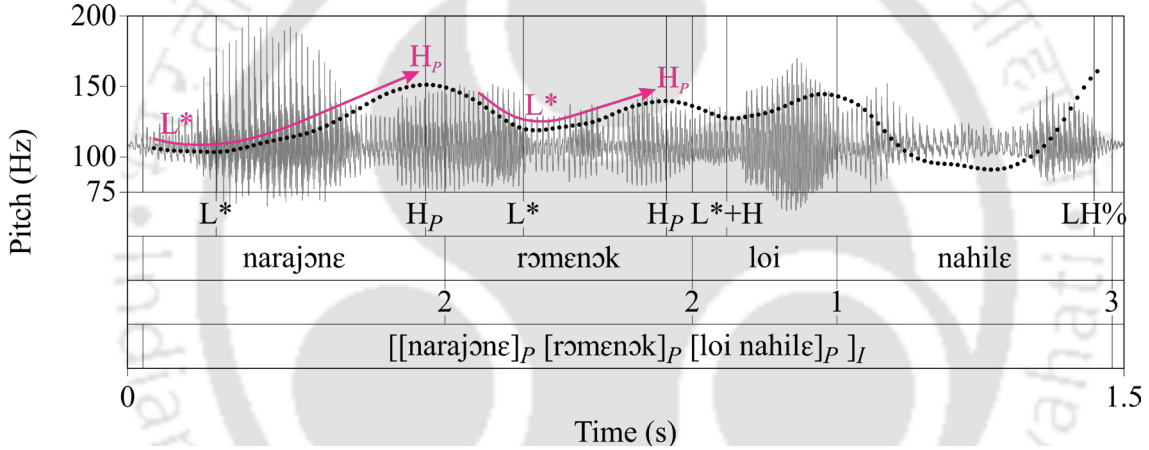


Figure 3-16 The declarative question, *narajɔnɛ rɔmɛnɔk loi nahilɛ?* 'Didn't Narayan bring Ramen?' shows that the non-final P-phrases *narajɔnɛ* and *rɔmɛnɔk* are characterised by L*H_P pitch contour.

In both P-phrases, *narajɔnɛ* and *rɔmɛnɔk*, the low pitch accent L* aligns with the first mora of each P-phrase. After docking at its lowest value on the first syllable, the F_0 curve rises smoothly until the final syllable of corresponding P-phrases where the high boundary tone H_P aligns with the first mora of the final syllable. In case of *narajɔnɛ*, H_P is realised closer to the P-phrase boundary since the phrase ends with /ɛ/, which is assigned the first mora of the final syllable. On the other hand, in the second P-phrase *rɔmenɔk*, we see an early realisation of the pitch peak. In the P-phrase, the final syllable *nɔk* is a heavy syllable with two morae, out of which the high P-phrase boundary tone H_P aligns with the first mora. As a consequence, we get an advanced pitch peak as it is realised on the vowel of the final syllable after which the F_0 value declines smoothly.

In the declarative IP (25), there are three non-final P-phrases *rɔmɛnɔr*, *gab^{h}ɔru* and *b^{h}ɔnijɛkzɔni* each of which demonstrate rising contours with L*H$_P$ pitch contour.

	L* H$_P$	L* H$_P$	L* H$_P$		
25.	[[rɔmɛn-ɔr]$_P$	[gab^{h}ɔru]$_P$	[b^{h}ɔnijɛk-zɔni]$_P$	[gus-i]$_P$	go-l]$_I$
	Ramen-GEN	young	sister-CLS	move-PRF	go-PST3

Ramen's younger sister went away.

Figure 3-25 demonstrates the intonational realisation of the IP given in (25) where only non-final P-phrases are highlighted.

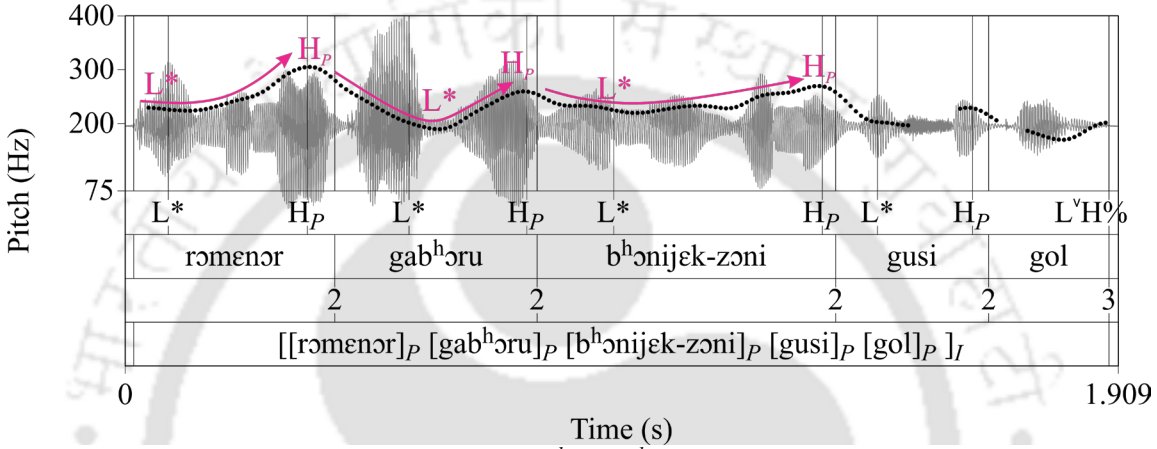


Figure 3-17 In the utterance *rɔmɛnɔr gab^{h}ɔru b^{h}ɔnijɛk-zɔni gusi gol* (Ramen's younger sister went away) the non-final P-phrases *rɔmɛnɔr, gab^{h}ɔru* and *b^{h}ɔnijɛkzɔni* instantiate LH melody with L*H$_P$ pitch contour.

In the first P-phrase, we see an L* realisation on the first syllable, and an early H$_P$ realisation at the P-phrase boundary since the final syllable is a heavy syllable with a coda consonant (see §3.4.1 for details). In the next two P-phrases, the final syllable is monomoraic; as a result the high boundary tone H$_P$ is realised adjacent to the P-phrase boundary. However, in these two P-phrases, the realisation of low pitch accent L* is little delayed. In the second P-phrase *gab^{h}ɔru*, the pitch drop occurs on the second syllable instead of the first syllable as a consequence of the local phonetic effect of the depressor consonant [b^{h}].

In the third P-phrase also, we can see a delayed realisation of the low pitch accent L*. However, such delayed L* realisations have not been found to be phonologically different from those realised on the first syllable. Although the rise within the third phrase is not smooth enough in comparison with the first two P-phrases, phonologically the phrase has the same tonal specification (L*H$_P$) as other non-final P-phrases.

Further, there are instances when non-final P-phrases encompass larger sequence of constituents as it is the case in sentence (20) where the entire pre-verbal string constitutes a single P-phrase. In it, the non-final P-phrase comprises as many as three P-words: *ramɔr*, *pɔra* and *kiba*. The sentence has been repeated in (26) for ready reference.

	L*		H_P		
26.	[[ram-ɔr	pɔra	kiba]$_P$	[lɔ-ba	neki]$_P$]$_I$
	Ram-GEN	from	something	take-PST2	QP

Will you take something from Ram?

The intonational contour representing IP (26) has been illustrated below in Figure 3-18.

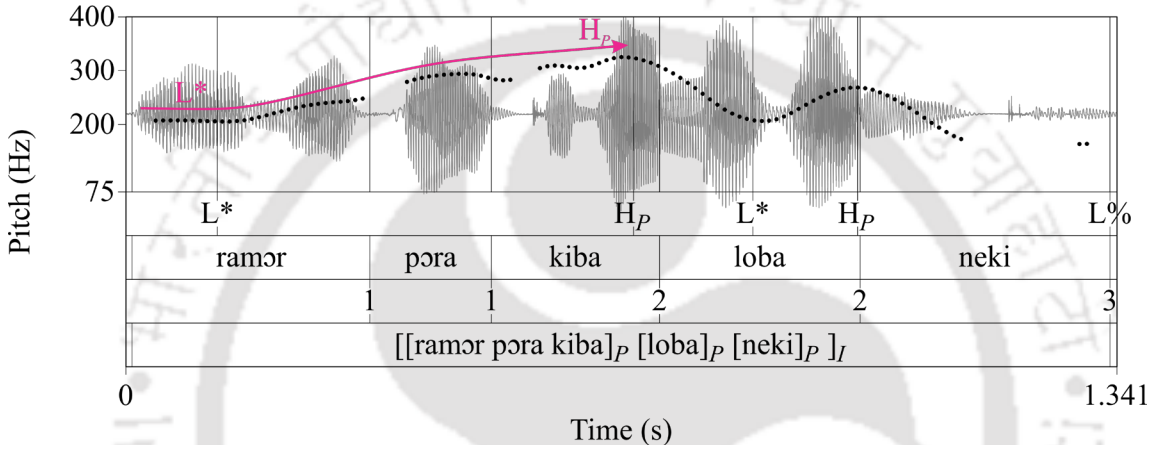


Figure 3-18 In the yes/no question *ramɔr pɔra kiba lɔba neki* 'Will you take something from Ram?' the non-final P-phrase comprises three P-words: *ramɔr*, *pɔra* and *kiba*. The pitch pattern within this longer string of P-phrase is L*H$_P$.

In Figure 3-18, though the non-final P-phrase contains three P-words, it instantiates a smooth rise with L*H$_P$ pitch contour. The F_0 track docks on the nucleus of the first syllable *ra* and subsequently continues to climb until the final syllable of *kiba*. In spite of the phrasal length, the smooth contour of L*H$_P$ has been maintained in the phrase *ramɔr pɔra kiba*.

However, the F_0 interpolation between left-most prominent syllable and the final syllable in P-phrases is not always realised as a smooth rise as has been described in the above three examples. Sometimes compound words with two lexical items demonstrate a bitonal pitch accent L*+H realised on the left-most prominent syllable of the compound. For instance, the second P-phrase in (27) is designated with the bitonal pitch accent L*+H on its first syllable, which is the most prominent syllable in the phrase, and the final syllable is specified with the P-phrase demarcating boundary tone H$_P$.

	L*	H_P	L*+H		H_P		
27.	[rɔmɛn-ɛ]$_P$		[dorza-r	sabi-pat]$_P$	[milɔn-ɔk]$_P$		[di-l-ɛ]$_P$]$_I$
	Ramen-NOM		door-GEN	key-CLS	Milan-ACC		give-PST-3

Ramen gave the door-key to Milan.

The IP given in (27) has been intonationallly represented in Figure 3-19.

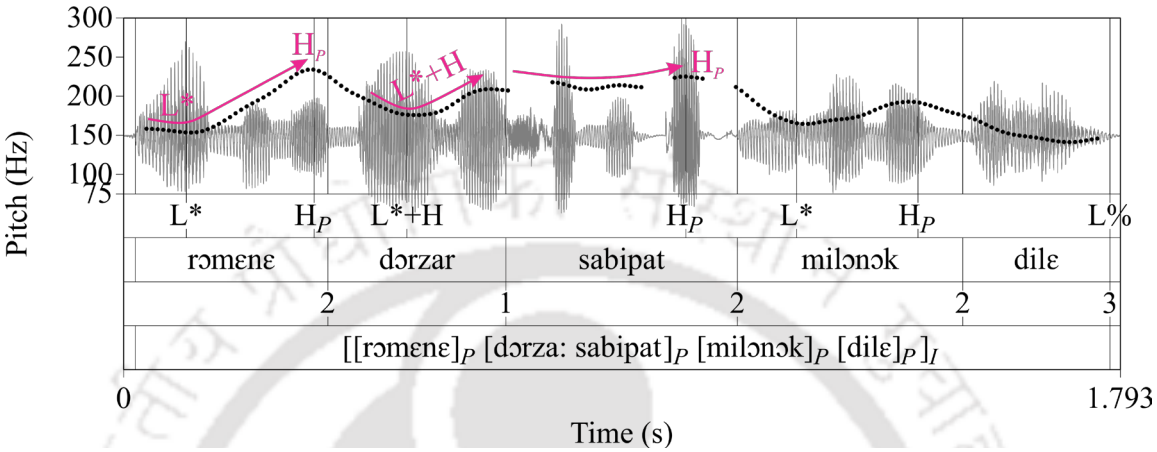


Figure 3-19 In the IP *rɔmɛnɛ dɔrzar sabipat milɔnɔk dilɛ* 'Ramen gave the door-key to Milan', the second P-phrase containing the compound construct *dɔrzar sabipat* demonstrates a rise on the second syllable due to the bitonal pitch accent L*+H, which is followed by a plateau until the P-phrase final syllable *pat*.

The second P-phrase in Figure 3-19 does not show a smooth interpolation between the left-most prominent syllable, which is here the first syllable *dɔr*, and the final syllable *pat*. As schematised in (27), since the P-phrase is assigned the bitonal pitch accent L*+H, after docking at its lowest value on the first syllable *dɔr*, the F_0 contour undergoes a pitch rise on the very next syllable *zar*. Following the realisation of the high trailing tone of the L*+H pitch accent, the F_0 contour maintains a plateau until the final syllable, which materialises the high boundary tone H_P of the P-phrase.

The sentences given in (24), (25), (26) and (27), and all other SCA sentences exemplified in this chapter demonstrate how non-final P-phrases in SCA maintain rising contours irrespective of sentence type. Although there may be differences in the phonetic realisation of F_0 contours, phonologically such phrases are characterised by low pitch accent L* and high boundary tone H_P associated phrase initially and finally respectively.

3.5.1.3 Summary

In the above discussion on intonational configuration in SCA IPs, it can be understood that, with an exception to all new declarative IPs, in all other sentence types, the final P-

phrase (normally verb) bears IP final pitch accent and right aligns with IP boundary tone. There may be some phonological prominence in the final P-phrase of a declarative IP as well, however, it requires more studies for confirmation. As far as non-final P-phrases are concerned, all IP types demonstrate a repeated LH melody or rising contour. The inventory of intonational pitch contours in different SCA sentence types have been summed up below in Table 3-1.

Table 3-1 The table displays the inventory of pitch accents and boundary tones attested in SCA in different IP types[26]

<table>
<tr><th colspan="4">SCA Prosodic Phrasing</th></tr>
<tr><th colspan="2">IP type</th><th>Non-final P-phrases</th><th>IP final pitch accents</th></tr>
<tr><td colspan="2">All new declarative</td><td rowspan="7">L*H_P
or
L*+H H_P</td><td>L*H_P L_I</td></tr>
<tr><td colspan="2">Incomplete declarative</td><td>L*H_P L_IH_I</td></tr>
<tr><td rowspan="2">Yes/ No question</td><td>with =nɛ</td><td>LH* H_I</td></tr>
<tr><td>with neki</td><td>L*H_P L_I</td></tr>
<tr><td colspan="2">Alternative question (asked with=nɛ)</td><td>L H* L_I</td></tr>
<tr><td colspan="2">Declarative question</td><td>L*+H L_IH_I</td></tr>
<tr><td colspan="2">Wh-question</td><td>L*H_P L_I</td></tr>
<tr><th colspan="4">Tonal Inventory</th></tr>
<tr><td colspan="2">Pitch accents</td><td colspan="2">L*, L*+H, H*</td></tr>
<tr><td colspan="2">P-phrase boundary tones</td><td colspan="2">H_P</td></tr>
<tr><td colspan="2">IP boundary tones</td><td colspan="2">L_I, L_IH_I, H_I</td></tr>
</table>

3.5.2 NVA IPs

Following the pattern of the previous section on SCA IPs, this section is divided into §3.5.2.1 and §3.5.2.2 which discuss the intonational phonology of final and non-final P-phrases in NVA IPs respectively.

[26] This table excludes CF pitch accents, which will be extensively discussed in the next chapter. Further in the table, wherever L_I (not L_IH_I) is the final boundary tone, it is always replaceable with L_I^ʸH_I (or L^ʸH%).

3.5.2.1 NVA IP final P-phrases

3.5.2.1.1 In declarative IPs

Compared to SCA declarative IPs (see §3.5.1.1.1), NVA assigns high pitch accent (H*) on the final constituent in all new declarative utterances. In NVA, similar to SCA, pre-verbal constituents in the IP display rising contours. For instance, in (28) the pitch accent H* falls on the verb *dilu*, which occupies IP final position.

H* L_I

28. [[azi teo-k]$_P$ [d^hɔmki]$_P$ [di-l-u]$_P$]$_I$

today he-ACC scold give-PST-1

Today, I scolded him.

The annotated intonational contour of the IP given in (28) has been illustrated in Figure 3-20.

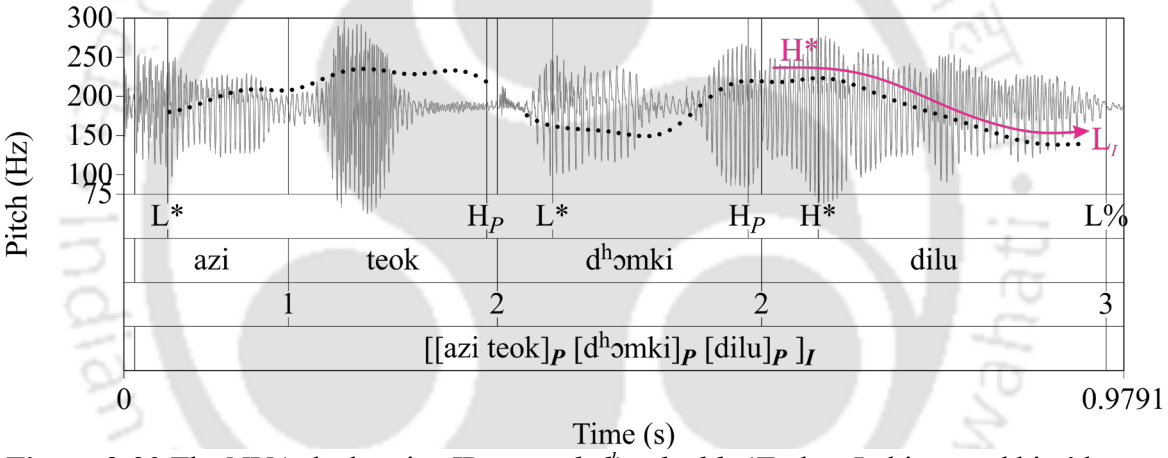


Figure 3-20 The NVA declarative IP *azi teok d^hɔmki dilu* 'Today, I objurgated him' bears IP final pitch accent H* on the first syllable of *dilu*.

In (28), the final constituent *dilu* bears the IP final pitch accent H* on its first syllable. Figure 3-20 shows the H_P boundary tone of the P-phrase *d^hɔmki* which is realised on its final syllable. The F_0 track rises slightly on the first syllable of *dilu*. This kind of post-lexical prominence has not been observed in SCA declarative IPs.

In case of complex predicates also, in NVA, H* pitch accent is assigned to the first component of the predicate on its first syllable. For instance in (29), the IP concludes with a complex predicate *khai ase*, which is characterised by high IP final pitch accent H* on its first syllable, and low IP boundary tone L_I on the final syllable.

			H*	L_I
29.	[[nɔjɔn-ɛ]$_P$	[amlok^{h}i]$_P$	[k^{h}a-i	as-ɛ]$_P$]$_I$
	Nayan-NOM	gooseberry	eat-PRF	be-PST3

Nayan is eating gooseberry.

The way the IP given in (29) is manifested in terms of F_0 contour has been displayed in Figure 3-21.

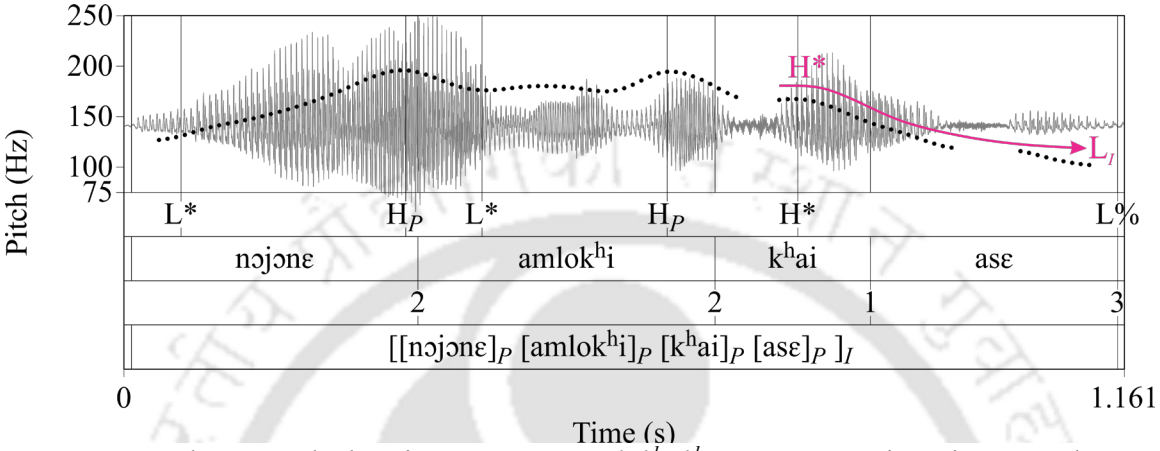


Figure 3-21 The NVA declarative IP *nɔjɔnɛ amlok^{h}i k^{h}ai asɛ* 'Nayan is eating gooseberry' bears IP final pitch accent H* on the first component of the complex predicate *k^{h}ai asɛ*.

The intonation contour of the IP given in (29) has been demonstrated in Figure 3-21 which shows how the first component of the complex predicate *k^{h}ai asɛ* is designated by H* pitch accent followed by a smooth fall caused by the IP boundary tone L_I.

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_P and L_I respectively).

3.5.2.1.2 In incomplete declarative IPs

An incomplete declarative IP maintains the same position for sentence final pitch accent placement as does the neutral declarative nucleus i.e. the first syllable of the final constituent. This syllable is assigned with H* pitch accent at the post-lexical level. Although we assume that the final constituent constitutes a P-phrase and possesses low boundary tone (L_P), the boundary tone is overridden by IP final rising boundary tone L_IH_I.

In (30), the finite verb *dʰɔillak*[27] bears the pitch accent H* on its first syllable *dʰɔil*, and right-aligns with the prosodic edge of the IP.

				H* L_IH_I
30.	[[rɔmɛn-ɛ	zeita]$_P$	[kaind-ba]$_P$	[dʰɔil-lak]$_P$]$_I$
	Ramen-NOM	when	cry-PRF	hold-PST3

When Ramen started to cry,

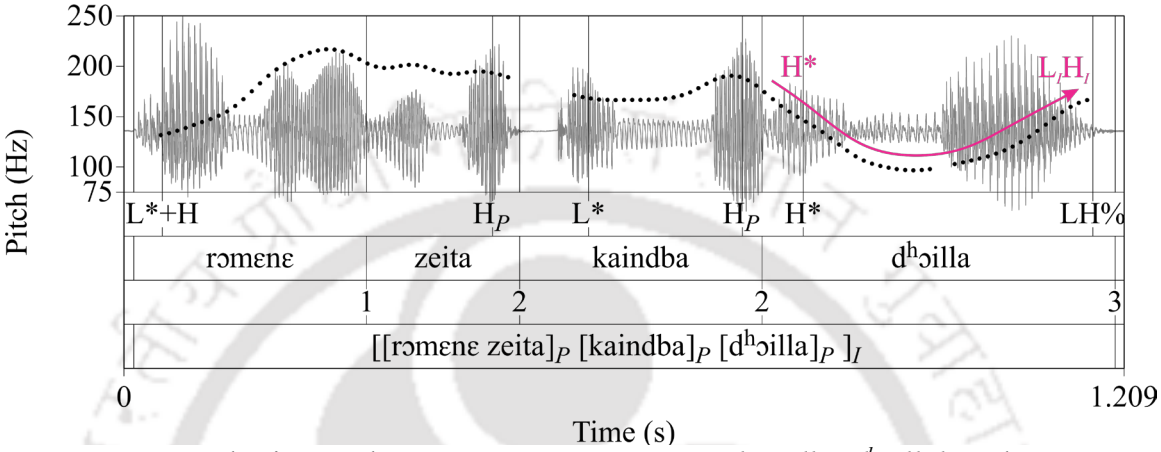


Figure 3-22 In the incomplete utterance *rɔmɛnɛ zeita kaindba dʰɔillak* 'When Ramen started to cry,' the IP final pitch accent H* falls on the first syllable of *dʰɔillak*. The IP boundary tone LH% causes a drastic pitch rise on the final syllable of the IP.

In Figure 3-22, although the first syllable of the final constituent seems to show an interpolation between H_P of *kaindba* and L_I of L_IH_I IP boundary tone , H* nuclear accent has been assigned to it. This proposal gets its motivation from the way syllables in the said position in complete declaratives (in (28) for instance) receive IP final pitch accent.

Thus complete and incomplete declarative utterances are not different from each other as far as IP final pitch accent assignment is concerned. It is only in terms of boundary tones that the two sentence types differ intonationally from each other. While a neutral IP receives L_I boundary tone at the end, an incomplete IP is characterised by L_IH_I boundary tone.

[27] Verbs ending in vowels get third person inflectional suffix *–lak* in Kamrupi, for that matter NVA. For instance, *xi kɔ-lak* 'he say-PST3' (Goswami, 1958, p. 113; Das, 1990). Although the realisation of the final /k/ is not always audible, it has been retained in the orthographic representations since underlyingly /k/ is always there. However, in the figures, the final /k/ has not been reported in the examples where the sound is not audible.

3.5.2.1.3 In yes/ no question IPs

Just as SCA employs *=nɛ* (QC) and *neki* (QP) to ask yes/no questions, in NVA we find *=na* and *neki* being used respectively to ask the said questions. As far as *neki* is concerned, NVA exhibits intonational similarity to SCA *neki* questions, where the finite verb forms a P-phrase characterised by L*H$_P$ pitch specification. The QP *neki*, though forms a P-phrase, lacks post-lexical prominence. In the yes/no question (31), asked with QP *neki*, the finite verb *lɔbi* is assigned L*H$_P$ pitch specification since it forms a P-phrase, and *neki* is not assigned any intonational prominence.

			L* H$_P$		L$_I$
31.	[[ram-ɔr	pɔra	kiba]$_P$	[lɔ-bi]	[neki]$_P$]$_I$
	Ram-GEN	from	something	take-FUT2	QP

Will you take something from Ram?

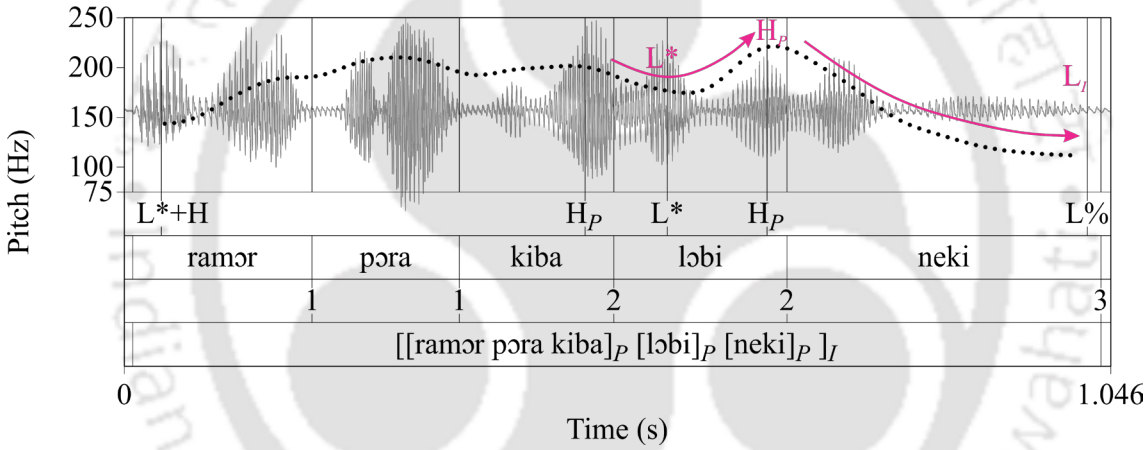


Figure 3-23 The NVA yes/no question *ramɔr pɔra kiba lɔbi neki* 'Will you take something from Ram?' shows how *lɔbi* forms a P-phrase and *neki* is left without any post-lexical prominence.

The intonational contour of sentence (31) has been given in Figure 3-23, which shows rising contour on the finite verb *lɔbi* as a result of the tonal specification L*H$_P$. Following the rise on *lɔbi*, the pitch track interpolates smoothly through *neki* to the IP boundary, which is associated with low IP boundary tone (L$_I$).

If we compare the IP final pitch accents given in Figure 3-23 and Figure 3-12, we see identical contours in the both. Therefore, we conclude that SCA and NVA adopt similar intonational contours to mark yes/no questions asked with the QP *neki*. However, in case of yes/no questions asked with QC *=na*, NVA maintains a difference vis-à-vis the phonetic realisation of the H* tone assigned to the QC. In (32), it has been schematically

exemplified how IP final constituents in NVA are intonationally specified in yes/ no question IPs asked with the QC *=na*.

L H* H_I

32. [[narajɔn-ɛ rɔmɛn-ɔk loi]$_P$ [aih-l-ak=na]$_P$]$_I$

Ram-GEN Ramen-ACC carry-PRF come-PST-3=QC

Has Narayan brought Ramen?

The QC *=na* , similar to SCA *=nɛ*, receives the final pitch accent of the IP and its host *lɔbi* receives another post-lexically assigned low tone on the first syllable *lɔ*[28]. In contradiction to the extra high pitch realisation in SCA at the IP boundary, in NVA the two high tones (H* and H_I) maintain a plateau at the IP boundary. Unlike SCA, where such IPs end with an excessive pitch rise, in NVA the F_0 track demonstrates a brief plateau after the rise. It has been proposed that this plateau is created by the sequence of two high tones H* and H_I.

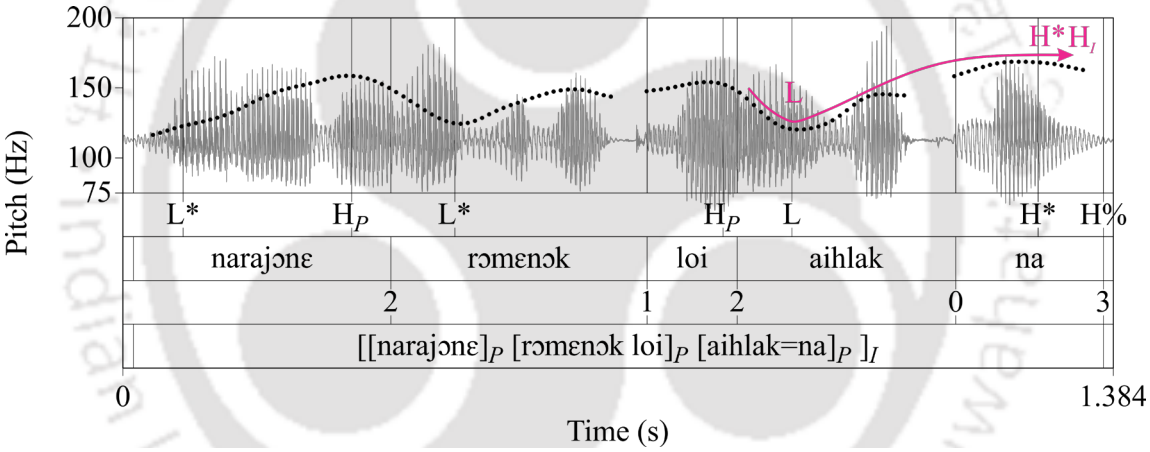


Figure 3-24 The NVA yes/no question *narajɔnɛ rɔmɛnɔk loi aihlak=na?* 'Has Narayan brought Ramen?' shows how *aihlak=na* constitutes a P-phrase and bears the pitch accent H* on the QC *=na* preceded and followed by L and H_I tone respectively.

The final prosodic phrase in Figure 3-24 demonstrates an IP final pitch plateau on the final syllable (*=na*). NVA accommodates two identical tones (H* and H_I) on the same syllable: the QC =na, like morphological focus markers (see chapter 5), always receives a high pitch accent (H*) and the question IP boundary is assigned a high prosodic boundary tone (H_I).

[28] How low tone is assigned to the first syllable in P-phrases initiated by morphological focus markers has been discussed in chapter 5.

3.5.2.1.4 In declarative question IPs

In declarative questions, apart from raising the intonation (L_IH_I) on the peripheral syllable, NVA speakers assign a rising pitch accent (L*+H) to the constituent regarding which they express their doubts. For instance, in (33) the speaker verifies whether Ramen has been brought by Narayan; as a consequence *rɔmɛnɔk* has been accented on its first syllable, and the IP final constituent *aihlak* is designated by L_IH_I boundary tone on its final syllable.

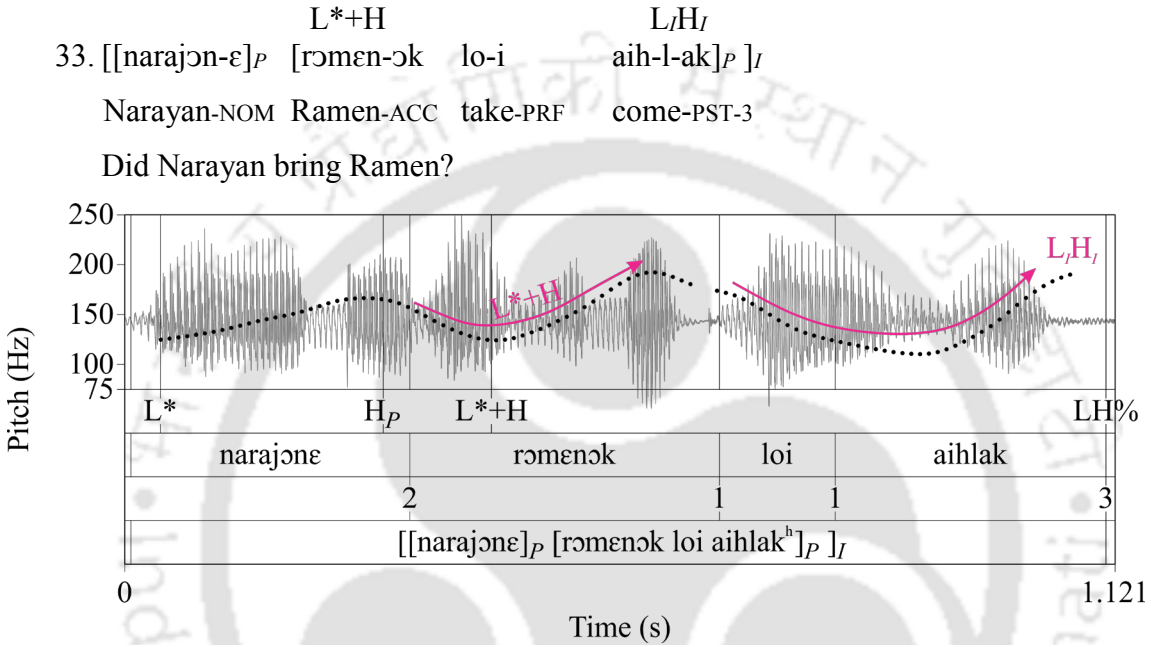


Figure 3-25 The NVA declarative question *narajɔnɛ rɔmɛnɔk loi aihlak?* 'Did Narayan bring Ramen?' shows how the string *rɔmɛnɔk loi aihlak* constitutes a P-phrase, which bears L*+H pitch accent on its first and L_IH_I boundary tone on the last syllable.

In Figure 3-25, *rɔmɛnɔk* is characterised by steep rise, which starts at its first syllable and spreads over the next two syllables. Subsequently, the F_0 track interpolates between the trailing high tone of the pitch accent L*+H and the initial low tone of the IP final rising boundary tone L_IH_I. Finally, the F_0 contour undergoes a steep rise on the last syllable of the IP. Thus we see that SCA and NVA adopt similar intonational strategies while framing declarative questions.

3.5.2.1.5 In Wh-question IPs

Superficially, NVA *Wh*-questions show similarity with their counterparts in SCA: *Wh*-words are produced with a rising contour. However, we propose that the rising contour produced on NVA question words are phonologically different from those seen on SCA

Wh-words. In contradiction to SCA's L*H$_P$ pitch pattern on *Wh*-words, we propose that rises on NVA *Wh*-words are caused by bitonal pitch accent L*+H. This proposal gets its motivation from the segmental alignment of the high tone of the LH sequence. In SCA, question words form P-phrases and the high tone is realised adjacent to the P-phrase boundary. On the other hand, in NVA, the high tone is realised before the prosodic boundary of the question word. The *Wh*-question (34) demonstrates how the *Wh*-word *kuni* receives the bitonal pitch accent L*+H on its first syllable.

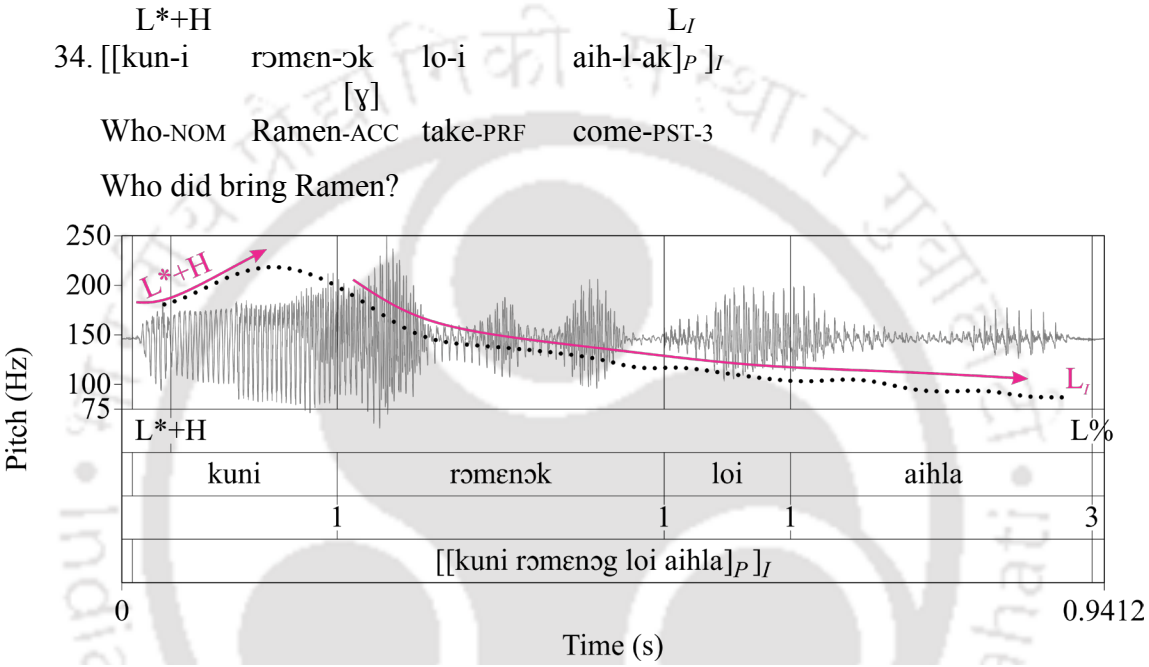


Figure 3-26 The *Wh*-question, *kuni rɔmɛnɔk loi aihlak?* 'Who did bring Ramen?', has its nuclear accent L*+H on the question word *kuni* followed by a global pitch compression.

In Figure 3-26, it has been shown that *kuni* undergoes pitch rise due to the realisation of the bitonal pitch accent L*+H on its first syllable; the starred tone aligns with the mora of the first syllable of *kuni* and the trailing high tone is manifested on the second syllable. The pitch peak realised on *kuni* is not realised adjacent to the right edge of the question word as it is the case with SCA question words (see Figure 3-15). The bitonal pitch accent L*+H is the prosodic head of the entire segmental string comprising the question word and the constituents following it.

3.5.2.2 NVA non-final P-phrases

Non-final P-phrases in NVA, identical to those in SCA, are characterised by LH melody which follow a simple structure with low pitch accents and high boundary tones: pitch accents are associated with the first syllable, whereas boundary tones with the concluding

syllable of P-phrases. These tones align with the first mora of the syllables they are associated with. The pitch rise on each P-phrase is lower than that of the preceding P-phrase. Depending on the length of a stretch constituting a non-final P-phrase, the realisation of the interpolation between pitch accent and boundary tone may vary. When such phrases are small, we get smooth rise contours designated by L*H$_P$ pitch contour. For instance, in the sentence given in (35), we have three non-final P-phrases, *nɔgɛnɛ*, *nɔjɔnɔk* and *mala* each of which are specified by LH melody.

	L* H$_P$	L* H$_P$	L*H$_P$	H* L$_I$
35.	[[nɔgɛn-ɛ]$_P$	[nɔjɔn-ɔk]$_P$	[mala]$_P$	[k^{h}uiz-lak]$_P$]$_I$
	Nagen-NOM	Nayan-ACC	garland	ask-PST3

Nagen asked Nayan for a garland.

The intonational contour of IP (35) has been illustrated below in Figure 3-27 with the help of a ToBI TextGrid.

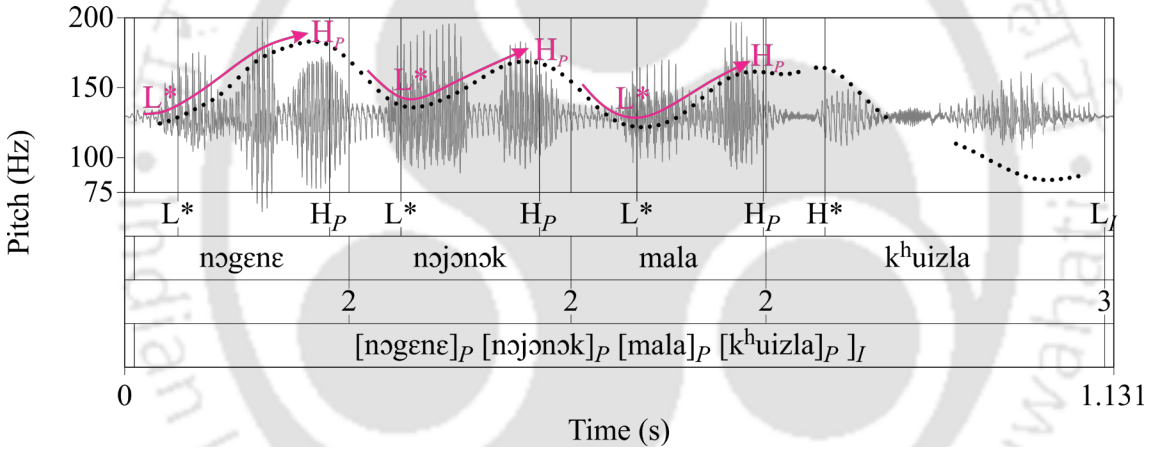


Figure 3-27 Each of the non-final P-phrases in the declarative IP *nɔgɛnɛ rɔjɔnɔk mala k^{h}uizlak* 'Nagen asked Nayan for a garland' displays rising contour.

In Figure 3-27, each non-final P-phrase demonstrates rising F_0 trend with phrase initial L* and final H$_P$. These repeated rising contours maintain a declining trend-line in that the high tone in each rise is realised lower than its preceding high tone.

With the expansion in the length of non-final P-phrases, the smoothness of pitch rise seen in Figure 3-27 may not be discernible. In (36), an IP has been served as an example which instantiates variation in the pitch contour realisation in non-final P-phrases in declarative sentences.

	L* H$_P$	L*+H	H$_P$	L* H$_P$	H* L$_I$
36.	[[rɔmɛn-ɛ]$_P$	[dɔrza-r	sabi-pat]$_P$	[milɔn-ɔk]$_P$	[di-lak]$_P$]$_I$

Ramen-NOM door-GEN key-CLS Milan-ACC give-PST3

Ramen gave the door-key to Milan

The intonational realisation of (36) has been demonstrated in Figure 3-28, where we can see three non-final P-phrases: *rɔmɛnɛ*, *dɔrzar sabipat* and *milɔnɔk*.

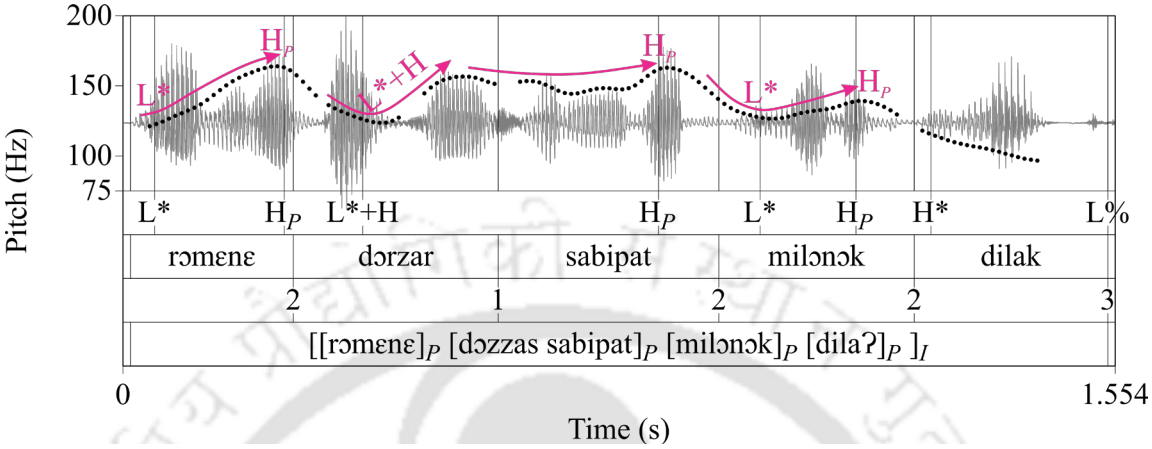


Figure 3-28 In the NVA declarative IP *rɔmɛnɛ dɔrzar sabipat milɔnɔk dilak* 'Ramen gave the door-key to Milan' the second P-phrase *dɔrzar sabipat* is characterised by L*+H pitch accent and H_P boundary tone.

In Figure 3-28, all the non-final P-phrases are characterised by rising contours. While the first and the third P-phrase demonstrates smooth interpolation between L* and H_P, the second P-phrase *dɔrzar sabipat* exhibits a P-phrase medial pitch plateau after a steep pitch rise on the second syllable of *dɔrzar*. In this work, such P-phrases are assumed to be characterised by L*+H pitch accent, and H_P boundary tone realised on the first mora of phrase final syllables.

Hence, we see how NVA maintains a simpler prosodic structure in non-final P-phrases compared to that of IP final constituents.

3.5.2.3 Summary

The above discussion reveals that NVA, like SCA, demonstrates greater intonational variation on the final prosodic constituent. This constituent, apart from demonstrating L*, L*+H and H* pitch accents, manifests L%, H%, and LH% boundary tones. Compared to IP final P-phrases, non-final P-phrases instantiate rising contours with L* and L*+H pitch accents and H_P boundary tone. Although NVA has a lot of intonational similarities with SCA as far as tonal specifications in the IP final P-phrases are concerned, we see a lot of variations as well. The tonal inventory of NVA has been displayed Table 3-2.

Table 3-2 The table displays the inventory of nuclear accents attested in SCA in different IP types

NVA tonal events			
IP type		**Non-final P-phrases**	**IP final pitch accents**
All new declarative		L*H$_P$ or L*+HH$_P$	H* L$_I$
Incomplete declarative			H* L$_I$H$_I$
Yes/ No question	with =*na*		LH* H$_I$
	with *neki*		L*+H L$_I$
Declarative question			L*+H L$_I$H$_I$
Wh-question			L*+HL$_P$ L$_I$
Tonal Inventory			
Pitch accents		L*, L*+H, H*	
P-phrase boundary tones		H$_P$	
IP boundary tones		L$_I$, L$_I$H$_I$, H$_I$	

In the next section, it has been discussed how SCA and NVA share similarities and differences with respect to prosodic and intonational marking of IPs.

3.5.3 SCA vs NVA IP final pitch patterns

It can be surmised from the preceding sections on intonational realisations of IPs in SCA and NVA that despite being varieties of the same language, the two varieties maintain certain intonational differences in the IP final constituent. In this section, the discussion is on the intonational differences that SCA and NVA maintain from each other with regard to different sentence types.

3.5.3.1 Intonational variation in the final P-phrase

In the earlier sections, it has been discussed how NVA demonstrates different pitch accent-boundary tone combinations on final constituents with regard to declarative and *Wh*-question IPs from those in SCA. These differences have been explicated below with intonational and segmental evidences.

3.5.3.1.1 Declarative IPs

NVA marks declarative IPs with high pitch accent (H*) on the final constituent, whereas SCA lays rising contour L*H$_P$ on the penultimate constituent. For instance in (37), IP final

pitch accent falls on *mala*, the object of the IP, and the verb *$k^huzil\varepsilon$* is left unaccented since it lacks post-lexical prominence.

			L*H$_P$	L$_I$
37.	[[nɔgɛn-ɛ]$_P$	[nɔjɔn-ɔk]$_P$	[mala]$_P$	k^huz-ilɛ]$_I$
	Nagen-NOM	Nayan-ACC	garland	ask-PST3
	Nagen asked Nayan for a garland.			

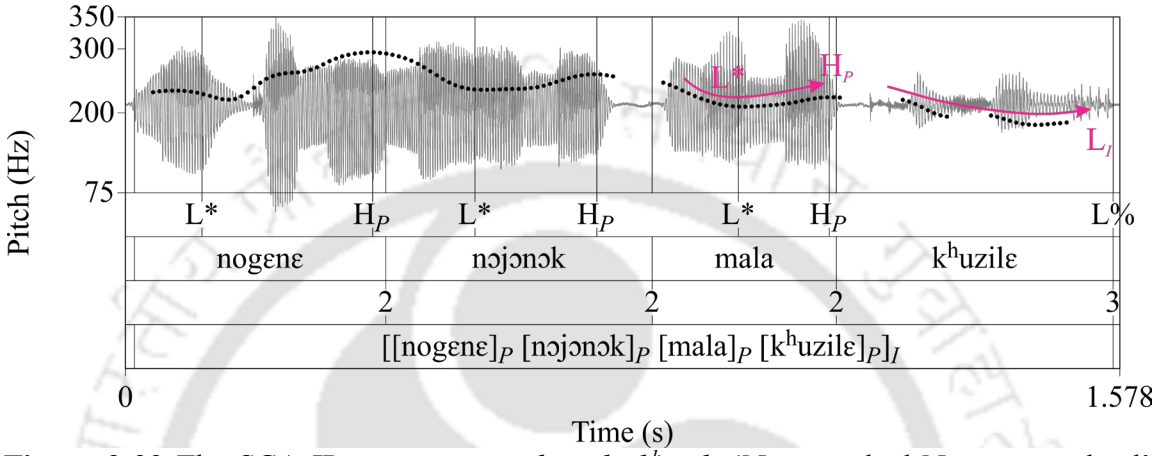


Figure 3-29 The SCA IP *nɔgɛnɛ nɔjɔnɔk mala $k^huzil\varepsilon$* 'Nagen asked Nayan a garland' shows how the penultimate constituent *mala* bears the IP final major pitch movement (L*H$_P$), and the final constituent *$k^huzil\varepsilon$* is left unaccented.

Sentence (37) has been represented intonationally in Figure 3-29, where it is apparent how the penultimate constituent in the IP is demarcated by L* pitch accent and H$_P$ boundary tone. Here, the first syllable of *mala* is assigned low pitch accent and its boundary is delimited by H$_P$; on the other hand the verb *$k^huzil\varepsilon$* is not assigned any prominence lending pitch accent at the post-lexical level.

Now if we consider the NVA variant of the sentence, we see a different pattern of IP final pitch accent assignment; here, unlike SCA, the final constituent receives pitch accent H* on its first syllable. For instance, in (38), the verb *$k^huizlak$* receives the high pitch accent H* on its first syllable and forms a P-phrase demarcated by L$_I$ boundary tones.

				H* L$_I$
38.	[[nɔgɛn-ɛ]$_P$	[nɔjɔn-ɔk]$_P$	[mala]$_P$	[k^huiz-l-ak]$_P$]$_I$
	Nagen-NOM	Nayan-ACC	garland	ask-PST-3
	Nagen asked Nayan for a garland.			

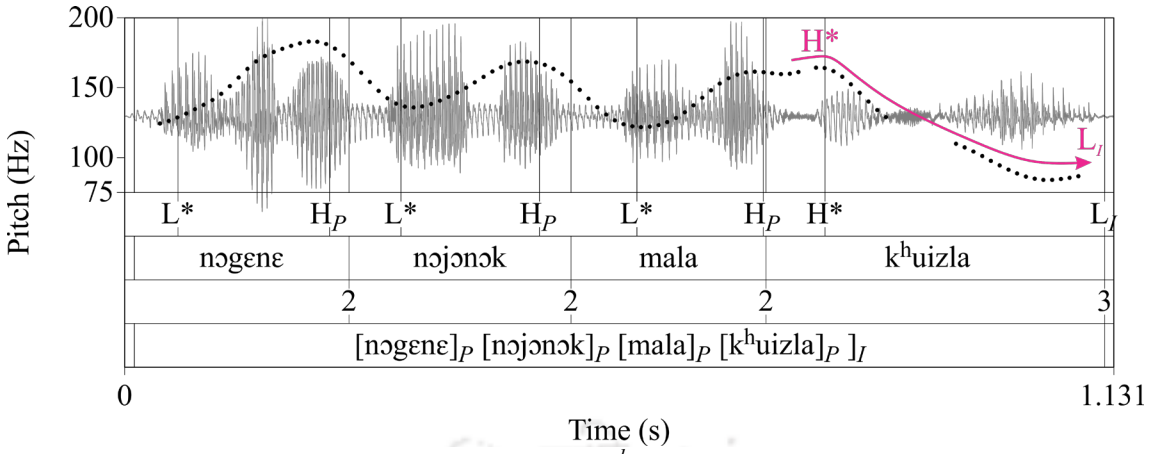


Figure 3-30 The NVA IP *nɔgɛnɛ nɔjɔnɔk mala k^{h}uizlak* 'Nagen asked Nayan for a garland' shows how the final constituent *k^{h}uizlak* receives H* nuclear accent and is demarcated by L_I IP boundary tone.

The observation that *k^{h}uizlak* forms a P-phrase is supported by segmental cues such as production of /k^h/ as [k^h] (aspiration retained). When *k^{h}uizlak* does not constitute P-phrase, i.e. when it occurs in post-focus environment, /k^h/ undergoes lenition (and becomes [x])[29].

The above two sentences from the two varieties demonstrate how SCA and NVA employ different nuclear pitch accents to WF declarative utterances. This difference in pitch accent marking becomes all the more evident in declarative utterances with complex predicates. In case of IPs with complex predicate, the first component in the predicate receives H* pitch accent in NVA, while the same constituent exhibits a rising pitch contour in SCA. In order to derive a better idea about the distinction, the following two IPs may be considered, each belonging to different varieties: (39) is from SCA and (40) from NVA. Although the sentences are semantically and structurally different from each other, both possess verb-verb complex predicates.

				L*H$_P$	L$_I^H_I$
39.	[[rɔmɛn-ɔr]$_P$	[gab^{h}ɔru]$_P$	[bhɔnijɛk-zɔni]$_P$	[gus-i]$_P$	[go-l]$_P$]$_I$
	Ramen-GEN	young	sister-CLS	move-PRF	go-PST3
	Ramen's younger sister went away.				

[29] Effects of focus on the post-focus sequence has been discussed in the fourth chapter, where we see how in post-focus environment aspirated plosives undergo intervocalic lenition across prosodic boundaries.

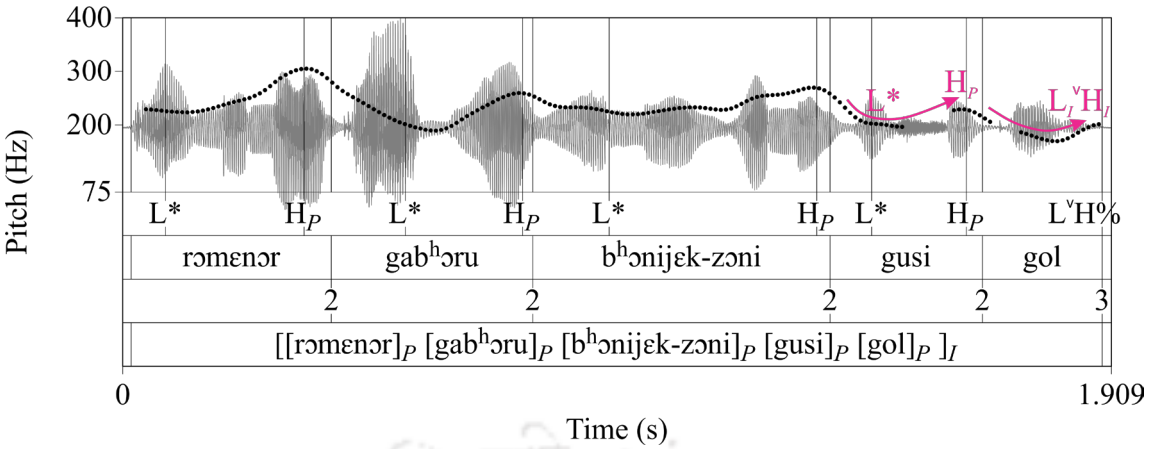


Figure 3-31 In the utterance *rɔmɛnɔr gab^{h}ɔru bhɔnijɛk-zɔni gusi gol* 'Ramen's younger sister went away' the first component *gusi* of the complex predicate *gusi gol* is marked by a rising pitch accent.

In (39), the first component *gusi* of the complex predicate *gusi gol* is demarcated by L*H$_P$ pitch contour, and the second component *gol* right aligns with IP boundary and hence manifests the IP boundary tone L$_I$^{v}H$_I$. As displayed in Figure 3-31, *gusi* demonstrates a rising contour, whereas the *gol* materialises L$_I$^{v}H$_I$ boundary tone.

In case of NVA declarative IPs with complex predicates, the entire predicate sequence forms a P-phrase, which is designated by H* pitch accent on the first syllable and L$_I$ boundary tone on the final syllable. The sentence given in (40) shows how the first component *zai* of the predicate *zai aihlu* bears high pitch accent H* on the first syllable and the second component *aihlu* receives the low IP boundary tone L$_I$ on the concluding syllable.

				H*	L$_I$
40.	[[mɔi]$_P$	[ram-ɔr]$_P$	[ghɔr-ɔr-pɔra]$_P$	[za-i	aih-l-u]$_P$]$_I$
	I	Ram-GEN	house-GEN-DAT	go-PRF	come-PST-1
	I returned from Ram's house.				

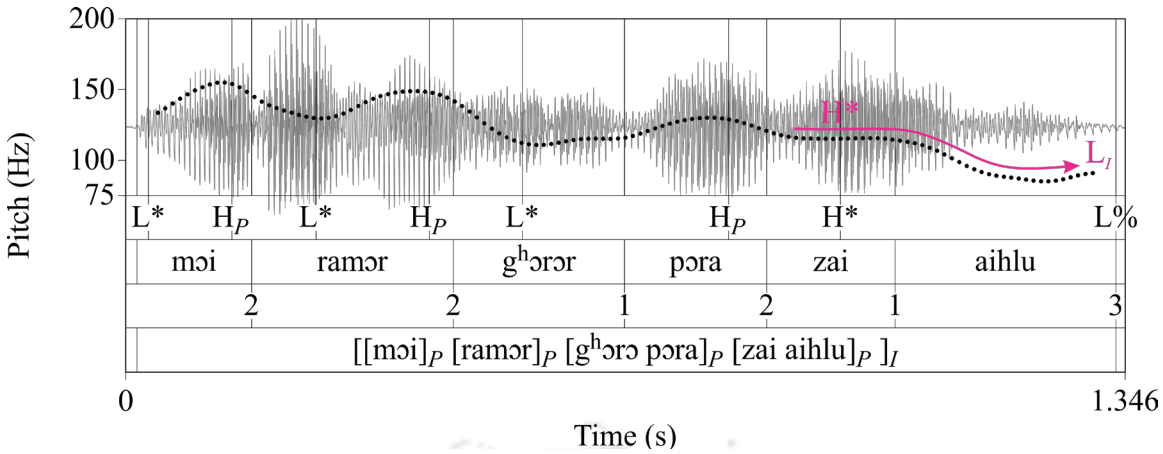


Figure 3-32 In the NVA IP *mɔi ramɔr ghɔrɔr-pɔra zai aihlu* 'I returned from Ram's house', the complex predicate *zai aihlu* forms P-phrase characterised by H* pitch accent and IP boundary tone L_I.

As it has been shown in Figure 3-32, the association of high pitch accent (H*) to *zai* initiates pitch plateau on the constituent, following which the pitch curve drops smoothly under the impact of IP boundary tone L_I.

3.5.3.1.2 Wh-question intonation

With regard to *Wh*-questions, NVA instantiates a phonologically different IP final pitch accent realisation from SCA. In both varieties, though *Wh*-words bear pitch accents displaying rising contour, they have different phonological motivations for the rise. *Wh*-words are assigned low pitch accent L* on the first syllable and high boundary tone H_P on the final syllable in SCA, whereas in NVA they are specified with a rising pitch accent L*+H on the first syllable. For instance, in the *Wh*-question (41), the *Wh*-word *kʊnɛ* is assigned with L*H_P pitch specification after which the segmental string is tonally underspecified until the IP boundary.

	L* H_P			L_I
41.	[[kʊn-ɛ]$_P$	[rɔmɛn-ɔk]$_P$	[lo-i	ah-il-ɛ]$_P$]$_I$
	Who-NOM	Ramen-ACC	take-PRF	come-PST-3
	Who did bring Ramen?			

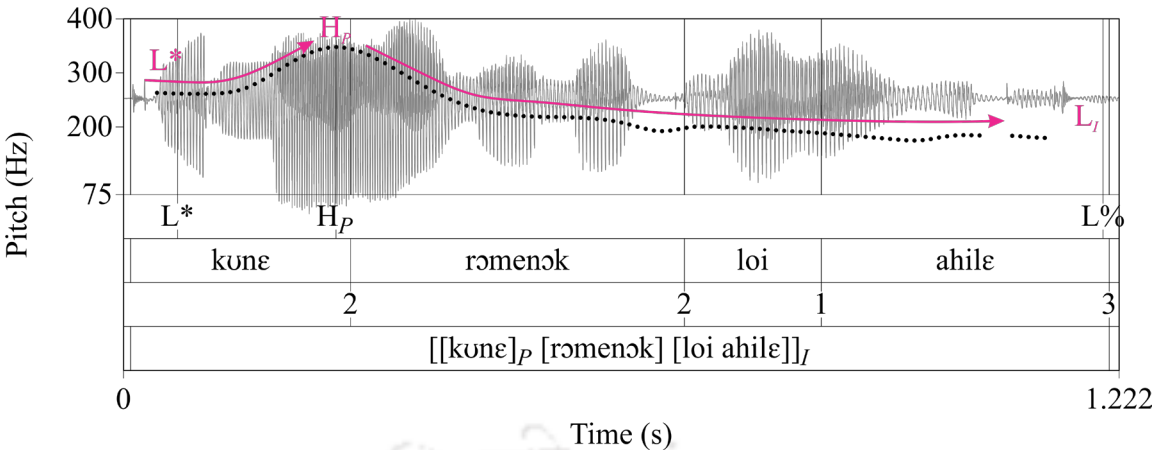


Figure 3-33 In the SCA *Wh*-question, *kʊnɛ rɔmenɔk loi ahilɛ?* 'Who did bring Ramen?', the high tone on the question word *kʊnɛ* is realised on its right edge emphasising its alignment to the boundary.

In Figure 3-33, we see how the pitch peak on the *Wh*-word *kʊnɛ* aligns with the right boundary of the word. Following the question word, the pitch contour maintains a smooth fall without any major pitch variation until IP boundary which is demarcated by L_I boundary tone.

As has already been discussed in §3.5.2.1.5, in NVA *Wh*-questions, *Wh*-words are characterised by rising pitch contour. This rise is, however, phonologically different from the rise seen on SCA question words. Unlike SCA *Wh*-questions, the pitch peak realised on question words in NVA *Wh*-questions does not align with the prosodic boundary of such words. In sentence (42), the *Wh*-word *kuni* is assigned a rising pitch accent L*+H on its first syllable.

	L*+H			L_P L_I
42.	[[kun-i	rɔmɛn-ɔk [ɣ]	lo-i	aih-l-ak]$_P$]$_I$
	Who-NOM	Ramen-ACC	take-PRF	come-PST-3

Who did bring Ramen?

In the left panel of Figure 3-34, it can be seen how the high tone on *kuni* does not align with the right edge of the word; it is realised earlier than that. Apart from marking the question word with L*+H pitch accent, the entire question forms a prosodic phrase within the question IP.

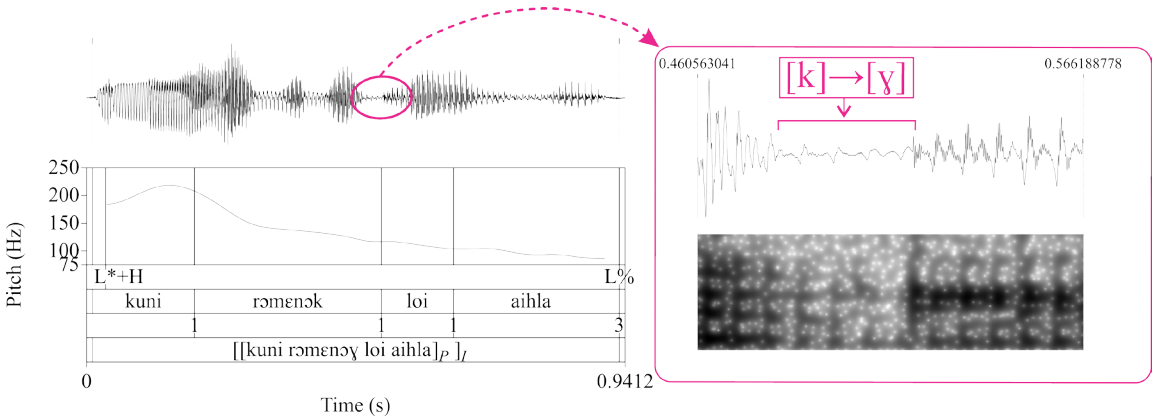


Figure 3-34 In the left panel, the pitch contour of the NVA *Wh*-question IP *kuni rɔmɛnɔk loi aihlak* 'Who did bring Ramen?' is displayed. The right panel zooms in the spectrogram demonstrating intervocalic [k] → [ɣ] lenition across word boundaries.

The right panel of Figure 3-34 demonstrates how intervocalic /k/ lenition is allowed across word boundaries within the P-phrase headed by L*+H pitch accent on *kuni*; this lenition is blocked elsewhere across P-phrase boundaries. In the declarative sentence (43), the same sequence of words *rɔmɛnɔk loi* does not initiate [k]→[ɣ] lenition as it is the case in (42).

	L*	H_P	L*	H_P	H*	L_I
43.	[[narajɔn-ɛ]$_P$		[rɔmɛn-ɔk]$_P$		[lo-i	aih-lak]$_P$]$_I$
	Narayan-NOM		Ramen-ACC		take-PRF	come-PST3

Narayan brought Ramen.

In (43), since *rɔmɛnɔk* and *loi* belong to different P-phrases, the intervocalic environment created in (42) for the word final /k/ of *rɔmɛnɔk* is not accommodated here. As a consequence, the said /k/ does not undergo lenition.

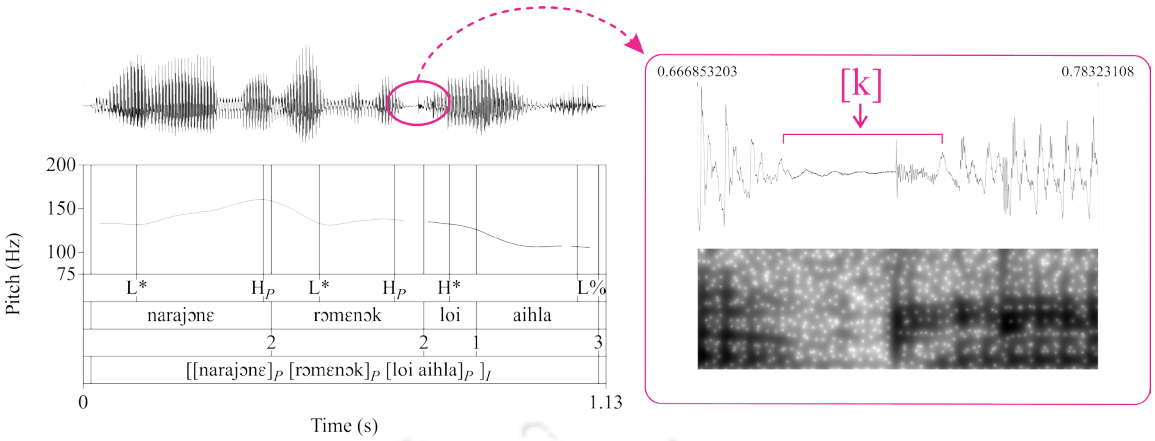


Figure 3-35 In the left panel, the pitch contour of the NVA declarative IP *narajɔnɛ rɔmɛnɔk loi aihlak* 'Narayan brought Ramen' is displayed. The right panel zooms in the spectrogram demonstrating how intervocalic [k] lenition is blocked across P-phrase boundaries.

In Figure 3-35, it has been demonstrated in the left panel how P-phrases *narajɔnɛ*, *rɔmɛnɔk* and *loi aihlak* are intonationally marked by L*H$_P$, L*H$_P$ and H*L$_I$ pitch patterns respectively. The right panel of Figure 3-35 illustrates with the help of zoomed-in spectrogram how /k/ lenition is not allowed across P-phrase boundaries.

Thus it is seen that in NVA *Wh*-questions, the question word together with the sequence of constituents following it forms a single P-phrase characterised by intonational as well as segmental cues. In case of SCA, on the other hand, the question word forms an independent P-phrase compelling the constituents following it to undergo complete pitch range compression (henceforth PRC). As claimed in §3.5.1.1.6 and §3.5.2.1.5, *Wh*-words in SCA and NVA question IPs behave similar to constituents with CF in the respective varieties.

3.6 Conclusion

In the present chapter, it has been demonstrated how post-lexical prosodic constituents are organised in SCA and NVA following a hierarchical order: IP > P-phrase > P-word. The chapter starts with a discussion on P-words that demonstrates that P-words lack intonational demarcation in both the varieties. The next section discusses how P-words are arranged into P-phrases, which besides being intonationally marked, form phonological domains. P-phrases are normally marked by pitch accents and boundary tones, and accommodate segmental processes within their domain. In the subsequent sections, intonational patterns of various sentence types have been discussed with reference to the

two varieties. SCA and NVA exhibit differences in the IP final pitch accent marking of declarative and Wh-question IPs. In the next chapter, it has been discussed how pitch accents and phrasing patterns discussed in this chapter may be influenced by CF.

Chapter 4 Contrastive focus phonology in SCA

4.1 Introduction

After a description of lexical prominence pattern and prosodic structure of post-lexical constituents in SCA and NVA in the previous chapters, this chapter discusses how contrastive focus (henceforth CF) is manifested in SCA. The chapter is divided into the following sections: §4.2 introduces us to the basic notion of CF, and how the concept of CF has been treated and defined so far, §4.3 explicates how a constituent with CF is highlighted in SCA at the prosodic level, §4.4 demonstrates the phonetic cues active in such highlighting. Finally in §4.4, the chapter ends with conclusive remarks on the CF manifestation in SCA.

4.2 Contrastive Focus

Contrastive focus (henceforth CF) has been described variously as identificational focus (Kiss, 1998), alternatives focus (Rooth, 1992) and contrastive focus (Selkirk, 2002; Zubizarreta, 1998; Kratzer, 2004). Although CF has been differentiated from the instances of focus created out of correction (Tomioka, 2009; Zimmermann & Onea, 2011), in this chapter both the types of foci will be treated synonymously as both of them generate a set of alternatives out of which the focused alternant receives contrastive focus (Rooth, 1992; Vallduvi & Vilkuna, 1998; Kiss, 1998). Contrastive (corrective) focus has been considered the strongest type of focus 'as the speaker asserts something which may contradict the expectations of the hearer' (Fery, 2013).

Rooth (1992) defines CF in terms of alternatives set; for her when a constituent receives CF it generates a set of alternatives which constitutes its focused meaning. This alternatives set includes the ordinary meaning of the focused constituent within its focused meaning. In (1) when *Ramen* is focused it creates an alternatives set of ordinary meanings: [Romen killed the cat, Ram killed the cat, Shyam killed the cat, etc.] of which the focused meaning is also a part. It is this alternatives set which differentiates a focused constituent from non-focused ones: constituents which are not focused do not generate alternatives set of meanings (Rooth, 1992; 1997).

1) A. Ram killed the cat.
   B. No, **Ramen** killed the cat.

According to Zubizarreta (1998), CF makes its realisation in relation to the context; it is the preceding statement which provides the context for CF. Zubizarreta talked about two-fold function of contrastive focus: apart from negating "the value assigned to a variable" in the preceding statement, contrastive focus provides an alternate value for the variable. In the following example, the context for contrastive focus is created by (2A), and (2B) which bears contrastive focus on *Red* performs two simultaneous functions: first it negates *John is wearing a blue shirt today* i.e. John is not wearing a blue shirt today, and second it induces an alternate value for the constituent which has been negated, here it is *Red* which is introduced in contrast to *blue* in the previous context statement: *John is wearing a red shirt today*.

2) A. John is wearing a blue shirt today.
   B. John is wearing a **red** shirt today (not a blue shirt).

From the cross-linguistic perspective it is apparent that while some languages employ phonological cues in order to mark focus, some others depend on phonetic correlates. Languages like English (Silverman & Pierrehumbert, 1990), German (Féry, 1993; Féry & Kügler, 2008), Dutch (Gussenhoven, 1983), Bengali (Hayes & Lahiri, 1991) and Korean (Jun & Lee, 1998) phonologically distinguish contrastive focus from broad or wide focus. In these languages CF is marked by either placing IP final pitch accent on the focused constituent or demarcating a prosodic boundary after or before the focus, or the both. For example, in English the tonal pattern of sentences change with focus change: the IP final pitch accent falls on the most prominent word or constituent within the IP and the post-focal constituents undergo deaccentuation. There are other languages like French (Féry, Hörnig, & Pahaut, 2010) and Bengali (Hayes & Lahiri, 1991) where focus exercises a demarcating function at the phrase boundary of the focused constituent. In Korean (Jun & Lee, 1998), focused constituents form single prosodic phrases together with the constituents following them.

Languages (as discussed above) employ pitch accents and phrasing in a phonologically significant way in order to highlight the focused status of a constituent. However, there are languages like Romanian (Manolescu, Olson, & Llebaria, 2009), Catalan (Borras-Comes, Vanrell, & Prieto, 2014), Spanish (Prieto, 2004) where greater pitch movement, longer duration and larger pitch range mark CF. These languages advocate for the inevitability of pitch range to be included in the phonological representation. In these languages, as has

been revealed by perception experiments, pitch range is employed in a categorically distinct manner in contradiction to the traditional view (Pierrehumbert, 1980; Beckman & Pierrehumbert, 1986a) which holds that pitch range is gradient and beyond the scope of phonology.

In this chapter, we see how SCA and NVA, in spite of being dialectal variants of the same Language, employ CF marking strategies that are phonologically different from each other. Both the varieties initiate P-phrase on the constituent with CF, though they maintain prosodic differences in their treatment of the sequence following the focused constituent. SCA shows an affinity to Kolkata Bengali (Hayes & Lahiri, 1991) in its demarcation of the focused constituent with a prosodic boundary tone, and NVA, similar to Bangladeshi Standard Bengali (henceforth BSB) (Khan, 2008; 2014) and Korean (Jun, 1993), forms a prosodic unit together with the post-focus constituents.

In SCA, a contrastively focused constituent receives IP nuclear accent on its first syllable which is followed by a high tone realised on its final syllable demarcating its right edge. The constituents following focus are restricted at the level of P-words, and as such they fail to get any tonal association (a P-word is not tonally specified unless it forms a P-phrase). On the other hand, the focus induced bitonal pitch accent on the focused constituent functions as the prosodic head for the entire string of P-words following it. The next section deals with the phonology CF in SCA, and explores various phonetics cues involved in highlighting an information which contrasts with something previously uttered in the context.

4.3 CF phonology in SCA

In SCA, constituents with CF initiate P-phrases, overriding default phrasing patterns. The resultant P-phrases are characterised by low pitch accent (L*) and high focus boundary tone (fH$_P$). Constituents succeeding such P-phrases lose their tonal variation which otherwise may be seen in WF condition. It is this effect which focus high tone (pitch accent/ boundary tone) wields on pitch and phrasing of post-focus constituents that motivated the postulation that focus high tones (fH$_P$) are phonologically different from other high tones (H$_P$). In order to mark this phonological distinction, ‘f’ diacritic has been used alongside focus high tone which has already been used in Khan (2008; 2014) for BSB.

It has been proposed in this chapter that when a constituent receives CF in SCA, it forms a P-phrase with L*fH$_P$ pitch contour; the pitch accent is associated with the first syllable assigning post-lexical prominence to the constituent, and the boundary tone gets associated with the final syllable demarcating the focus domain[30]. The post-focus string of constituents undergo compete pitch range compression (henceforth PRC), and as a consequence all the constituents experience tonal compromise at the post-lexical level. This compression is, however, free from post-focus dephrasing. Evidences in support of these claims will be provided in due course of the chapter.

4.3.1 Methodology

In order to see how CF interacts with prosody in SCA declarative sentences, we recorded single IP sentences of different lengths. The methodology involved here is correction of sentences. Data was collected in a dialogic format; speaker utters the WF variant of a sentence in response to the question *ki hol?* 'What happened?'. His/her rendering is followed by the same utterance said by the recordist as a question with a difference of one constituent, which s/he needs to correct by uttering the previously uttered sentence once again. His/her second rendering bears CF on the corrected word. A randomly selected example has been demonstrated below which only explains the schema of data collection. In the illustration below the speaker first produces *rɔmɛnɛ dɔrzar sabipat millɔnɔk dilɛ* 'Ramen gave the door key to Milan' in WF condition as a response to the question *ki hol?* When the listener reproduces the same sentence with a question intonation and by replacing *dɔrza-r* 'door-GEN' by *k^{h}iriki-r* 'window-GEN, the speaker clarifies the mistake by re-uttering the sentence with CF on *dɔrzar*.

Question:	ki	ho-l			
	what	happen-PST3			
	What did happen?				
Speaker:	rɔmɛn-ɛ	dɔrza-r	sabi-pat	milɔn-ɔk	di-l-ɛ
	Ramen-NOM	door-GEN	key-CLS	Milan-ACC	give-PST-3
	Ramen gave the door key to Milan.				

[30] Exceptions will be reported in case of monosyllabic focused constituents, where both pitch accent and boundary tone associate with the same syllable but their phonetic alignment is moraic.

Question:	rɔmɛn-ɛ	*k^{h}iriki-r*	sabi-pat	milɔn-ɔk	di-lɛ ?
	Ramen-NOM	window-GEN	key-CLS	Milan-ACC	give-PST3
	Did Ramen give window key to Milan?				
Speaker:	nai nai	rɔmɛn-ɛ	**dɔrza-r**	sabi-pat	milɔn-ɔk	di-l-ɛ
	No no	Ramen-NOM	**door-GEN**	key-CLS	Milan-ACC	give-PST-3
	No no, Ramen gave the **door** key to Milan.				

A total number of 46 (forty-six) sentences of varying length constituted the core WF data corpus for the present paper. Following the above illustrated dialogic format and depending upon the length, each sentence generates as many CF utterances as there are words; for instance, if a sentence contains four words/phrases, it generates at least four variants with CF on different words/phrases in each of the variants. As against the WF variant of *rɔmɛnɛ dɔrzar sabipat millɔnɔk dilɛ*, we get five other CF variants of the utterance with CF on *rɔmɛnɛ*, *dɔrzar*, *sabipat*, *dɔrzar sabipat*, *millɔnɔk* and *dilɛ*.

4.3.1.1 Subjects and recording setting

For the data, 3 (three) male and 2 (two) female speakers (20 to 30 years old) from Sivasagar District of Assam were recorded in the recording booth of Phonetics and Phonology Lab, Indian Institute of Technology Guwahati. The recording was done using a Tascam, D-100 PCM recorder in wav format at the sampling rate of 44 KHz with 16bit resolution with the help of a Shure SM10A head-worn microphone. Care was taken so that the recorded utterances were produced at a normal speech rate.

4.3.1.2 Data analysis

The collected data was segmented following ToBI conventions (Beckman & Elam, 1997). The sound files were annotated in 4-tier (four-tier) TextGrid files in PRAAT (Boersma & Weenink, 2016). The first tier is the Tone tier containing information regarding tonal alignment and tone levels, the second tier contains orthogonal representation of the sentences recorded. In the third tier, which is the break index tier, word and phrase level boundaries are demarcated where 1, 2 and 3 refer to P-word, P-phrase and IP boundary respectively. In the lowest tier (miscellaneous) comments are given regarding any disjuncture marked in the above three tiers.

4.3.1.3 Interpretation of the data

In the paper, our claims regarding CF manifestation do not rely merely upon the trends of intonational contours, we have further considered various phonological processes which are blocked across prosodic boundaries. These phonological processes include phrase internal /r/ deletion and intervocalic spirantisation which will be discussed shortly. Before going into these processes defining the phonological domains initiated by CF, the various contours generated by CF are discussed below.

4.3.2 CF rise (L* fH$_P$ / L*+H fH$_P$)

When a constituent that contains more than one syllable receives CF, it is marked by a rising pitch contour and forms the right most P-phrase in the IP bearing the IP final pitch accent (Twaha & Mahanta, 2016). A single worded focus domain is demarcated by a low pitch accent and a high focus boundary tone, whereas in case of a longer string (containing more than one word), low pitch accent may be replaced by a bitonal one. After the pitch accent is realised on the focused constituent, all the following constituents, if there are any, are restricted at the level of pitch accent and boundary tone realisation. Here we can consider the same sentence given in (3) but produced with CF on *sabi-pat* 'key-DET', *dɔrzar* 'door-GEN' and *dɔrzar sabipat* 'the door key' as given in (4), (5) and (6) respectively.

	L*	H$_P$	L*+H		H$_P$	L*	H$_P$	L$_I$
3)	[[rɔmɛn-ɛ]$_P$		[dɔrza-r		sabi-pat]$_P$	[milɔn-ɔk]$_P$		[dilɛ]$_P$]$_I$

In SCA declarative utterances, each non-final P-phrase is characterized by low starred tone (L*) and high boundary tone (H$_P$): L* is realised on the first syllable and H$_P$ on the final syllable of P-phrases (see chapter 3 for details). The pitch contour of utterance (3), given in Figure 4-1, shows how the IP is characterised by a sequence of LH melodies where each P-phrase displays a rising pitch pattern with L* aligned with the first mora of the first syllable and H$_P$ with that of the last syllable of the P-phrase.

For instance, *rɔmɛnɛ* as a P-phrase bears the pitch accent L* on the first syllable *rɔ* and the boundary tone H$_P$ on the final syllable *nɛ*. In case of *dɔrzar sabipat*, the starred tone L* aligns with the first mora of the syllable *dɔr* and the boundary tone with the the first mora of the concluding syllable *pat*. While in *rɔmɛnɛ* the high boundary tone is realised adjacent to the prosodic boundary, in *dɔrzar sabipat*, the boundary tone is realised

little early since the first mora of the last syllable is assigned to the vowel of *pat*; same is true for *milɔnɔk*, where we can see an advanced realisation of the high boundary tone H_P.

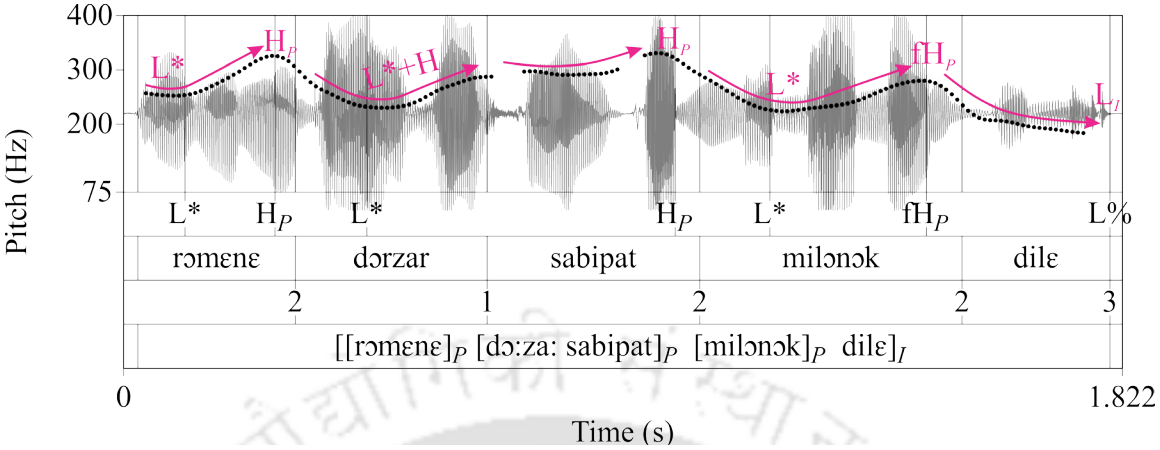


Figure 4-1 WF rendering of the sentence *rɔmɛnɛ dɔrzar sabipat milɔnɔk dilɛ* 'Ramen gave the door key to Milan' demonstrates rising contours on non-final P-phrases.

In SCA declarative IPs, the right most P-phrase (immediately preceding the final constituent) bears the IP final accent of the IP. In (3), *milɔnɔk* receives the accent marked by L*H_P pitch contour. P-phrases in an all new declarative IP always maintain a downstepped order where each P-phrase is manifested with a lower pitch rise than the preceding rise. As a consequence, although *milɔnɔk* is phonologically equivalent to all the P-phrases preceding it, its realisation is downstepped in comparison with the preceding rises.

When a particular constituent in an IP receives CF, it is characterised by IP final pitch accent and focus high boundary tone (fH_P). For instance, in (4), the focused word *sabipat* forms a P-phrase overriding the default phrasing *dɔrzar sabipat* seen in (3). It becomes all the more apparent when we compare Figure 4-2 with Figure 4-1. The focused word bears the final pitch accent (L*) of the IP on its first syllable, and is demarcated by focus high boundary tone (fH_P) on the last syllable. The P-phrase high boundary tone (H_P) seen on the last syllable of *milɔnɔk* in Figure 4-1 is not realised in Figure 4-2. Since in (4) *milɔnɔk* occurs in a post-focus environment, it experiences complete PRC, and as such its pitch accent and boundary tone are not realised (see §4.3.5 for detail on post-focus PRC).

	L* H_P	L* H_P	L* fH$_P$	L_I
4)	[[rɔmɛnɛ]$_P$	[dɔrza-r]$_P$	[**sabi-pat**]$_P$	[milɔnɔk]$_P$ [dilɛ]$_P$]$_I$

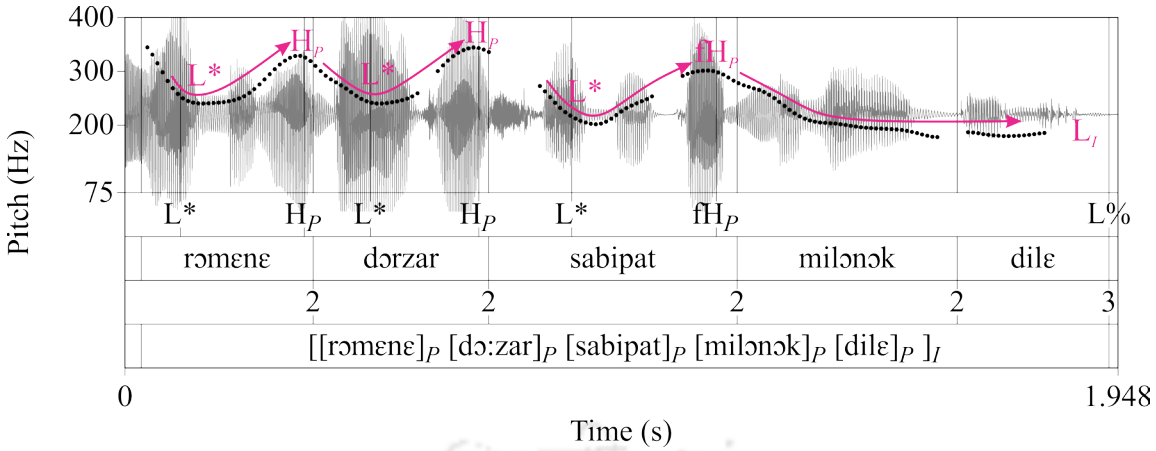


Figure 4-2 Here the sentence *rɔmɛnɛ dɔrzar sabipat milɔnɔk dilɛ* 'Ramen gave the door key to Milan' is uttered with CF on *sabipat*.

Now let us consider another rendering of sentence (3) where CF is laid on *dɔrzar*, as it is the case in (5).

	L* H$_P$	L* fH$_P$			L$_I$
5)	[[rɔmɛnɛ]$_P$	[**dɔrza-r**]$_P$	[sabi-pat]$_P$	[milɔnɔk]$_P$	[dilɛ]$_P$]$_I$

The focused word forms a P-phrase with L*fH$_P$ pitch contour, while in WF context (3), the same word forms a P-phrase together with *sabipat* parallel to a Noun Phrase at the syntactic level. Succeeding the focus, all potential P-phrases (which are otherwise realised in WF condition (3)) lose their intonational specifications; this results in an interpolation between the focus high boundary tone and low IP boundary tone. The proposal here is that although the post-focus constituents lose their intonational specifications, their phrasing pattern at the prosodic level may remain unchanged. The existence of these domains are supported by different segmental processes[31], which are accommodated and blocked within and across such domains respectively.

[31] Segmental processes supporting phonological domains have been discussed in §4.3.4.

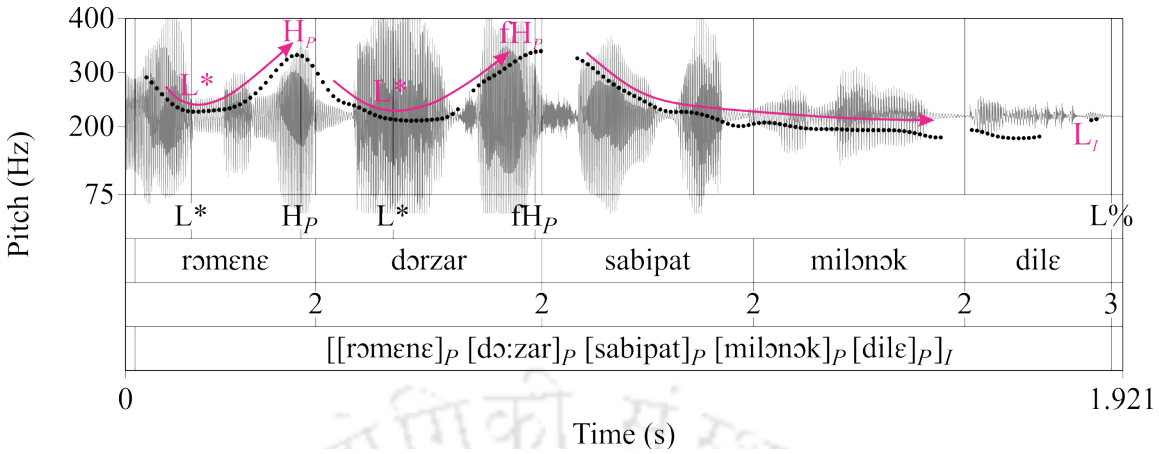


Figure 4-3 Here the sentence *rɔmɛnɛ dɔrzar sabipat milɔnɔk dilɛ* 'Ramen gave the door key to Milan' is uttered with CF on *dɔrzar*.

The CF pitch pattern L*fH$_P$ proposed and illustrated so far in the foregoing examples is evident even when the final constituent, which does not normally attract pitch accent, receives CF. As in such occasions, the right edge of the focused constituent coincides with IP right edge, the final syllable of the constituent aligns with two prosodic boundaries, each one designated by a boundary tone: CF induced P-phrases have focus high boundary tone (fH$_P$), and IPs have default low boundary tone (L$_I$). Both the boundary tones are realised on the final syllable of the focused constituent. In (6), the final P-word *dilɛ*, being focused, bears the final pitch accent of the IP on its first syllable, and its final syllable gets associated with fH$_P$ and L$_I$ simultaneously.

L* fH$_P$ L$_I$

6) [[rɔmɛnɛ]$_P$ [dɔrza-r sabipat]$_P$ [milɔnɔk]$_P$ [**dilɛ**]$_P$]$_I$

As can be seen in Figure 4-4, immediately after fH$_P$ makes its realisation on *lɛ* of *dilɛ*, the *F$_0$* contour undergoes a steep fall within the same syllable due to the low IP boundary tone (L$_I$). The rise-fall on the final syllable of the focused constituent occurring IP finally can be served as an evidence in support of the assumption in the present work that IP final focused constituents right align with two prosodic boundaries: P-phrase and IP boundary.

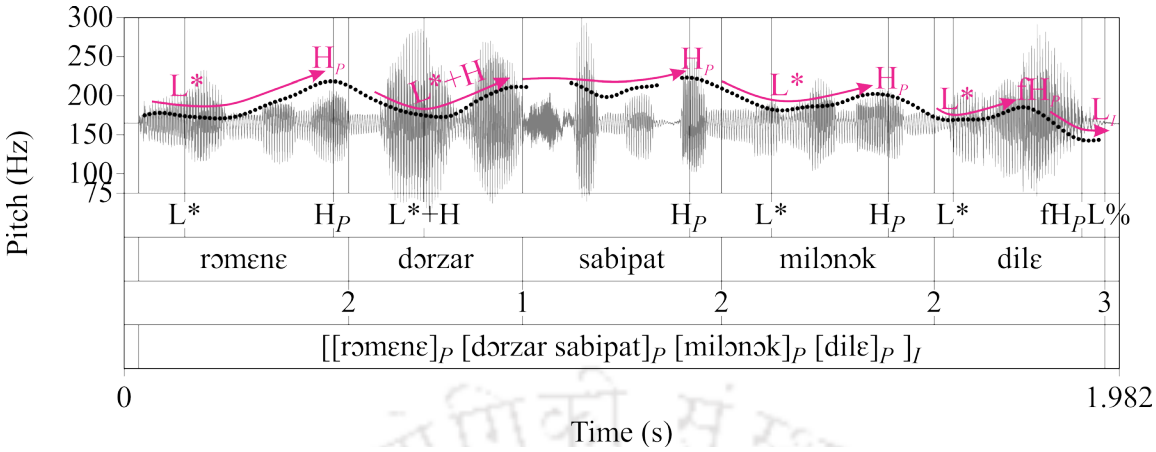


Figure 4-4 F_0 contour of the sentence *rɔmɛnɛ dɔrzar sabipat milɔnɔk dilɛ* 'Ramen gave the door key to Milan' uttered with CF on *dilɛ*.

However, with longer strings of focused constituents the smooth rise pattern of L*fH$_P$ may not precisely represent the CF pitch contour. The pitch movement from the initial low to realised on the first syllable to the constituent final high is not smooth enough to be designated by L*fH$_P$ focus contour.

In sentence (7), the non-finite phrase *kɔmɔla k^{h}aboloi* 'to eat oranges' is in focus and as a result the two P-words *kɔmɔla* and *k^{h}aboloi* form a composite P-phrase. The pitch accent is realised on the first syllable *kɔ* of *kɔmɔla*.

	L*	H$_P$	L*+H	fH$_P$			L$_I$
7)	[[mad^{h}ɔb]$_P$	[**kɔmɔla**	**k^{h}a-bo-loi**]$_P$	[k^{h}ɔgɛn-ɔr	g^{h}ɔr-ɔloi]$_P$	[go-isɛ]$_P$]$_I$	
	Madhab	orange	eat-FUT-DAT	Khagen-GEN	house-DAT	go-PST3	

Madhab went to Khagen's house to eat oranges.

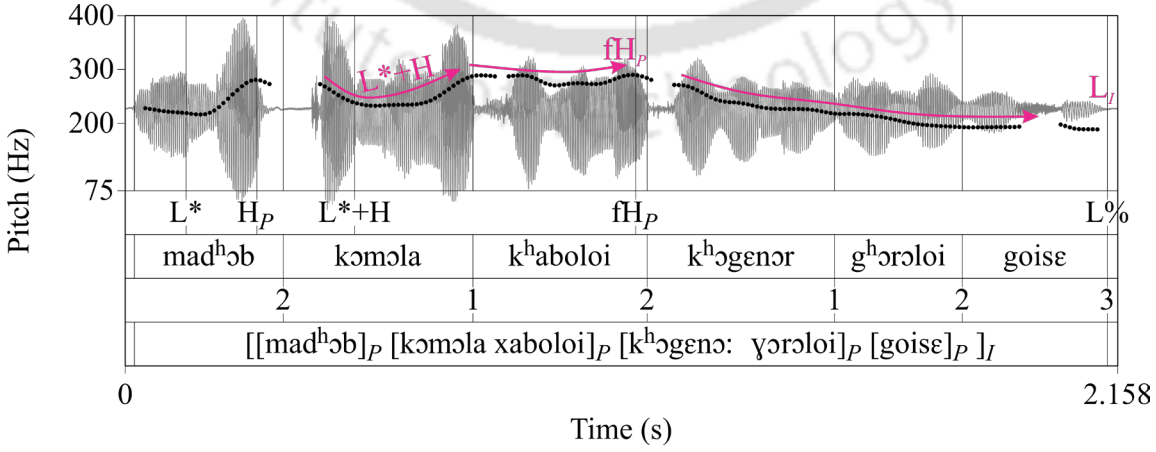


Figure 4-5 Here the sentence *mad^{h}ɔb* ***kɔmɔla k^{h}aboloi*** *k^{h}ɔgɛnɔr g^{h}ɔrɔloi goisɛ* 'Madhab went to Khagen's house to eat oranges' is uttered with CF on *kɔmɔla k^{h}aboloi*.

As seen in Figure 4-5, after a swift rise on the second and third syllable, the F_0 track maintains a plateau until the final syllable *loi* of *kʰaboloi* where the focus domain is demarcated by a focus high boundary tone fH$_P$. The high tone aligns with the first mora of the last syllable *loi*. In such cases, where focus is on a longer sequence, CF smooth rise (L*fH$_P$) may be realized as L*+H fH$_P$. The pitch accent and boundary tone of the post-focus constituent *kʰɔgɛnɔr gʰɔrɔloi* remain unrealised due to PRC (see Figure 4-11 for the WF manifestation of (7)).

It has been reported above, how in focused constituents, pitch accents and boundary tones phonologically associate with the left-most prominent, and the final syllable respectively; however, phonetically these tonal targets align with the first mora of prominent and final syllables respectively. This specification of alignment does not always hold true, especially when focused constituents are monosyllabic. In such cases, both the post-lexical tones (L* and fH$_P$) have only one syllable to get associated with. Here, the two tones phonetically align with the two morae of monosyllabic focused constituents. Since Assamese is a quantity sensitive language and obeys foot binarity, monosyllabic P-words must minimally contain two morae (see §2.2.3 for details). CF induced tones (L* and fH$_P$) are assigned to these two morae from left to right. Evidence in support of this claim has been provided below with reference to examples taken from SCA.

	L* H$_P$	L* H$_P$	L* H$_P$	L$_I$
8)	[[ram-ɛ]$_P$	[bɔga mɔm]$_P$	[kin-ibo-loi]$_P$	[go-isɛ]$_P$]$_I$
	Ram-NOM	white candle	buy-FUT-DAT	go-PST3
	Ram went to buy a white candle.			

In IP (8), which is uttered in WF context, the P-words *bɔga* and *mɔm* constitute a prosodic phrase designated by L*H$_P$ pitch contour.

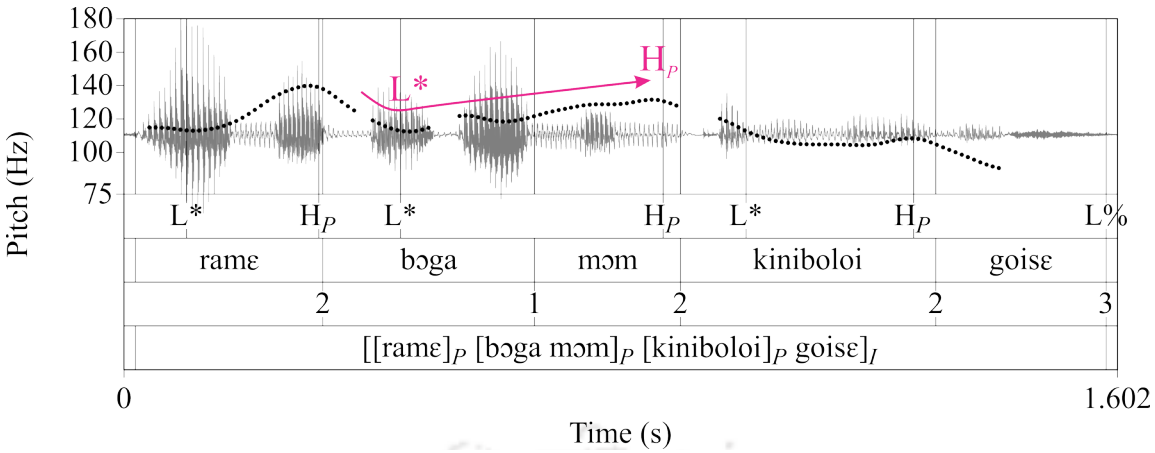


Figure 4-6 In the IP *ramɛ bɔga mɔm kiniboloi goisɛ* 'Ram went to buy a white candle', the three P-phrases show rising contours with L*H$_P$ pitch pattern.

In Figure 4-6, the second P-phrase *bɔga mɔm* demonstrates a rising contour since it is designated by L*H$_P$ pitch contour: L* aligns with vowel of the first syllable and H$_P$ with that of the final syllable. When the same sentence is uttered with CF on the monosyllabic word *mɔm* 'candle', the alignment of tones give us a different picture.

	L* H$_P$	L*H$_P$	L*fH$_P$		L$_I$
9)	[[ram-ɛ]$_P$	[bɔga]$_P$	[mɔm]$_P$	[kin-ibo-loi]$_P$	[go-isɛ]$_P$]$_I$
	Ram-NOM	white	candle	buy-FUT-DAT	go-PST3
	Ram went to buy a white candle.				

In (9), *mɔm* is characterised by L*fH$_P$ pitch pattern since the word receives CF; as such it forms a separate P-phrase away from *bɔga*.

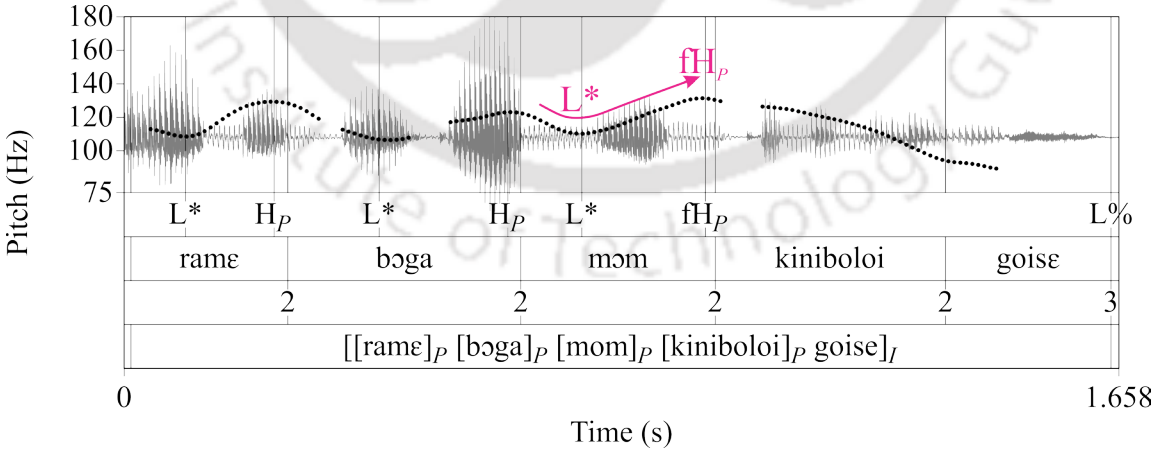


Figure 4-7 In the IP *ramɛ bɔga mɔm kiniboloi goisɛ* 'Ram went to buy a white candle' uttered with CF on *mɔm*, a rising contour is seen on the focused word.

Figure 4-7 demonstrates how monosyllabic *mɔm* demonstrates rising contour and justifies the tonal specification for the constituent given in (9). Though L* and H$_P$ are associated

with the same syllable, they align with the two morae of the syllable. Since /ɔ/ and /m/ are assigned two morae, they bear L* and H_P respectively. This trend reveals that SCA prefers *compression* over *truncation* as far as handling of phonetic pressure is concerned. Languages or language varieties adopting compression strategy do not compromise the tonal contour assigned to a particular syllable, the entire tonal contour is manifested on the syllable by speeding up the pitch realisation. On the other hand, truncating languages or varieties instead of going for temporal reorganization of the pitch contour, partially manifest it (Grønnum, 1991; Grabe, Post, Nolan, & Farrar, 2000; Hayes & Lahiri, 1991; Prieto & Ortega-Llebaria, 2009). According to Ladd (1991), compression and truncation are two phonetic realisation strategies, which are *most conspicuous in nuclear accents* and which do not influence the inventory of phonological contrasts.

4.3.3 Pre-focus constituent

Besides initiating P-phrases on focused constituents, CF exercises an optional phrasing effect on pre-focus constituents, especially with shorter strings of utterances. With longer strings of utterances, pre-focus phrasing may not seem to hold good. The WF utterance in (10) is produced with three P-phrases: *rɔmɛnɛ*, *k^hɔgɛnɔk* and *matiboloi* (each denominated by rising contour) where *matiboloi* bears the IP final pitch accent.

	L* H_P	L* H_P	L* H_P	L_I	
10)	[[rɔmɛn-ɛ]$_P$	[k^hɔgɛn-ɔk]$_P$	[mat-ibo-loi]$_P$	[gɔ-isɛ]$_P$]$_I$	←**WF**
	Ramen-NOM	Khagen-ACC	call-FUT-DAT	go-PST3	
	Ramen went to call Khagen.				

In (10), the non-final P-phrases are designated by L*H_P pitch contour. The intonational contour materialising the tonal specifications have been displayed in Figure 4-8.

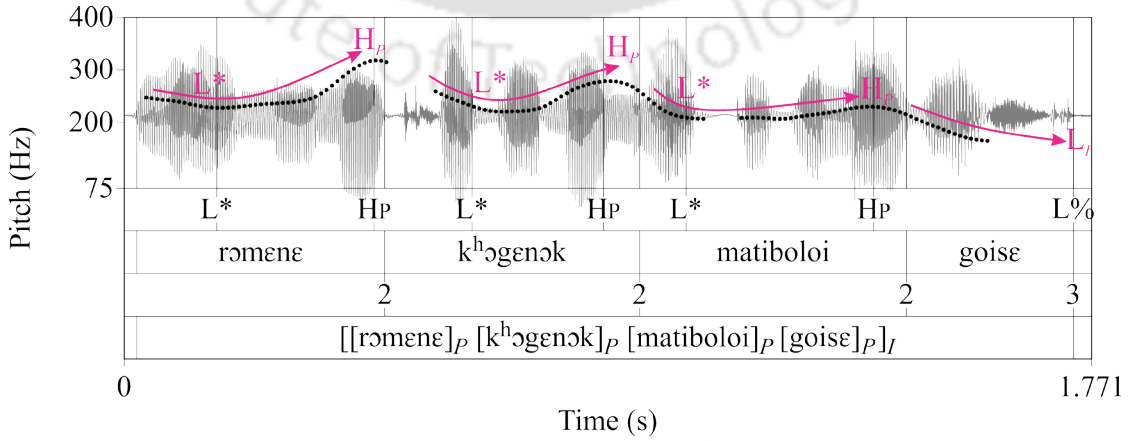


Figure 4-8 The WF rendering of the sentence *rɔmɛnɛ k^hɔgɛnɔk matiboloi gɔisɛ* (Ramen went to call Khagen)

In the P-phrases displayed in Figure 4-8, L* aligns initially and H_P is on the final syllable of the P-phrase lending a rising contour to the F_0 curve, which interpolates between them. In the first phrase, the final syllable being monomoraic, H_P is realised adjacent to the boundary of the prosodic phrase. In the second and the third P-phrase, as the final syllables are bimoraic, the phrase final high tone is realised earlier than the prosodic boundary.

When sentence (8) is produced with CF on *matiboloi*, as is the case in (11), the pre-focus constituents behave as a single prosodic unit characterised by bitonal pitch accent L*+H and high boundary tone H_P (Figure 4-9).

	L*+H	H_P	L* fH$_P$	L_I
11)	[[rɔmɛn-ɛ	k^{h}ɔgɛn-ɔk]$_P$ [x]	[**mat-ibo-loi**]$_{CF}$	[gɔ-isɛ]$_P$]$_I$
	Ramen-NOM	Khagen-ACC	**call-FUT-DAT**	go-PST3
	Ramen went to call Khagen.			

The intonationally marked pre-focus P-phrase displayed in Figure 4-9 phrases all the pre-focus constituents together. It derives endorsement in support of its status as a prosodic domain from the occurrence of intervocalic spirantisation within its domain across P-word boundaries. The word initial [k^h] in *k^{h}ɔgɛnɔk* is produced as its fricativised version [x] (displayed in the fourth tier of Figure 4-9). This segmental process of assimilation is blocked in (10) as *rɔmɛnɛ* and *k^{h}ɔgenɔk* belong to two different prosodic domains.

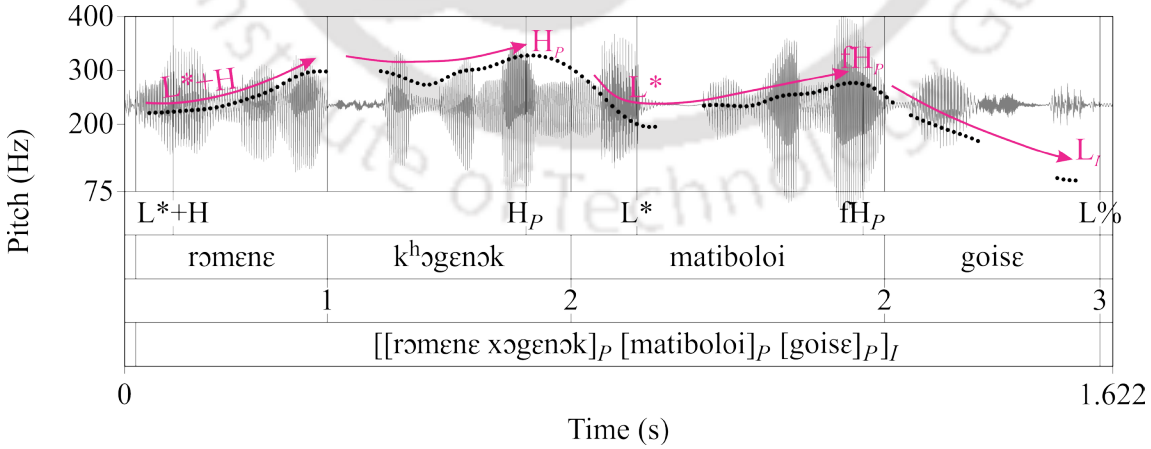


Figure 4-9 Annotated contour of the sentence *rɔmɛnɛ k^{h}ɔgɛnɔk matiboloi gɔisɛ* (Ramen went to call Khagen) uttered with CF on *matiboloi*.

Although phrasing of the pre-focus constituents is easily observable in the examples discussed above, in longer pre-focus strings this phrasing pattern may not be maintained. For instance, in (12), where CF is on the penultimate constituent *milɔnɔk* 'Milan-OBJ', the pre-focus constituents are not included within a single prosodic domain: *rɔmɛnɛ* 'Ramen-SUB' and *dɔrzar sabipat* 'the door key' constitute two separate P-phrases.

	L* H_P	L*	H_P	L* fH_P	L_I
12)	[[rɔmɛn-ɛ]$_P$	[dɔrza-r]$_P$	[sabi-pat]$_P$	[**milɔn-ɔk**]$_P$	[di-lɛ]$_P$]$_I$
	Ramen-NOM	door-GEN	key-CLS	**Milan-ACC**	give-PST3
	Ramen gave the door-key to Milan.				

The prosodic phrasing of the pre-focus constituents can be traced by looking at the intonational contour of the utterance given in Figure 4-10.

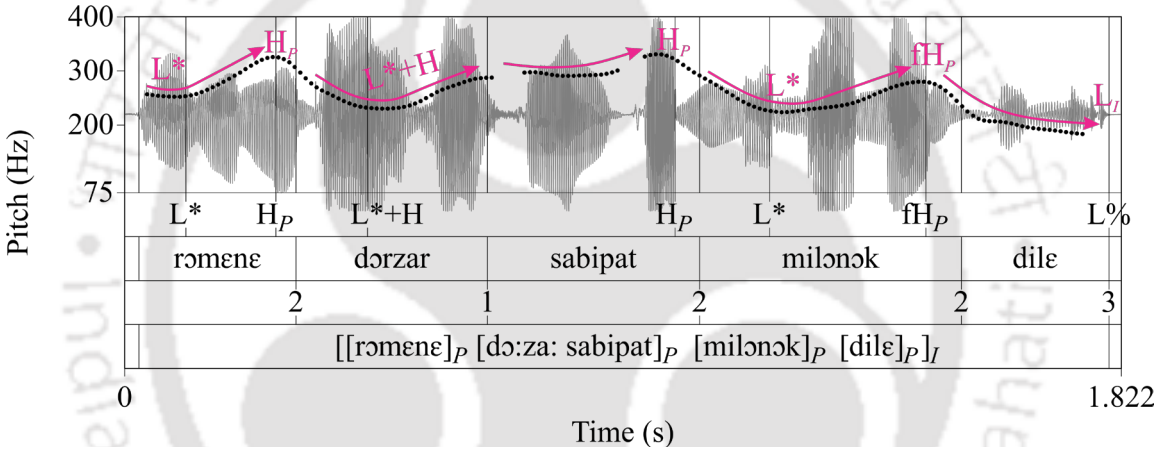


Figure 4-10 In the utterance *rɔmɛnɛ dɔrzar sabipat milɔnɔk dilɛ* 'Ramen gave the door key to Milan' produced with CF on *milɔnɔk*, the pre-focused constituents (*rɔmɛnɛ* and *dɔrzar sabipat*) do not form a composite prosodic phrase.

The pre-focus sequence in IP (12): *rɔmɛnɛ dɔrzar sabipat* is split into two prosodic phrases instead of forming a single prosodic domain. The two P-phrases *rɔmɛnɛ* and *dɔrzar sabipat* are designated by rising contours with L*H_P tonal specifications. Thus it can be assumed that pre-focal prosodic phrasing is not obligatorily observed in SCA.

4.3.4 Post-focus pitch compression

Cross-linguistically, post-focus pitch range compression (PRC) is a common phenomenon which has been reported in many languages like Bengali (Hayes & Lahiri, 1991; Khan, 2008), Hindi (Patil, et al., 2008), Tamil (Keane, The Intonational phonology of Tamil, 2014), French (Jun & Fougeron, 2000), Korean (Jun & Lee, 1998) and so on. SCA

maintains complete PRC following constituents bearing CF. In SCA, CF constituents are never followed by another pitch accent in the same IP. In the present work, it has been assumed and later supported by a phonetic experiment (reported in §4.4) that in SCA post-focus sequence, the P-phrase boundaries across constituents do not necessarily get deleted. It is only at the level of intonational representation that the sequence always undergoes compromise, the prosodic phrasing within the sequence may remain intact. Following the realisation of focus high boundary tone fH_P, all the pitch accents and boundary tones in the post-focus string undergo complete PRC. As such, the P-phrases in the post-focus string remain tonally compromised. The motivation in support of the claim that the prosodic phrasing within the sequence may remain unchanged can be drawn from various segmental processes (see chapter 3), which are allowed and blocked within and beyond boundaries of P-phrases respectively.

Supporting the claim in favour of post-focus PRC, the IPs given in (13) and (14) may be considered.

	L* H_P	L*	H_P	L*	H_P	L_I
13)	[[mad^{h}ɔb]$_P$	[kɔmɔla	k^{h}a-bo-loi]$_P$	[k^{h}ɔgɛn-ɔr	g^{h}ɔr-ɔloi]$_P$	[go-is-ɛ]$_P$]$_I$
			[x]	[k^h]	[ɔ] [ɣ]	
	Madhab	oranges	eat-FUT-DAT	Khagen-GEN	house-DAT	go-PST-3

Madhab went to Khagen's house to eat oranges

The IP given in (13) represents the utterance produced in WF context exhibiting L*H_P pitch configuration on non-final P-phrases. As shown in (13), segmental processes such as /r/ deletion and stop spirantisation ([g^h] → [ɣ]) are allowed within P-phrase domain and obstructed across it.

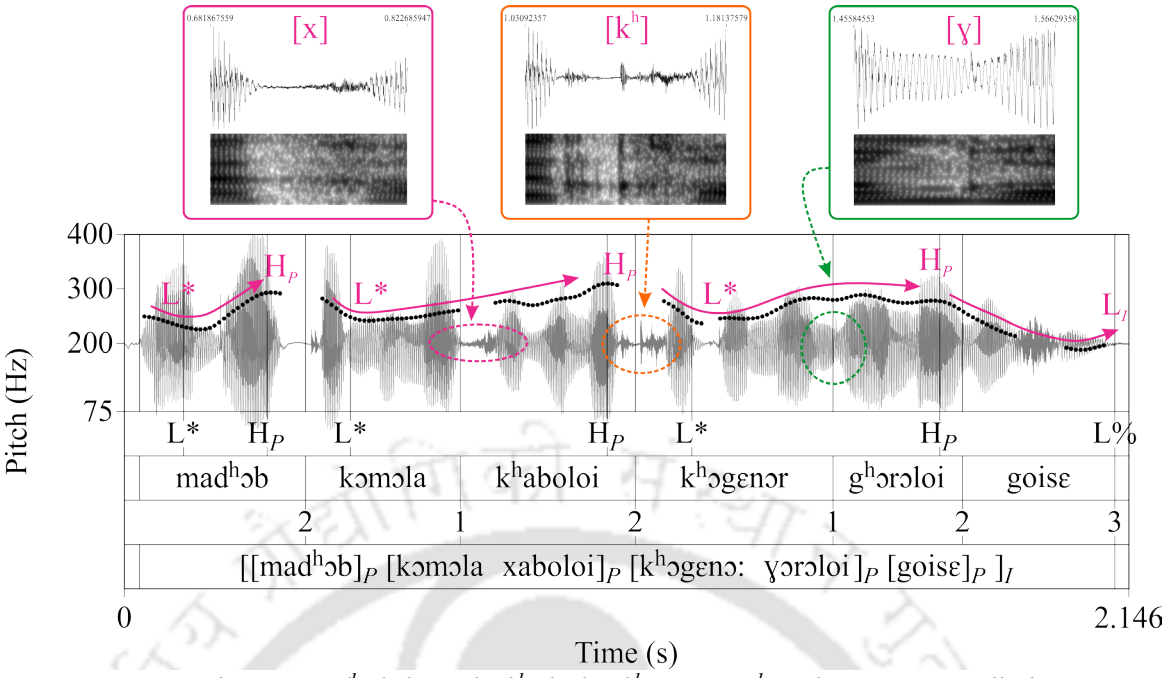


Figure 4-11 In the IP *madʰɔb kɔmɔla kʰaboloi kʰɔgɛnɔr gʰɔrɔloi goisɛ* 'Madhab went to Khagen's house to eat oranges' [kʰ] and [gʰ] spirantisation, and /r/ deletion are accommodated P-phrase internally. [kʰ] of *kʰɔgɛnɔr* does not undergo assimilation since it aligns with P-phrase boundary.

In Figure 4-11, it has been demonstrated how P-phrase internally the segmental process of intervocalic [kʰ] and [gʰ] fricativisation is accommodated. Word initial [kʰ] of *kʰaboloi* and [gʰ] of *gʰɔrɔloi* spirantise to [x] and [ɣ] respectively since the two words constitute P-phrases together with their preceding words. On the other hand, [kʰ] of *kʰɔgɛnɔr* does not experience such a change although the word is preceded by a word that ends with a vowel (*kʰaboloi*). This shows that *kɔmɔla kʰaboloi* and *kʰɔgɛnɔr gʰɔrɔloi* constitute two separate prosodic domains since spirantisation is permitted within the domain but blocked across it.

If CF renderings of the utterance given in (13) are considered, it will be seen that focus, apart from initiating prosodic phrase out of focused constituents, induces complete PRC on the following P-phrases. The IP in (14) bears CF on *kʰa-bo-loi* 'eat-FUT-DAT', and as an outcome, the constituent forms a P-pharse breaking away from the default phrasing with *kɔmɔla* in WF condition.

	L* H_P	L* H_P	L* fH_P				L_I
14)	[[madʰɔb]_P	[kɔmɔla]_P	**[kʰa-bo-loi**]_P	[kʰɔgɛn-ɔr	gʰɔr-ɔloi]_P	[go-is-ɛ]_P]_I
			[kʰ]	[kʰ] [ɔ]	[ɣ]		

This focus induced phrasing on *kɔmɔla* in (14) can be cued from the blocking of [k^h] spirantisation, which is allowed in (13). In the post-focus sequence, on the other hand, accommodation and blocking of spirantisation follow the trend demonstrated in (13): [g^h] of *g^{h}ɔrɔloi* sprirantise to [ɣ], but [k^h] of *k^{h}ɔgɛnɔr* does not change.

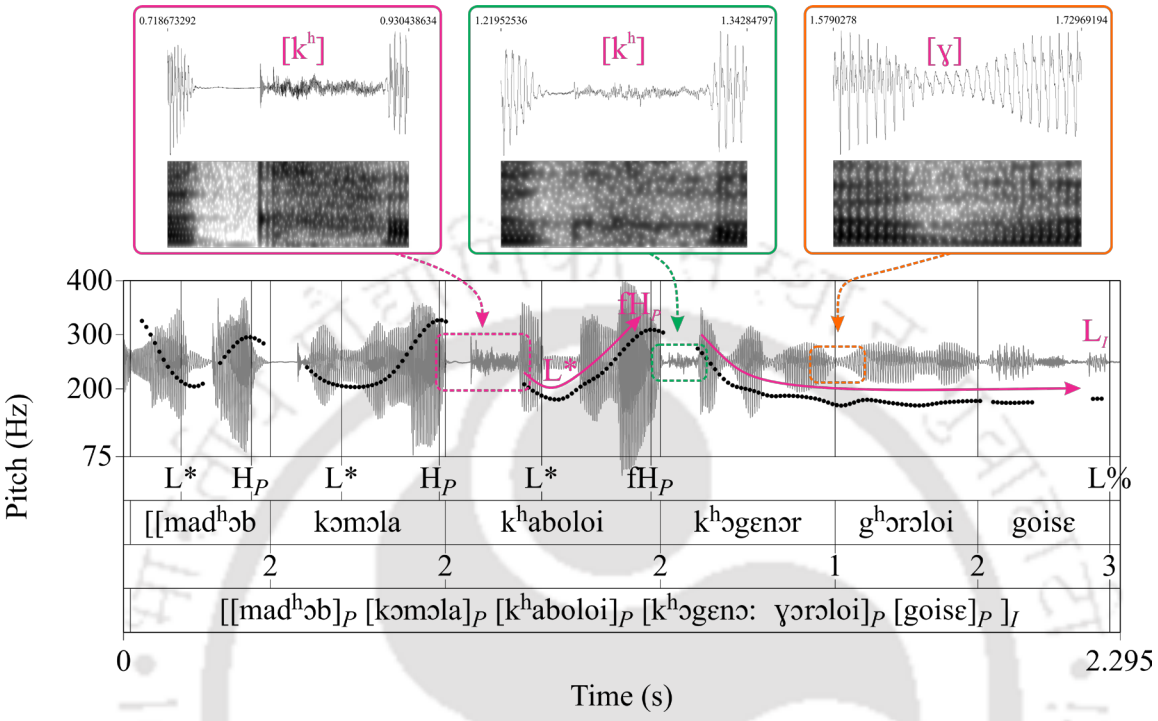


Figure 4-12 In the IP *mad^{h}ɔb kɔmɔla k^{h}aboloi k^{h}ɔgɛnɔr g^{h}ɔrɔloi goisɛ* 'Madhab went to Khagen's house to eat oranges' with CF on *k^{h}aboloi*, [k^h] of *k^{h}aboloi* does not spirantise due to its phrase initial occurrence. *k^{h}ɔgɛnɔr g^{h}ɔrɔloi* maintains its prosodic phrasing by retaining its phrase initial [k^h].

As demonstrated in Figure 4-12, although *k^{h}ɔgɛnɔr g^{h}ɔrɔloi* occurs in post-focus environment and does away with pitch accents and boundary tones, it does not compromise its phrasal status; as such it continues to be a phonological domain accommodating [g^h] to [ɣ] spirantisation. The existence of [k^h] at the initial position of *k^{h}ɔgɛnɔr g^{h}ɔrɔloi* testifies that the sequence does not dephrase into the focused initiated P-phrase. Now, if IP (15) is considered which bears CF on the IP initial constituent *mad^{h}ɔbɛ*, the existence of phrase level prosodic boundaries becomes all the more clear.

15)
L* fH$_P$ L$_I$
[[**mad^{h}ɔb**]$_P$ [kɔmɔla k^{h}a-bo-loi]$_P$ [k^{h}ɔgɛn-ɔr g^{h}ɔr-ɔloi]$_P$ [go-is-ɛ]$_P$]$_I$
[k^h] [k^h] [ɔ] [ɣ]

Since the subject *mad^{h}ɔb* receives CF, it constitutes a P-phrase and bears the IP final pitch accent. As such, all the pitch accents and boundary tones (excluding L$_I$), which are realised

on the following constituents in the WF rendering (see (13)), experience complete PRC in the post-focal environment (15). This post-focal compromise, as stated above, takes place mainly at the intonational level since the phrasing pattern in the sequence may or may not undergo any change.

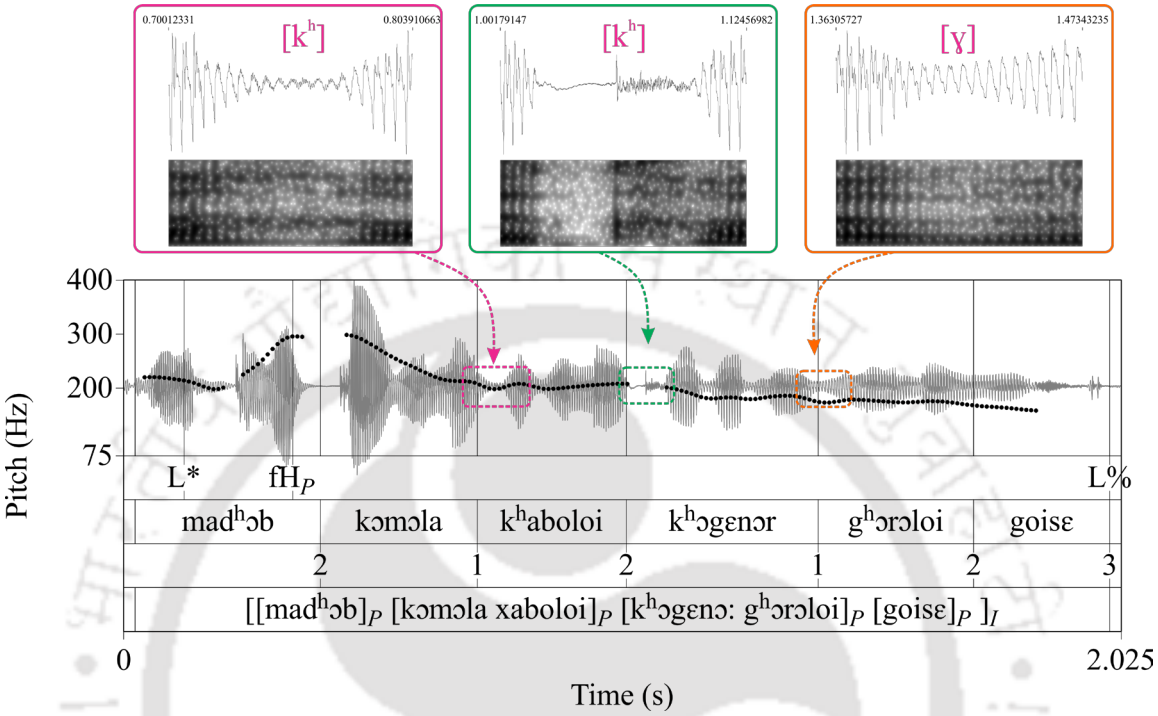


Figure 4-13 the IP *madʰɔb kɔmɔla kʰaboloi kʰɔgɛnɔr gʰɔrɔloi goisɛ* 'Madhab went to Khagen's house to eat oranges' produced with CF on *madʰɔbɛ* induces PRC on the post-focus sequence without dephrasing the P-phrases *kɔmɔla kʰaboloi* and *kʰɔgɛnɔr gʰɔrɔloi.*

In Figure 4-13, it has been demonstrated how post-focus P-phrases, in spite of losing their tonal specifications, strongly retain their prosodic boundaries not to accommodate phonological processes like intervocalic spirantisation: [kʰ] in *kʰɔgɛnɔr* does not undergo assimilation due to the P-phrase boundary (designated by 2 in the third tier of Figure 4-13) preceding it. However, phrase internally such processes are accommodated: [kʰ] becomes [x] in *kʰaboloi* and [gʰ] becomes [ɣ] in *gʰɔrɔloi.*

4.3.5 Summary

The intonational patterns for CF realisation in an IP in SCA has been summarised in a tabulated form in Table 4-1.

Table 4-1 Summary of Intonational marking of CF and prosodic phrasing, and different segmental processes accommodated within prosodic domains in SCA

Variant	Pre-focus constituents		Focused constituents		Post-focus constituents	
SCA	**Intonational marking**					
	Pitch Accent	*Boundary tone*	*Pitch Accent*	*Boundary tone*	*Pitch Accent*	*Boundary tone*
	L* *Or* L*+H	H_P	L* *Or* L*+H	fH_P	-----	L%
	Prosodic Phrasing					
	[L*H_P] *Or* [L*+H H_P]		[L*fH_P] *Or* [L*+H fH_P]		Complete PRC (No conclusive evidence for post-focus dephrasing)	
	Segmental processes within prosodic domains					
	1) Intervocalic aspirate spirantisation 2) /r/ deletion					

Table 4-1 shows how CF initiates P-phrases demarcated by L* pitch accent and fH_P focus high boundary tone, while the phrases preceding the focused constituent are characterised by L*H_P specification. As has already shown in §4.3.3, in SCA, pre-focused constituents demonstrate a tendency to be grouped together specified by L*+H pitch accent and H_P boundary tone. Normally, when a string of focused constituent is longer, or contain more than one P-word, the sequence is characterised by L*+H pitch accent.

As far as the post-focus constituents are concerned, the pitch contour shows complete PRC. Although intonational contours support post-focus dephrasing, since all high boundary tones are not realised in the post-focus sequence, the segmental cues demonstrated in §4.3.4 hint towards the existence of prosodic boundaries within the sequence. The claim for post-focus PRC is further supported by the results of the experiment (see §4.4) conducted to investigate the phonetic cues to CF in SCA. Results show that post-focus constituents do not maintain significant durational difference from their WF renderings. This exhibits that in CF context these constituents do not undergo durational reduction, which is suggestive of dephrasing.

4.4 Phonetic cues to CF in SCA

The objective in this section is primarily to investigate the phonetic cues adopted by SCA to highlight a particular information. This section will report an experiment conducted on SCA in order to study the phonetic cues to CF in the variety. The experiment studied phonetic effects of focus on pre-focus, focused and post-focus constituents. The investigated cues in the experiment were those of pitch and duration in the observed constituents.

4.4.1 Methodology

In the experiment, two sets of utterances were compared: one in WF realisation and the other in CF context. The experimented sentence sets comprised of identical and equal numbers of sentences, and the sentences were in unmarked SOV word order. Renderings in WF condition were novel sentences uttered in response to the question *ki hol?* (What happened?), whereas in the second set, CF was placed on the word in object position (see below in (16) and (17)). In order to create CF environment, the speakers were asked declarative questions against each of their WF utterances. These declarative questions were asked by replacing objects with different words. The speakers were then asked to rectify the (supposed) mistakes committed by the recordist by reuttering the sentences once again. Words in object position in the rectified utterances are in contrastive relation with those in WF utterances in the corresponding position. The experiment was conducted for both di- and tri-syllabic words in the two different focus conditions. The schema representing the data collection process is given below.

16) *The First set of sentences* (WF)

ki ho-l ?
what happen-PST3

a. rɔmɛn-ɛ mamɔr buli ko-l-ɛ
Ramen-NOM rust that say-PST3
Ramen said mamɔr (rust).

b. rɔmɛn-ɛ mɔrɔna buli ko-l-ɛ
Ramen-NOM threshing that say-PST-3
Ramen said *mɔrɔna* (threshing).

17) *The Second set of sentences* (words with CF are in boldface)

rɔmɛn-ɛ matal buli ko-lɛ ?

Ramen-NOM drunk that say-PST3

Did ramen said *matal* (drunk)?

a. nai nai rɔmɛn-ɛ **mamɔr** buli ko-l-ɛ

no no Ramen-NOM **rust** that say-PST-3

No, no, Ramen said rust.

b. nai nai nɔgɛn-ɛ **mɔrɔna** buli ko-l-ɛ

No, no, Nagen-NOM threshing that say-PST-3

No, no, Ramen said threshing.

The specimen sentences given in (16) constitute the WF data set with di- (16a) and tri- (16b) syllabic words in object position. The second set of utterances, given in (17), demonstrate the CF data-set, which, similar to the first set, contain both di- (17a) and tri- (17a) syllabic words in object position. Words in the object position in the second set bear CF and are written in boldface. The reason behind using two different lengths of focused words is to explore any influence word length has on focus realisation.

4.4.1.1 Subjects

For the data 3 (three) male and 2 (two) female speakers (20 to 30 years old) from Sivasagar District of Assam were recorded in the recording booth of Phonetics and Phonology Lab, Indian Institute of Technology Guwahati.

4.4.1.2 Data analysis

All the pre-focused, focused and post-focused constituents of the clauses under comparison are measured for their pitch and duration values at the word level using PRAAT (Boersma & Weenink, 2016). The values were then analysed running a Repeated Measures ANOVA (henceforth RM ANOVA) test in StataMP13 (StataCorp, 2013). In the test, pitch and duration values were dependent variables and word length and focus status were fixed factors, and speakers as random factors. A total of five speakers (two female and three male) were recorded who produced four iterations of the recorded sentences using a Tascam DR-100mkII recorder with a Shure SM10A-CN head-worn microphone in wav format at the frequency of 44.1 kHz with 16 bit resolution. Out of four iterations, only three were considered for the statistical test. “RM ANOVA have an assumption that the within-subject covariance structure is compound symmetric, also known as,

exchangeable" (Bruin, 2016). Therefore, the test apart from providing the statistical insight into the impact of focus on F_0 and duration values of focused, pre-focus and post-focus constituents, shows the iteration*factor interaction within speakers.

In order to tackle inter-speaker variations, pitch and duration values were normalised using the z-score normalisation method (Disner, 1980; Rose, 1987; 1991) before running the statistical tests. In our study, for the statistical analysis each F_0 and duration value is calculated by using the formula demonstrated below (18), though only F_0 has been demonstrated here.

18) $F_{0\,norm} = (F_{0\,i} - F_{0\,aver})/s$

Where
- $F_{0\,i}$ = F_0 value of an individual point
- $F_{0\,aver}$ = average of all the F_0 values in a P-phrase
- s = standard deviation of all F_0 values in a P-phrase

A sum total of [20(expressions) x 5(speakers) x 2(focus conditions) x 3(iterations)] 600 (six hundred) utterances comprise the current data set, which is equally distributed into di- and tri-syllabic words in focused position: 300 (three hundred) utterances with di-syllabic and 300 (three hundred) with tri-syllabic words in object position.

In case of focused and pre-focused constituents, F_0 max and min are measured at the right and left half of the constituents respectively. It was done so because if we refer to Figures 4-14 and 4-15 we see that both pre-focused and focused constituents show rising contours with low pitch accent manifested within the first half and high boundary tone realised in the second half of the constituent. In case of the post-focus constituent *buli* (that), F_0 was measured at three points: onset, mid and offset so that the significance level of post-focus compression may be explored.

In order to increase the accuracy of the pitch normalised contours displayed in Figures 4-14 and 4-15, pitch values are measured for each syllable at 10 (ten) points with equal intervals.

4.4.2 Findings

The findings of the experiment will be discussed below with reference to pitch and durational changes introduced by CF. This section is divided into two sections where the first part reports with the impact of CF on the pitch values of pre-focus, focused and post-

focus constituents in the experimented declarative utterances. The second subdivision illustrates how CF interacts with the durational measurements of the said constituents. In half of the occurrences, the focused constituent is disyllabic and in the other half, it is trisyllabic. Apart from the focused constituent, the effect of CF on the pre- and post-focus constituents has been separately reported for both di- and trisyllabic focused words

4.4.2.1 Pitch (F_0)

Contours generated by z-score normalised pitch values (Figure 4-14 and 4-15) provide us with a fair idea of the impact of CF (represented by red dashed line) on the overall pitch contour of an IP as against its WF variant (represented by black solid line). WF lines in the diagrams below demonstrate two pitch rises designating two P-phrases and corresponding to subject and object + complementiser combination from left to right; the IP final verb lacks pitch accent. As already stated in the chapter, these rises are caused by P-phrase initial low pitch accents (L*) and final high boundary tones (H_P).

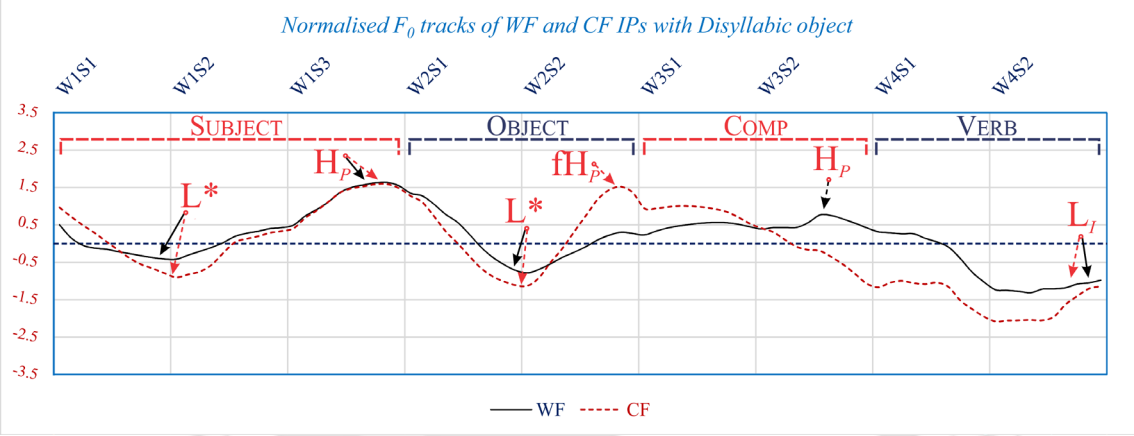


Figure 4-14 Normalised pitch contours of identical sentences in WF and CF conditions. The black solid line represents WF utterances and red dashed line represents the same sentences uttered with CF on the disyllabic object.

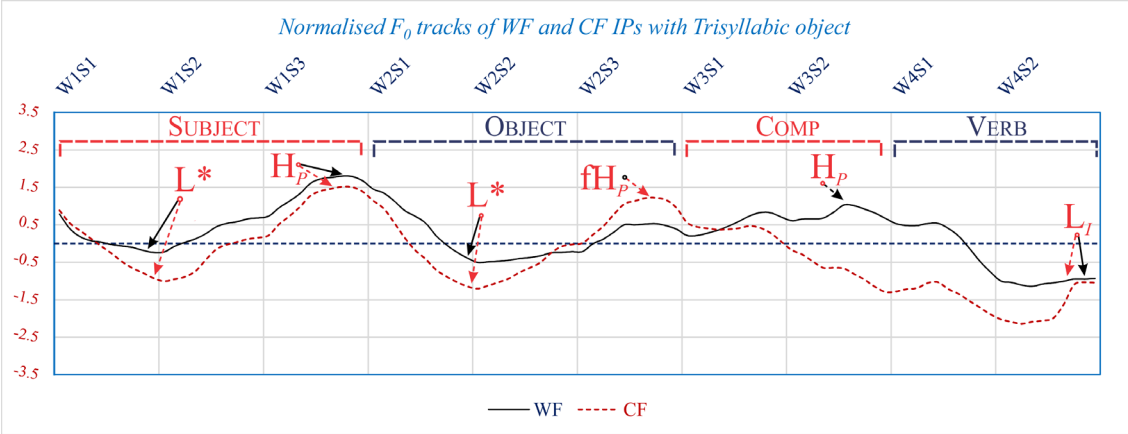


Figure 4-15 Normalised pitch contours of identical sentences in WF and CF conditions. The black solid line represents WF utterances and red dashed line represents the same sentences uttered with CF on the trisyllabic object.

When one looks at the CF contour, which bears CF on the object, one sees how the focused constituent is characterised by lower pitch accent (L*) and focused induced higher prosodic boundary (fH_P). Due to complete post-focus PRC, the high P-phrase boundary tones (H_P) seen in WF contours in both the diagrams are not materialised. As far as pre-focus pitch compression is concerned, though Figure 4-15 shows compression, in Figure 4-14 it is marginal (not statistically significant). In order to see whether this compression is statistically significant, a one-way ANOVA test was conducted on the values extracted from different constituents (pre-focused, focused and post-focused), the results of which are reported and discussed below.

4.4.2.1.1 F_0 values of pre-focus constituent

The measurement of F_0 values in the pre-focus constituents for both the syllable types show that this constituent undergoes pitch compression. While the F_0 max does not confirm consistent significant difference between the two focus realisations, the F_0 min value drops significantly.

Table 4-2 Comparison of the pitch values of pre-focus constituents in (di- and tri-syllabic) CF and WF conditions

Pre-focus Constituent

Category	**Variable**	**WF**		**CF**		**ANOVA**		**Focus#iteration**	
		Mean	SD	Mean	SD	F	*p-value*	F	*p-value*
Disyllabic focus	F_0 max	1.24	.70	1.27	.64	(1, 98) = 0.07	0.79	(2, 196)=1.13	0.32
	F_0 min	-.70	.73	-.96	.33	(1, 98) = 9.27	0.003	(2, 196)= 0.36	0.70
Trisyllabic focus	F_0 max	1.41	.72	1.23	.49	(1, 98) = 2.70	0.10	(2, 196)= 0.70	0.50
	F_0 min	-.46	.49	-1.05	.30	(1, 98) = 101.14	0.00	(2, 196)= 0.67	0.51

As it is reported in Table 4-1 and displayed in Figure 4-14, the F_0 max of a CF pre-focus constituent does not show significant departure from the WF baseline both when the focused constituent is di-syllabic ($p>.05$, $F\ [1, 98]=0.07$, $p=0.79$) and tri-syllabic ($p>.05$, $F\ [1, 98]=2.70$, $p=0.10$). In case of F_0 min, its value regularly decreases: $p<.05$ when the focus is di-syllabic ($F\ [1, 98]=9.27$, $p=0.003$) and when the focus is tri-syllabic ($F\ [1, 98]=101.14$, $p=0.00$). Here the claim is not about whether the length of sentence medial focused constituent exercises any influence on the pre-focus constituent, but to observe and affirm the consistency of pre-focus pitch variation. Further, the last two columns in the table demonstrate no significant interaction between focus realisations and iterations.

4.4.2.1.2 F_0 values of focused constituent

When a constituent is focused, as we can see in Figure 4-14 and 4-15, it forms a P-phrase and bears high focus boundary tone (fH_P) on its last syllable. In WF contours the word in object position does not form a phrase independently at the prosodic level, and hence remains tonally unspecified at its boundary. In CF condition, on the other hand, focus induces a prosodic boundary right aligning with the focused constituent, as a result the last syllable of the word gets tonally associated with a high focus boundary tone (fH_P). Since the object final syllable gets associated with a high focus boundary tone fH_P, it is marked by a higher pitch value compared to when it is not focused.

Table 4-3 Comparison of the pitch values of focused constituent in (di- and tri-syllabic) CF and WF conditions.

Focused Constituent

Category	Variable	WF		CF		ANOVA		Focus#iteration	
		Mean	SD	Mean	SD	F	*p-value*	F	*p-value*
Disyllabic focus	F_0 max	.20	.38	1.07	.49	(1, 98) = 154.93	0.00	(2, 196)= 2.59	0.07
	F_0 min	-.86	.44	-1.19	.41	(1, 98) = 19.11	0.00	(2, 196)= 0.51	0.59
Trisyllabic focus	F_0 max	.44	.43	1.01	.74	(1, 98) = 29.76	0.00	(2, 196)=2.08	0.12
	F_0 min	-.61	.48	-1.30	.38	(1, 98) = 77.29	0.00	(2, 196)= 0.07	0.93

In Table 4-2 both F_0 values – max and min relating to the focused constituent are presented. The F_0 max value of focused constituent displays statistically significant increase, where $p<0.05$ for both disyllabic (F [1, 98] =154.93, $p=0.00$) and tri-syllabic (F [1, 98]=29.76, $p=0.00$) constituents. CF further forces low pitch accent to drop to new minimum for both the word lengths; F_0 min is always higher in WF conditions compared. RM ANOVA results show significant F_0 fall on the first syllable of both disyllabic ($p<.05$, F [1, 98]=19.11, $p=0.00$) and trisyllabic ($p<.05$, F [1, 98]=77.29, $p=0.00$) focused words. Thus we see that in CF condition, while F_0 min (on the first syllable) of the focused constituent lowers significantly, and F_0 max (at the right boundary) gets a boost. The values given in the right-most columns show that the three iterations of different focused conditions are compound symmetric, and therefore, they do not exhibit significant focus#iteration interaction.

4.4.2.1.3 F_0 values of post-focus constituent

The normalised pitch contours displayed in Figures 4-14 and 4-15 visibly testify the post focus pitch compression. In order to verify whether this compression is statistically significant F_0 values are measured and compared at three points in the post focus constituent *buli*, which otherwise forms a single P-phrase together with the word preceding it. Pitch values have been recorded at initial, medial and final positions in order to measure the difference between the two normalised pitch contours of the complementiser *buli*. As already mentioned, in WF context, object+*buli* form a single P-phrase with a high boundary tone (H_P) right aligned with *buli* inducing a pitch peak on the final syllable of the word. With the formation of P-phrases by the focused constituents (object) in CF condition, the high boundary tone is not realised as an effect of post focus PRC. As such,

the hypotheses here are: 1) in CF condition, word initially, *buli* should display a significantly higher pitch value; 2) word medially, the pitch contours may or may not maintain an important difference; 3) finally, as the high tone (H_P) disappears we should come across a radical pitch compression at the offset of *buli*.

Table 4-4 Comparison of pitch realisation on post-focus buli (that-Complementiser) at three positions – onset (starting), middle and offset (final) in two focus realisation

Post-focus Constituent

Category	***F0* values on *buli***	**WF**		**CF**		**ANOVA**		**Focus#iteration**	
		Mean	SD	Mean	SD	F	*p-value*	F	*p-value*
Disyllabic focus	*F0* @onset	.009	.44	.55	.52	(1, 98) = 49.87	0.00	(2, 196)= 2.31	0.10
	F0 @mid	.16	.43	.11	.50	(1, 98) = 0.47	0.49	(2, 196)= 2.05	0.13
	F0 @offset	.09	.52	-1.17	.40	(1, 98) = 276.75	0.00	(2, 196)= 1.26	0.28
Trisyllabic focus	*F0* @onset	.02	.41	.29	.67	(1, 98) = 8.78	0.00	(2, 196)= 2.04	0.13
	F0 @mid	.36	.36	-.34	.56	(1, 98) = 79.72	0.00	(2, 196)= 1.11	0.33
	F0 @offset	.31	.53	-1.31	.35	(1, 98) = 413.02	0.00	(2, 196)= 0.50	0.61

The statistical results demonstrated in Table 4-3 establishes the aforementioned hypotheses to be true. The F_0 value at the onset of *buli* is significantly higher in CF condition as it is measured at a position which immediately follows high boundary tone of the focused constituent: $p<0.05$ when *buli* follows both disyllabic (F [1, 98]=49.87, $p=0.00$) and tri-syllabic F [1, 98]=8.78, $p=0.00$) focused constituents. However, at the mid position, the two contours do not always maintain a significant difference of values: $p>0.05$ when followed by a disyllabic focused constituent (F [1, 98]=0.47, $p=0.49$) and $p<0.05$ when followed by a tri-syllabic focused constituent (F [1, 98]=79.72, $p=0.00$). This is in conformity with our second hypothesis. Finally at the offset of *buli* we see a drastic pitch compression when preceded by either disyllabic ($p<0.05$, F [1, 98]=276.75, $p=0.00$) or tri-syllabic ($p<0.05$, F [1, 98]=413.02, $p=0.00$) focused word. The pitch variation within iterations in two different focus conditions is significantly different. Since the iterations do not significantly differ from one another, it can be claimed that they maintain a compound symmetry, in that they are exchangeable with one another.

4.4.2.2 Duration

Similar to pitch values, duration values are also measured for the pre-focus, focused and post-focus constituents with an aim to examine the durational effect of CF on these constituents. The results of a one-way ANOVA test conducted reveal that in SCA, under

CF condition, the lengths of both pre-focus and focused constituents get increased on the temporal scale. As such, duration cannot be taken as independent and direct cue to CF.

4.4.2.2.1 Duration of pre-focused constituent

Duration of the pre-focus constituent shows an important increase in its value when it precedes a constituent with CF.

Table 4-5 Comparison of the duration values of pre-focus constituents in (di- and tri-syllabic) CF and WF conditions

Pre-focus Constituent

Category	**Variable**	**WF**		**CF**		**ANOVA**		**Focus#iteration**	
		Mean	SD	Mean	SD	F	*p-value*	F	*p-value*
Disyllabic focus	Duration	.40	.48	.59	.32	(1, 98) = 8.17	0.005	(2, 196)= 0.09	0.92
Trisyllabic focus	Duration	.27	.22	.75	.30	(1, 98) = 140.82	0.00	(2, 196)= 1.26	0.28

Table 4-4 demonstrates that the length of focused constituents does not seem to exercise any effect on this durational expansion: when the focused constituent is disyllabic $p<0.05$ ($F [1, 98]=8.17$, $p=0.005$) and also when it is trisyllabic $p<0.05$ ($F [1, 98]=140.82$, $p=0.00$). Here also, the variation within iterations is not statistically significant as can be seen in the right-most two columns, i.e. the iterations are compound symmetric and exchangeable.

4.4.2.2.2 Duration of focused constituent

A constituent bearing CF is characterised by an overall durational lengthening; this lengthening is also accompanied by an increase in the final syllable duration.

Table 4-6 Comparison of duration values of focused constituent in (di- and tri-syllabic) CF and WF conditions

Focused Constituent

Category	**Duration of**	**WF**		**CF**		**ANOVA**		**Focus#iteration**	
		Mean	SD	Mean	SD	F	*p-value*	F	*p-value*
Disyllabic Focus	Object	.83	.50	1.20	.37	(1, 98) = 20.11	0.00	(2, 196)= 0.69	0.50
	Final σ	-.50	.24	-.42	.22	(1, 98) = 5.25	0.02	(2, 196)= 0.22	0.81
Trisyllabic focus	Object	.98	.27	1.39	.30	(1, 98) = 67.12	0.00	(2, 196)= 0.86	0.43
	Final σ	-1.09	.09	-1.04	.11	(1, 98) = 13.64	0.00	(2, 196)= 0.05	0.95

As it can be read from Table 4-5, the overall durational increase is significant for both disyllabic ($p<0.05$, $F [1, 98]=20.11$, $p=0.00$) and trisyllabic ($p<0.05$, $F [1, 98]=67.12$, $p=0.00$) constituents. Further our claim that CF induces a phrasing effect on the focused constituent is phonetically evident in the final syllable lengthening. In both types of focused words this lengthening is statistically significant ($p<0.05$): disyllabic ($F [1, 98]=5.25$, $p=0.02$) and trisyllabic ($F [1, 98]=13.64$, $p=0.00$). As far as the variation within iterations are concerned, it is statistically not significant (see the last two columns of Table 4-5).

4.4.2.2.3 Duration of post-focus constituent

The results of the one-way ANOVA test conducted on the post-focus constituents support the claim made in this chapter that CF in SCA initiates complete PRC on the phrases following it without removing their prosodic boundaries. First, in the experiment, the entire post-focus sequences were compared against their WF renderings for duration values. Next, the final syllable of the complementiser (*buli*), which constitutes P-phrase together with the object in WF condition but undergoes pitch compression in CF context, was measured, and a comparison was made between its temporal realisations in two focus conditions. It was done with an intention to see whether CF on the object dephrases the following constituents. In case of dephrasing, the syllables which are phrase final in WF rendering are supposed to undergo durational reduction when they follow the focused constituent. Contrary to this, no durational effect on the syllables would reflect the absence of dephrasing since the latter does not affect the phrasing in the post-focus sequence.

Table 4-7 Comparison of the duration values of post-focus constituent in (di- and tri-syllabic) CF and WF conditions

Focused Constituent

Category	**Duration of**	**WF**		**CF**		**ANOVA**		**Focus#iteration**	
		Mean	SD	Mean	SD	F	*p-value*	F	*p-value*
Disyllabic Focus	post-focus	1.43	.40	1.38	.28	(1, 98) = .80	0.37	(2, 196)= 0.73	0.48
	'-li'	-1.40	.10	-1.42	.07	(1, 98) = 2.31	0.13	(2, 196)= 0.05	0.94
Trisyllabic focus	post-focus	1.37	.24	1.36	.25	(1, 98) = 0.02	0.87	(2, 196)= 1.32	0.27
	'-li'	-1.23	.07	-1.24	.08	(1, 98) = 1.00	0.32	(2, 196)= 0.10	0.90

From the RM ANOVA test it was found that the entire post-focus sequence, though undergo substantial pitch compression, does not experience ample durational change. P>0.05 for the post-focus durational change following both disyllabic (F [1, 98]=.80, p=0.37) and trisyllabic (F [1, 98]=0.02, p=0.87) focused words (Table 4-6).

Further, in Table 4-6 the durational values of the syllable *–li* in the two focus conditions have been presented. This syllable occurs phrase finally in the WF rendering, where it bears the P-phrase boundary tone H_P of the L*H_P pitch pattern (see Figure 4-14 & 4-15). In CF rendering, even though it does not bear any boundary tone, it does not undergo durational reduction. When preceded by disyllabic focused constituents, p>0.05 (F [1, 98]=2.31, p=0.13) and also when preceded by trisyllabic focused constituents p>0.05 (F [1, 98]=1.00, p=0.32). These results show that in the post-focus string, CF does not reduce the length of phrase final syllables, which otherwise occur at P-phrase boundary in WF context. This, in addition to the evidence of segmental processes demonstrated in §4.3.5 in support of post-focus PRC, strengthens our claim that post focus constituents do not necessarily experience dephrasing in SCA. RM ANOVA, further, does not show any significant interaction between the repeated duration values of the observed constituents and focus realisaions (given in the last two columns of Table 4-6).

4.4.3 Summary

In this section, we have seen that pitch and duration values cue CF in SCA: the focused constituent shows greater pitch range and increased length. Pitch values undergo pitch compression in both pre- and post-focus constituents. Though F_0 max does not always show trends of significant compression on pre-focus constituents, F_0 min always maintains a significantly lower value in such constituents. The pitch compression on post-focus constituents is comprehensive. While the durational value of the pre-focused constituents shows significant increase, the post-focus sequence does not change remarkably. This section further justifies the claim that SCA does not necessarily leave an impact on the prosodic phrasing of the post-focus sequence; it takes away the tonal specifications in the sequence with an exception only to IP final boundary tone L_I.

4.5 Conclusion

In this chapter of the dissertation, it has been explored how SCA adopts post-lexical prosody as a means of highlighting an information which is uttered in contrast to

something that is given in the context. SCA adopts a demarcating strategy in order to highlight a constituent with CF: it assigns a low starred tone (L*) to the first syllable and high focus boundary tone to the final syllable (fH$_P$). Such constituents, apart from being marked at the intonational level, form phonological domains, which accommodate segmental processes such as aspirated stop spirantisation and /r/ deletion. These domains are further characterised by greater pitch range and increased durational values. Although pre-focus constituents are often found to form a composite prosodic phrase, the constituents following the focused constituent seem to retain their prosodic phrasing. In contradiction to not-significant pitch compression in the pre-focus, post-focus sequence demonstrates a radical PRC.

Chapter 5 Contrastive focus phonology in NVA

5.1 Introduction

In the preceding chapter, the discussion was on prosodic manifestation of CF in SCA with reference to intonational phonology, and phonetics. In this chapter, the aim is to demonstrate, in the same vein as it is in the last chapter, how CF is manifested in NVA. The first part of the chapter is dedicated to the description of CF phonology of NVA, and the second half reports an experiment conducted to investigate various phonetic cues to CF in NVA. §5.2 elaborately discusses the phonological aspects of CF in NVA, and in §5.3 an experiment has been reported which was conducted to observe the phonetic cues to CF in the variety. At the end of the chapter, in §5.4, all the discussed topics have been summed up.

5.2 CF phonology in NVA

In Chapter-3, we have seen how in WF context an NVA declarative utterance shares similarity with its SCA equivalent at the prosodic level. Both the varieties demonstrate rising pitch contour on non-final constituents and a fall on the final constituent[32]. In spite of maintaining these similarities and being the dialectal variants of the same language (Assamese), the two varieties adopt different ways of CF marking. At the intonational level, similar to SCA, NVA marks constituents with CF with rising contours; however the rise on focused constituents in NVA is phonologically different from the rise we see in SCA. While in SCA, constituents with CF are demarcated intonationally by a prosodic boundary, in NVA such prosodic demarcation is not a requirement. In the following paragraphs, we will furnish evidence in support of this proposal.

5.2.1 Methodology

The methodology adopted to procure NVA data is identical to the methodology undertaken in SCA data collection as depicted in §4.3.1 of chapter 4. Therefore, without going into methodological details we will move directly towards exploring the prosodic ways of CF marking in NVA. Five male speakers, belonging to the age group of 22 to 28 years from

[32] Though SCA and NVA show falling contour on IP final constituents, SCA, unlike NVA, lacks pitch accent.

Nalbari district were recorded in a quiet environment. Data size, recording settings and instruments employed here are analogous to those used in SCA data recording.

5.2.2 Intonational evidence

In NVA, CF bearing constituents always initiate P-Phrases, which bear the IP final pitch accent in IP domains. This is true for any constituent with CF at any position in an IP; such constituents behave as the most prominent prosodic constituents in IPs, and they are never followed by another pitch rise. In chapter 3, it has been demonstrated that in WF context, NVA assigns H* pitch accent to IP final constituents which is followed by L_I boundary tone. In this chapter, it will be shown that constituents with CF always bear the IP final pitch accent, and instead of an H* pitch accent they bear a rising pitch accent.

The first syllable of such focused constituents receives the starred tone of the bitonal pitch accent L*+fH, and as it is not demarcated by prosodic boundary, it behaves as a single prosodic phrase together with all the constituents following it. The low starred tone is accompanied by a high trailing tone that causes the rise on the focused constituent (L*+fH); this pitch accent is the prosodic head for the sequence following it within the same IP.

Recall from chapter 3 that with regard to IP final pitch accent placement in WF declarative IPs, NVA is different from SCA. Utterance (1) can be considered where, unlike SCA declarative IPs, the final constituent (here *kʰuizlak* 'ask-PST3') forms a P-phrase; the first syllable of the constituent bears the final pitch accent (H*) of the IP.

	L* H_P	L* H_P	L*H_P	H* L_I
1)	[[nɔgɛn-ɛ]$_P$	[nɔjɔn-ɔk]$_P$	[mala]$_P$	[kʰuiz-lak]$_P$]$_I$
	Nagen-NOM	Nayan-ACC	garland	ask-PST3

Nagen asked Nayan for a garland.

In (1), we have four P-phrases: *nɔgɛnɛ*, *nɔjɔnɔk mala* and *kʰuizlak*: the initial three are characterised by repeated rising pitch contour (L*H_P), while the final P-phrase shows a falling pitch pattern (H*L_I). As stated earlier (Chapter-3), these P-phrases are marked by pitch accents and boundary tones; in case of the final P-phrase, it has been assumed here that the P-phrase boundary tone is overridden by the presence of the IP final boundary tone.

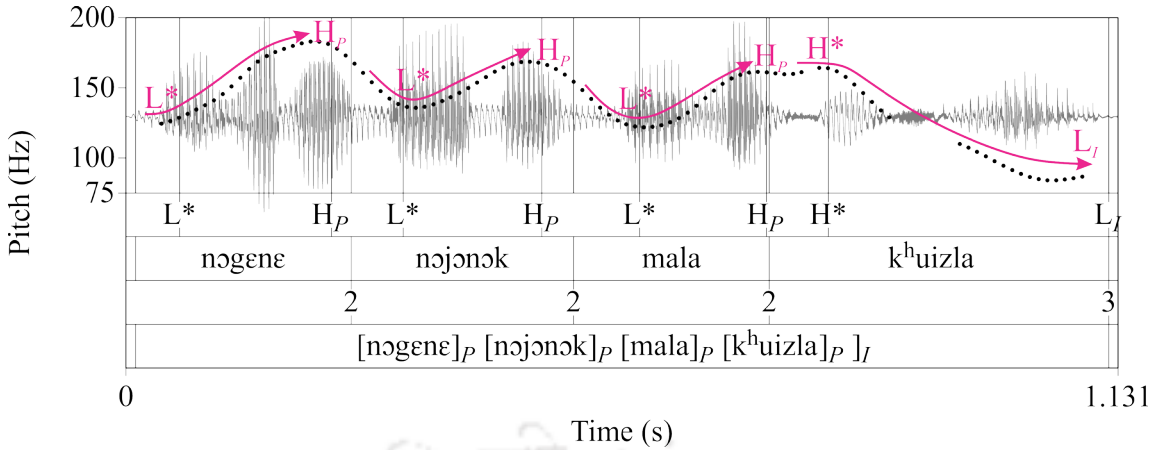


Figure 5-1 WF rendering of the sentence *nɔgɛnɛ nɔjɔnɔk mala k^{h}uizlak* 'Nagen asked Nayan for a garland'.

In Figure 5-1, the non-final P-phrases: *nɔgɛnɛ*, *nɔjɔnɔk* and *mala*, designated by L*H$_P$ pitch specifications, demonstrate rising pitch contours, whereas the final P-phrase *k^{h}uizlak* shows a falling contour since its first syllable is specified for H* pitch accent and the final syllable manifests the low IP boundary tone. Although low P-phrase boundary is assumed aligning with the right of edge of *k^{h}uizlak*, any tone assigned to it gets overridden by low IP boundary tone.

If we observe CF executions on different constituents of the same sentence, we see that in NVA a constituent bearing CF is intonationally marked by bitonal pitch accent L*+fH; the starred tone is realized on the first syllable of the constituent where pitch value of the *F$_0$* contour is at its lowest. After docking at its lowest value, the *F$_0$* contour rises immediately, and this rise spreads over next adjacent syllables to the right, irrespective of any prosodic boundary; the spread of this rise may range from one to two syllables. Here we may consider utterance (2), where CF is on *mala* 'garland'.

	L* H$_P$	L* H$_P$	L*+fH	L$_I$
2)	[[nɔgɛn-ɛ]$_P$	[nɔjɔn-ɔk]$_P$	[**mala**	k^{h}uiz-lak]$_P$]$_I$
	Nagen-NOM	Nayan-ACC	**garland**	ask-PST3

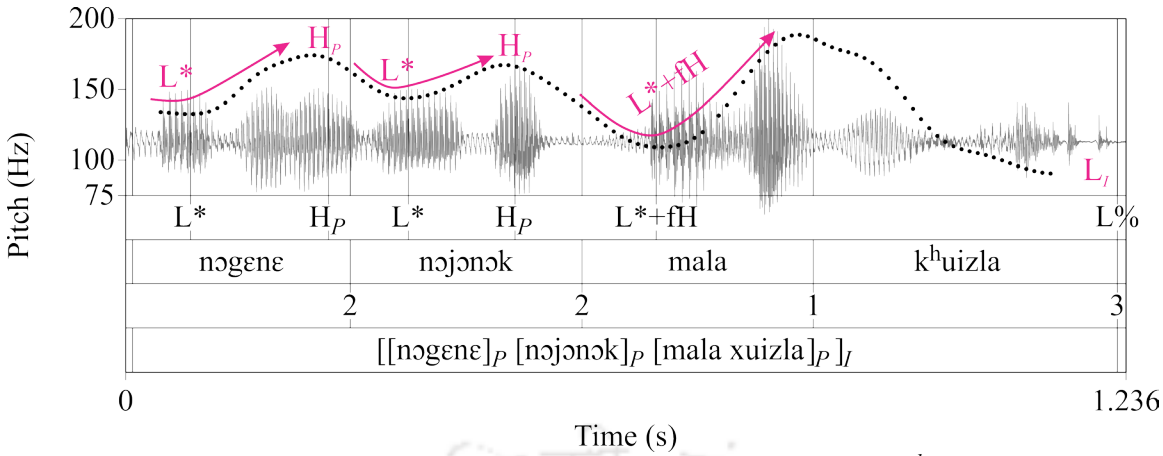


Figure 5-2 Intonational contour of the sentence *nɔgɛnɛ nɔjɔnɔk mala k^{h}uizlak* 'Nagen asked Nayan for a garland' uttered with CF on *mala*.

Figure 5-2 representing (2) displays how CF is marked by L*+fH pitch accent, where the low pitch accent aligns with the first syllable of *mala* and the trailing focus high tone is realised on the following adjacent syllable. In NVA, CF initiates P-phrases, which include all the constituents following the focused constituent, in the same IP domain. As such, in (2) *mala* and *k^{h}uizlak* constitute a single P-phrase headed by the focus pitch accent L*+fH and demarcated by IP boundary tone.

Other CF realisations of the same string of words demonstrate an identical intonational marking of the focused constituent. For instance, when CF is on the IP initial constituent, as it is the case in (3), where focus is on the IP initial subject *nɔgɛnɛ* 'Nagen-NOM', the sequence of focused plus post-focus constituents behave as a unified P-phrase. This prosodic phrase is intonationally headed by the bitonal CF pitch accent L*+fH.

	L*+fH$_P$			L$_I$
3)	[[nɔgɛn-ɛ	nɔjɔn-ɔk	**mala**	k^{h}uiz-lak]$_P$]$_I$
	Nagen-NOM	Nayan-ACC	**garland**	ask-PST3

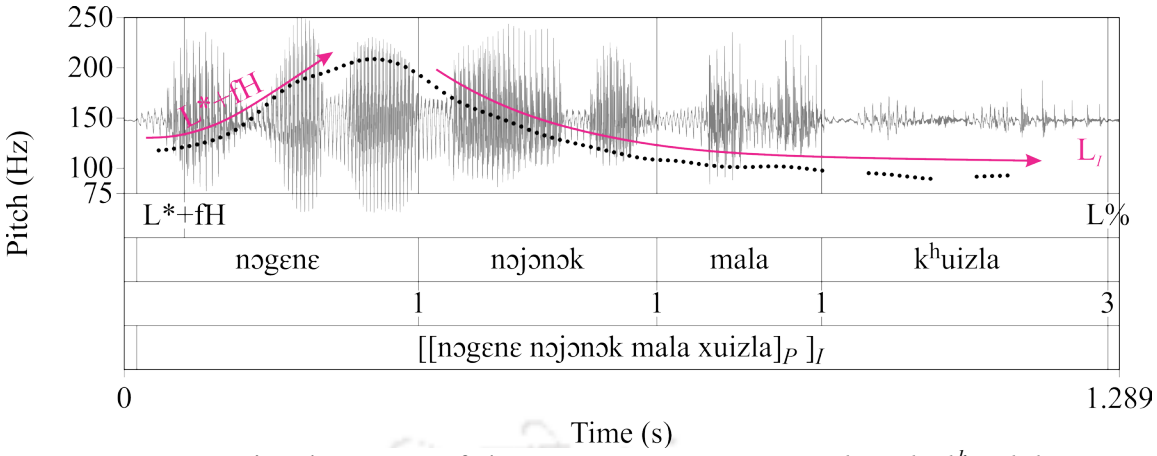


Figure 5-3 Intonational contour of the sentence *nɔgɛnɛ nɔjɔnɔk mala khuizlak* 'Nagen asked Nayan for a garland' uttered with CF on *nɔgɛnɛ*.

In Figure 5-3, which represents the IP given in (3), the focused constituent *nɔgɛnɛ* is designated by focus rising pitch accent. As a result, a rising contour can be seen on the focused constituent, where the starred low tone is realised on the initial syllable and the trailing focus high tone slurs over the next two syllables. Since no other syllable in the post focus sequence is tonally specified, the pitch contour shows a smooth drop which continues until the IP boundary, which is specified for a low IP boundary tone (L_I). The focused constituent *nɔgɛnɛ* constitutes a single P-phrase in combination with the post-focus sequence *nɔjɔnɔk mala khuizlak*; thus here, since the initial constituent in the IP receives CF, the entire utterance behaves as a single P-phrase apart from being an IP.

Besides a higher pitch excursion, the pitch rise caused by the bitonal CF pitch accent in Figure 5-2 may not seem to be different from the rise seen on the same constituents in WF context (Figure 5-1). The rise seen in the WF NVA IP is created due to the tonal pattern L^*H_P assigned to non-final P-phrases. When we consider more examples, we see that in WF context the high boundary tone is always realized on the nucleus of the final syllable of the constituents forming non-final P-phrases (see chapter 3). This is not always true in case of CF pitch accent; the high tone may coincide with a prosodic boundary, but it does not phonologically align with it. In case of (1), the verb *khuizlak* forms an independent P-phrase, which is dominated by the IP node[33] blocking any segmental assimilation beyond its boundary. Whereas in (2), the focused constituent *mala* forms a P-phrase collectively with the following constituent *khuizlak*, and thus deletes the

[33] The differentiation between WF and CF nuclear accent in the dissertation is also supported by segmental evidence. It has been discussed in detail in the section on phonological cues to CF.

phrase level prosodic boundary, which induces a boundary tone in WF context (1). In case of (3) also, the CF on *nɔgɛnɛ* removes all the prosodic boundaries following it, and hence their tonal specifications.

Next, the IP given in (4) will be considered which bears CF on *sabipat* 'key-DET', and as such, it forms a P-phrase together with all the constituents following it.

	L* H_P	L* H_P	L*+fH		L_I
4)	[[rɔmɛn-ɛ]$_P$	[dɔrza-r]$_P$	[**sabi-pat**$_F$	milɔn-ɔk	di-lak]$_P$]$_I$
	Ramen-NOM	door-GEN	**key-DET**	Milan-ACC	give-PST3

Ramen gave the door key to Milan.

The focused constituent is characterised by L*+fH pitch accent, which is the prosodic head of the P-phrase *sabipat milɔnɔk dilak* initiated by CF. The intonational contour generated by the IP has been demonstrated in Figure 5-4.

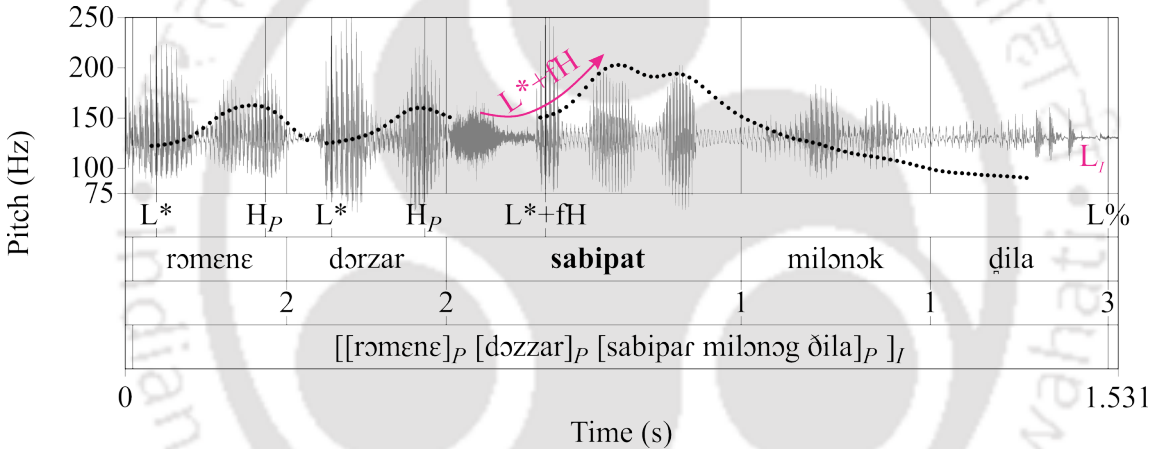


Figure 5-4 Intonational contour of the sentence *rɔmɛnɛ dɔrzar sabipat milɔnɔk dilak* 'Ramen gave the door key to Milan' uttered with CF on *sabipat*.

In Figure 5-4, F_0 value on *sabipat* is at its lowest on the first syllable (*sa-*) and highest on the second syllable (*bi*); this provides more justification for our proposal that CF high tone in NVA is in fact the trailing tone of bitonal pitch accent (L*+fH) rather than being a boundary tone. Unlike the pitch structure in non-final P-phrases, where we see high boundary tones (H_P) aligned with the right edge of prosodic phrases, in the present case, it is the penultimate syllable which hosts the high tone. The pitch contour maintains a smooth fall across the prosodic boundaries among P-words following the realization of focus high tone, indicating the absence of phrase level prosodic boundaries among these words.

5.2.3 Segmental evidence

It has so far been claimed that a constituent with CF in NVA forms a P-phrase conjointly with the constituents following it within a particular IP. This entails that the post-focus constituents undergo dephrasing under the influence of CF, and contribute to the focus induced P-phrase. It has been proposed in the preceding section that focus pitch accents on focused constituents are prosodic heads of the P-phrases initiated by CF in NVA. Apart from the absence of pitch accents and boundary tones in the post-focus sequence, the dephrasing in the sequence is also evident from various segmental processes taking place in the domain. In this section, some segmental evidence will be furnished which will buttress our argument that the combined domain of focused plus post-focus sequence is a phonological domain. The segmental evidence include /r/ assimilation, voicing assimilation, flapping and aspirate spirantisation, which are allowed within a phonological domain and blocked beyond it. Although different phonological processes have been referred here, the discussion here will mostly concentrate on /r/ assimilation and spirantisation; other processes will be mentioned whenever appropriate.

5.2.3.1 /r/ assimilation

It has already been discussed in chapter 3 (§3.4.2.2.1) how /r/ assimilates with coronal consonants following it within a prosodic domain. In this section, it will be shown how this assimilation is accommodated across constituents within CF initiated P-phrases in NVA. In (5), word final /r/ of *dɔrzar* 'door-GEN' assimilates into /s/ under the influence of the following /s/ occurring at the initial position of *sabipat* 'key-DET'.

	L*	H_P	L*		H_P	L*	H_P	H* L_I
5)	[[rɔmɛn-ɛ]$_P$		[dɔrzar		sabi-pat]	[milɔn-ɔk]		[di-lak]$_P$]$_I$
			[s]					
	Ramen-NOM		door-GEN		key-DET	Milan-ACC		give-PST3
	Ramen gave the door key to Milan.							

In (4) the /r/ assimilation, demonstrated above in (5), was reported as blocked due to the prosodic boundary inserted by CF just before *sabipat*. However, when *dɔrzar* receives CF focus, we get a different picture.

	L*	H_P	L*+fH				L_I
6)	[[rɔmɛn-ɛ]$_P$		[dɔrzar	sabi-pat		milɔn-ɔk	di-lak]$_P$]$_I$
			[s]				

In (6), *dɔrzar* receives CF, and hence constitutes a P-phrase together with all the post-focus constituents. On this occasion, /r/ assimilation is accommodated across *dɔrzar* and *sabipat* since the former, being the focused constitute, forms P-phrase together with all the constituents following it.

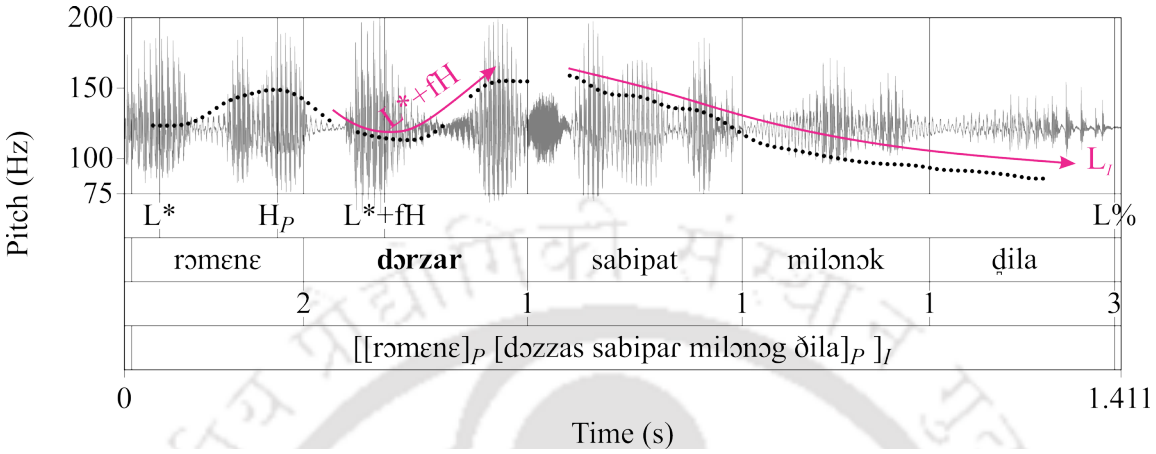


Figure 5-5 Intonational contour of the sentence *rɔmɛnɛ dɔrzar sabipat milɔnɔk dilak* 'Ramen gave the door key to Milan' uttered with CF on *dɔrzar*.

In Figure 5-5, it can be seen how the focused constituent *dɔrzar* is marked prominent in the IP with the help of rising pitch accent L*+fH, which is the prosodic head of the entire P-phrase *dɔrzar sabipat milɔnɔk dilak* created by CF. In the fourth tier of Figure 5-5, /r/ assimilation along with other segmental processes has been reported. The word initial /s/ of *sabipat* exercises an influence on the final /r/ of *dɔrzar*, highlighting the absence of any prosodic boundary higher than the rank of a P-word. This is in conformity with our claim that CF dephrases all the following prosodic phrases, and concatenates them into a single P-phrase headed by the pitch accent on the focused constituent.

5.2.3.2 Spirantization

As discussed in chapter 3, intervocalic aspirate spirantisation is another segmental process which is allowed only within a phonological domain, and blocked across separate domains. This intervocalic spirantisation takes place across P-word boundaries, if they are members of a single P-phrase. The word initial occurrences of aspirates are seen produced as fricatives when they are provided with intervocalic environment across P-word boundaries within P-phrase domain. In the following discussion, it has been demonstrated how CF phrasing may block or accommodate spirantisation across P-word boundaries.

In utterance (7), the word initial [k^h] in *k^{h}aba* retains its status as an aspirate plosive where the constituent receives CF.

	L*	H_P	L*+H		H_P	L* H_P	L*+fH	L_I
7)	[[rɔmɛn-ɛ]$_P$		[mak^{h}ɔn-ɔr		g^{h}ɔr-ɔt]$_P$	[kɔmla]$_P$	[**k^{h}a-ba** [k^h]	ge-isi]$_P$]$_I$ [ɣ]
	Ramen-NOM		Makhan-GEN		house-DAT	orange	eat-PRF	go-PST3

Ramen went to Makhan's house to eat oranges.

The intonational manifestation of (7) has been demonstrated in Figure 5-6, where P-phrase formation of the focused constituent in combination with the post-focus constituent has been shown.

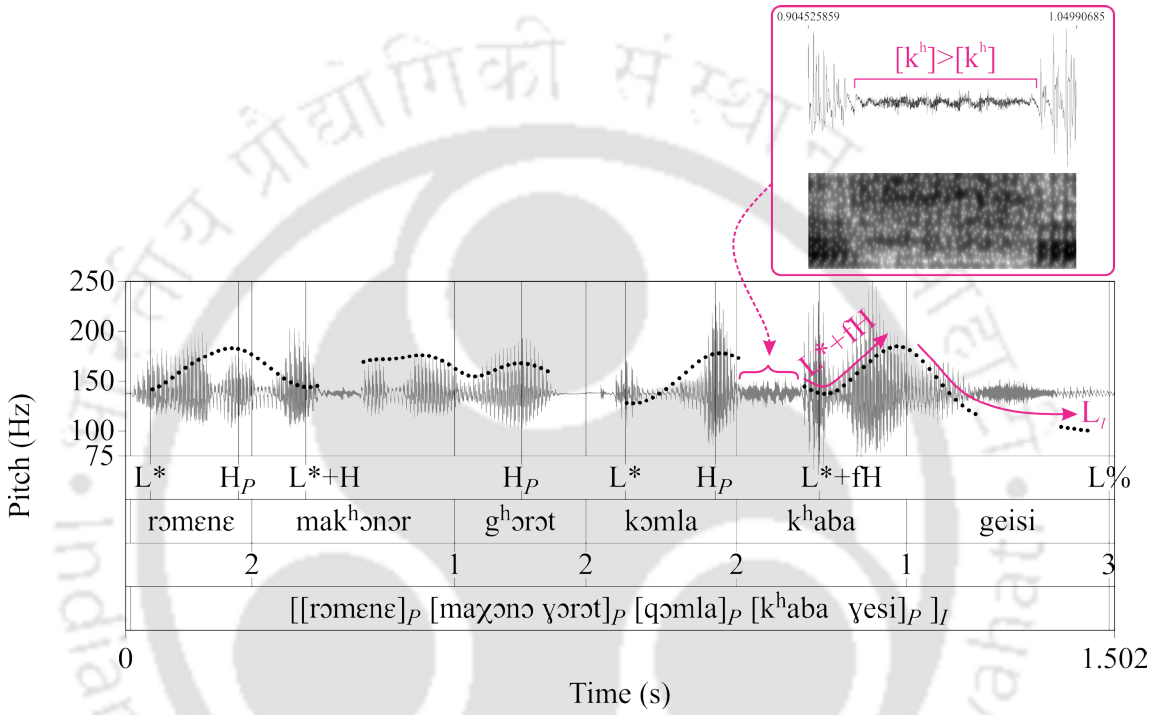


Figure 5-6 Intonational contour of the sentence *rɔmɛnɛ mak^{h}ɔnɔr g^{h}ɔrɔt kɔmla k^{h}aba geisi* (Ramen went to Makhan's house to eat oranges) uttered with CF on *k^{h}aba*.

Figure 5-6 shows how *k^{h}aba* is highlighted by a sharp pitch rise (due to L*+fH pitch accent) on it, and, as per the proposal in this dissertation, apart from being marked at the intonational level, the focused constituent initiates a phonological domain. It is this domain that creates a prosodic separation between *kɔmla* and *k^{h}aba*, and thus constrains the intervocalic atmosphere for [k^h] to undergo spirantisation.

Utterance (8) below bears CF on *kɔmla* and consequently, in accordance with the claim made in this chapter, a P-phrase is initiated taking the focused constituent and everything to its right.

	L*	H_P	L*+H	H_P	L*+fH	L_I
8)	[[rɔmɛn-ɛ]$_P$		[mak^{h}ɔn-ɔr	g^{h}ɔr-ɔt]$_P$	[**kɔmla** k^{h}a-ba	ge-isi]$_P$]$_I$
					[χ]	[ɣ]

Figure 5-8 instantiates the intonational contour of IP (8) which explicates [k^h] spirantisation in *k^{h}aba* as schematised in (8).

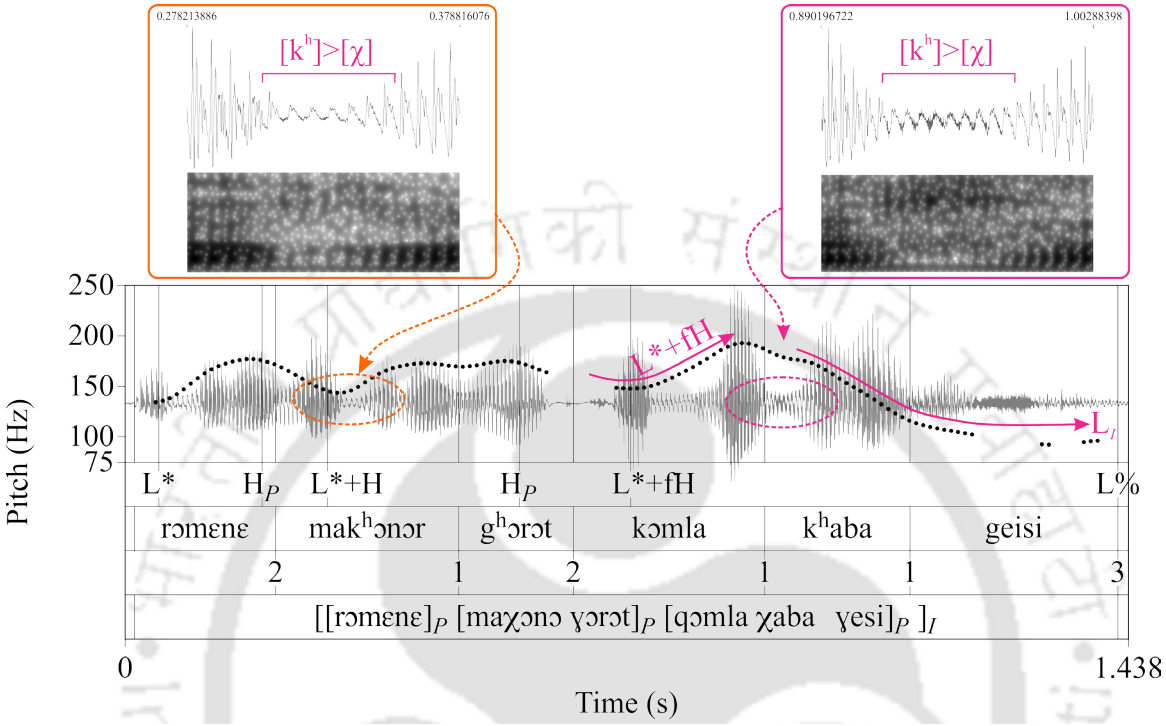


Figure 5-7 Intonational contour of the sentence *rɔmɛnɛ mak^{h}ɔnɔr g^{h}ɔrɔt kɔmla k^{h}aba geisi* (Ramen went to Makhan's house to eat oranges) uttered with CF *kɔmla*.

As it can be seen, in Figure 5-7, the focused constituent *kɔmla* receives L*+fH focus pitch accent, which heads the focus initiated P-phrase *kɔmla k^{h}aba geisi*. Spirantisation of word initial [k^h] of *k^{h}aba* further strengthens the claim that *kɔmla* and *k^{h}aba* belong to the same phonological domain, which prepares an intervocalic atmosphere to [k^h] across two words. In the fourth tier of Figure 5-7, phrase internal segmental changes have been reported. In the Figure, the displayed zoomed-in spectrograms of [k^h] realisation in *mak^{h}ɔnɔr* and *kɔmla k^{h}aba* from left to right demonstrate spirantisation.

The word initial [k^h], which is retained in (7), is pronounced as a fricative [χ] in (8). In the third tier of Figure 5-7, the boundary between *kɔmla* and *k^{h}aba* is a P-word boundary, whereas in Figure 5-6 it was a P-phrase boundary denominated by number 1 and 2 respectively.

5.2.3.3 Intervocalic Stop Lenition

In NVA, intervocalic stops are produced as lenis compared to when they occur word initially. In (9), some words have been given which demonstrate how within the P-word domain, plosives may undergo lenition when an intervocalic environment is provided. However, if the syllable in which they occur are assigned prosodic prominence, they do not undergo the said lenition[34].

9)	/nɔgɛn/	→	/nɔɣɛn/	'proper noun'
	/tɔka/	→	/tɔɣa/	'rupee'
	/sabipat/	→	/saβip$^{\upsilon}$at/	'the key'

In (10), the prosodic structure of the sentence *rɔmɛnɛ nɔgɛnɔk mana kɔillak* uttered in WF condition has been given as an example.

	L* H_P	L* H_P	L*H_P	H* L_I	
10)	[[rɔmɛn-ɛ]$_P$	[nɔgɛn-ɔk]$_P$	[mana]$_P$	[kɔil-lak]$_P$]$_I$	
	Ramen-NOM	Nagen-ACC	forbid	do-PST3	
	Ramen forbade Nagen				

In (10), each of the non-final P-phrases are designated by L*H_P pitch pattern, and the final P-phrase is marked by H*L_I tonal specification. In Figure 5-8, the pitch track illustrating (10) as per ToBI conventions has been presented.

[34] Blocking of intervocalic stop lenition will be discussed in details while comparing CF marking in SCA and NVA.

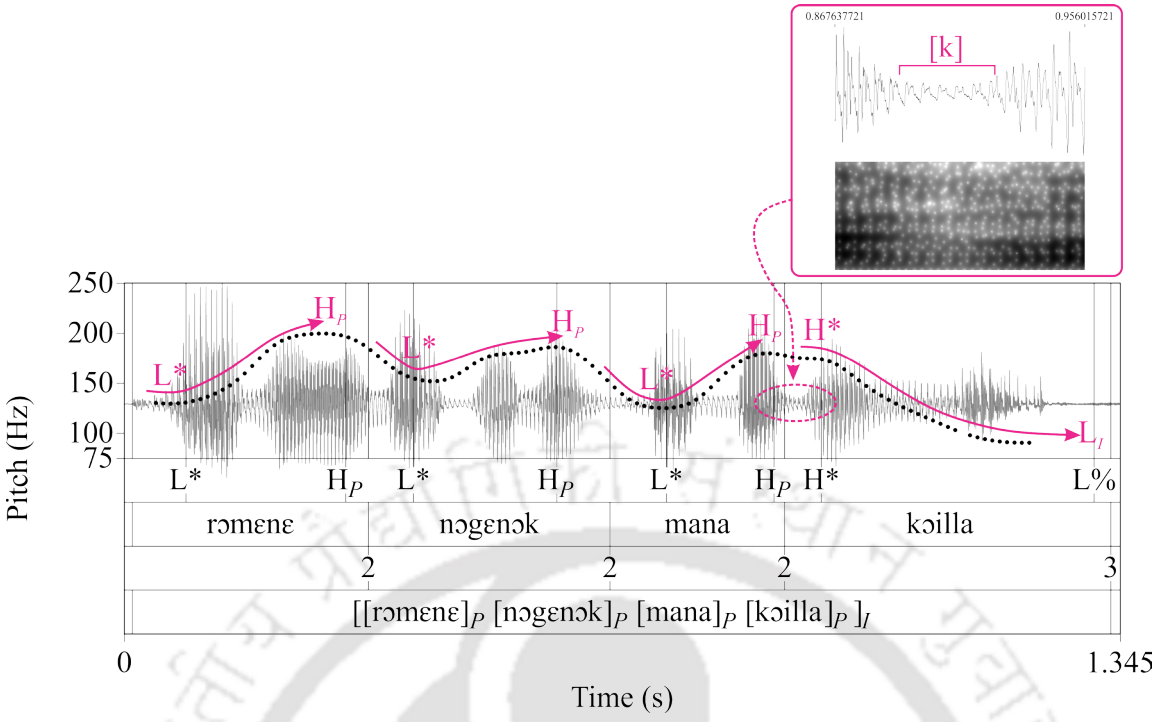


Figure 5-8 Intonational contour of the sentence *rɔmɛnɛ nɔgɛnɔk mana kɔillak* (Ramen forbade Nagen) in WF context.

The final constituent *kɔillak* bears the IP final pitch accent H*, and as per the proposal in this work (see chapter 3), it constitutes a P-phrase designated by H*L$_I$ pitch pattern. This claim is also supported by segmental processes. For instance, in (10) the word initial [k] of the verb *kɔillak* does not undergo intervocalic lenition since it is separated from the final vowel of *mana* by P-phrase boundary (Figure 5-8).

Now let us have a look at utterance (11), which illustrates the post-lexical prosodic structure of the sentence *rɔmɛnɛ nɔgɛnɔk mana kɔillak* with intonational specifications. The sentence is uttered with CF on *mana*.

	L*+H	H$_P$	L*+fH	L$_I$
11)	[[rɔmɛn-ɛ	nɔgɛn-ɔk]$_P$	[**mana**	ɣɔil-lak]$_P$]$_I$

Here, *mana* constitutes P-phrase together with *kɔillak* which removes the prosodic boundary between the two P-words. As a result, the word initial /k/ of *kɔillak* is provided with an intervocalic atmosphere, which compels it to undergo lenition (/k/ → [ɣ]).

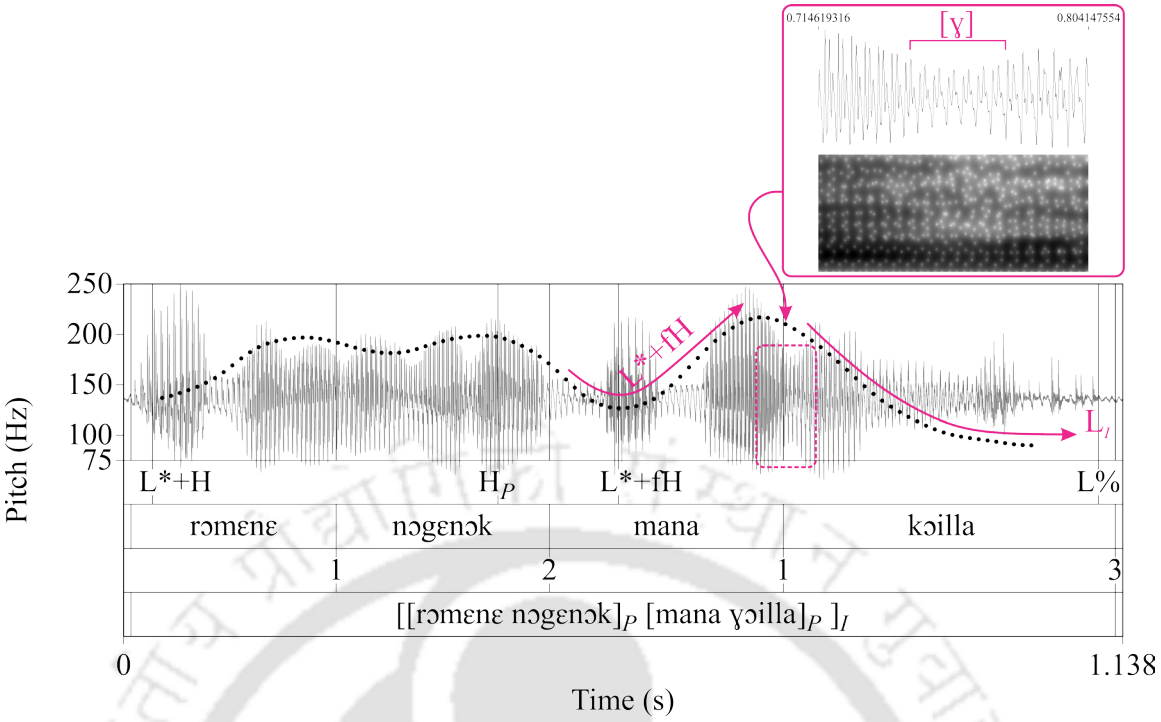


Figure 5-9 Intonational contour of the sentence *rɔmɛnɛ nɔgɛnɔk mana kɔillak* (Ramen forbade Nagen) with CF on *mana*.

Figure 5-9 represents the intonational contour of the utterance given in (11). Here the rise on *mana* is caused by the bitonal focus accent L*+fH; although the high tone seems to align with the right edge of *mana*, it is in fact the high trailing tone of CF pitch accent. In the Figure, it has been displayed how, placed in intervocalic environment across P-word boundaries, the word initial /k/ is produced as /ɣ/. This confirms that CF induced P-phrase *mana kɔillak* constitutes a consolidated phonological domain.

Apart from the segmental processes of /r/ assimilation, aspirate spirantisation and stop lenition, we also see processes of voicing assimilation and flapping taking place within the CF initiated phonological domain. If we again consider (5), produced again in (12), we notice that the constituent *dilak* carrying IP final pitch accent forms a separate phonological domain from the preceding constituent. This does not allow the word initial [d] of *dilak* to exercise any voicing effect on the word final [k] of *milɔnɔk*. In normal circumstances, if a coda [k] of a syllable is immediately followed by an onset [d] of another syllable, [k] is phonetically produced as its voiced counterpart [g][35]. This process of

[35] In both SCA and NVA, we have words like *talukdar* 'a family title' where the voiceless velar [k] undergoes voicing assimilation and is produced as [g] under the influence of the following voiced alveolar [d].

assimilation is blocked across *milɔnɔk* and *dilak* in (12) since both constituents form separate P-phrases. Now if we consider all the CF variants of the sentence *rɔmɛnɛ dɔrzar sabipat milɔnɔk dilak* (13, 14 and 15), the word final [k] of *milɔnɔk* may optionally be produced as [g] establishing the focus induced domain as a phonological domain.

12)	[[rɔmɛnɛ]$_P$	[dɔrzar [s]	sabipat]$_P$ [t]	[milɔnɔk]$_P$ [k]	[dilak]$_P$]$_I$
13)	[[rɔmɛnɛ]$_P$	[dɔrzar [s]	sabipat]$_P$ [t]	[**milɔnɔk** [g]	dilak]$_P$]$_I$
14)	[[rɔmɛnɛ]$_P$	[dɔrzar]$_P$	[**sabipat** [ɾ]	milɔnɔk [g]	dilak]$_P$]$_I$
15)	[[rɔmɛnɛ]$_P$	[**dɔrzar** [s]	sabipat [ɾ]	milɔnɔk [g]	dilak]$_P$]$_I$

Moreover, we see the word final /t/ of *sabipat* is produced as a flap [ɾ] under the influence of the following /m/ in utterances (14 and 15), where the focus is either on *sabipat* or any constituent before it (see Figure 5-4 & 5-5). This kind of flap formation is blocked in (12) and (13) where [t] occurs P-phrase finally.

In this section, we have demonstrated how CF generates P-phrase domain taking the focused constituent and the post-focus tail together. Within this domain, different phonologically bound segmental processes like /r/ assimilation, spirantisation, voicing assimilation and flap formation take place across P-word boundaries. In the next section, we discuss how NVA treats the sequence preceding focused constituent.

5.2.4 Pre-focus constituent

In CF utterances pre-focus constituents show an inclination to behave as a single prosodic domain. This domain, similar to the focused domain, is motivated by intonational patterns as well as different segmental processes occurring within it. Intonationally the constituents within this domain share a single prosodic head (pitch accent) and a boundary tone to their right demarcating a prosodic boundary. Further, the segmental processes discussed in the previous sections are allowed within this prosodic domain across P-word boundaries. In the following section, out of the above mentioned phonological processes only spirantisation is discussed.

The intervocalic spirantisation of aspirated plosives has been reported in the previous section that takes place within a P-phrase domain. Now if we consider utterances

(16) and (17), we see CF initiates a P-phrase taking the pre-focus constituents together in (17) which is not seen in (16).

	L* H_P	L* H_P	L* H_P	H* L_I
16)	[[rɔmɛn-ɛ]$_P$	[k^hɔgɛn-ɔk]$_P$	[mait-pa]$_P$	[ge-isi]$_P$]$_I$
	Ramen-NOM	Khagen-ACC	call-PRF	go-PST3

Ramen went to call Khagen.

	L*+H	H_P	L*+fH	L_I
17)	[[rɔmɛn-ɛ	k^hɔgɛn-ɔk]$_P$	[**mait-pa**	ge-isi]$_P$]$_I$

In (16), which is a WF declarative IP, each of the preverbal constituents forms P-phrase designated by L*H_P pitch configuration, and the final constituent is specified with H*L_I pitch pattern. The intonational pitch contour of the IP has been demonstrated in Figure 5-10 below.

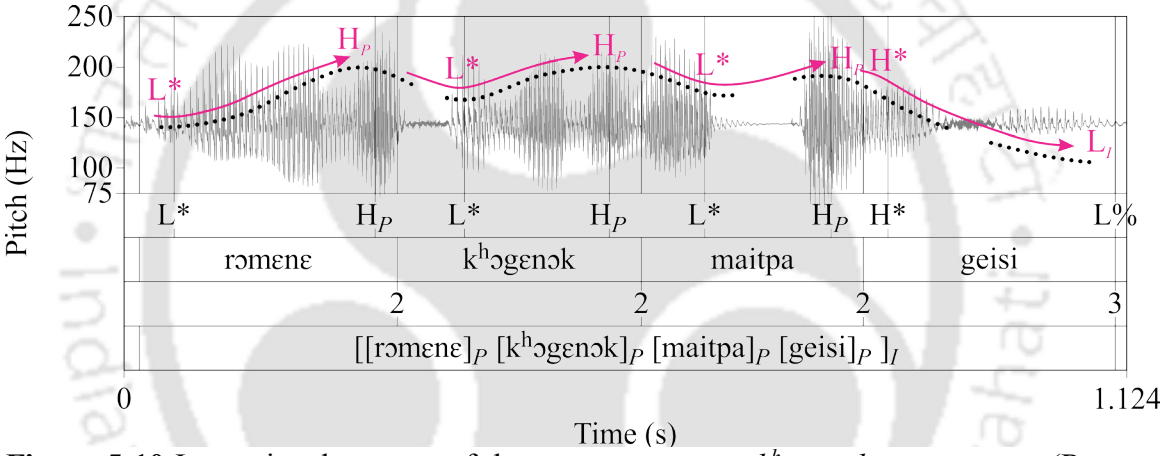


Figure 5-10 Intonational contour of the sentence *rɔmɛnɛ k^hɔgɛnɔk maitpa geisi* (Ramen went to call Khagen) in WF context.

The pitch contour in the above diagram shows how non-final P-phrases exhibit repeated rising contours, whereas the final P-phrase displays a falling trajectory. The IP final pitch accent H* is realized on *geisi* 'go-PST3', which is the main verb of the IP, and the non-final P-phrases, *rɔmɛnɛ*, *k^hɔgɛnɔk* and *maitpa* receive a pitch accent and a boundary tone on each.

Now if we proceed to the prosodic phrasing pattern given in (17), which is uttered with CF on *maitpa*, the two pre-focus constituents: *rɔmɛnɛ* and *k^hɔgɛnɔk* are produced as a single prosodic phrase *rɔmɛnɛ k^hɔgɛnɔk*.

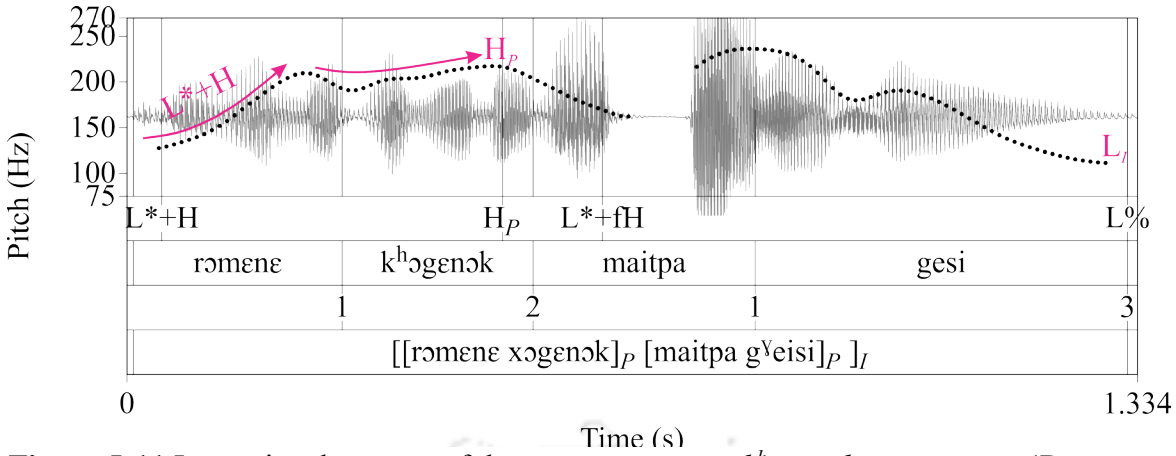


Figure 5-11 Intonational contour of the sentence *rɔmɛnɛ k^{h}ɔgɛnɔk maitpa geisi* 'Ramen went to call Khagen' with CF on *maitpa*.

Figure 5-11, which intonationally represents (17), displays how the two pre-focus constituents are demarcated by a boundary tone (H_P) to their right and a pitch accent (L*+H) on the first syllable *rɔ* of *rɔmɛnɛ*. This prosodic phrasing is also supported by segmental evidence, which has been reported in the fourth tier in Figure 5-11. For instance, the absence of phrase level prosodic boundary between *rɔmɛnɛ* and *k^{h}ɔgɛnɔk* is evident from the fricativised production of [k^h] as [x]. Due to the lack of strong prosodic boundary, [k^h] is placed in an intervocalic surrounding across two P-words which spirantises it; this process is blocked in (16).

Thus we see that constituents preceding CF nucleus (as it is in (11) and (17)) tend to behave as a unified prosodic domain, which bears both phonological and intonational characteristics. In our recorded data, we came across CF utterances where the pre-focus P-phrase contained as many as three P-words in it. Sentence (18) is produced with CF on *mak^{h}ɔn* where the entire pre-focus sequence behaves as a single P-phrase. The intonational pattern and P-phrase internal segmental changes have been demonstrated in Figure 5-13.

	L*+H		H$_P$	L*+fH			L$_I$
18)	[[mad^{h}ɔb-ɛ	k^{h}ɔgɛn-ɔr	g^{h}ɔr-ɔt]$_P$	[**mak^{h}ɔn**$_F$	k^{h}a-ba	ge-isi]$_P$	]$_I$
		[x]	[ɣ]	[x]	[x]	[ɣ]	
	Madhab-NOM	Khagen-GEN	house-DAT	butter	eat-PRF	go-PST3	

Madhab went to Khagen's house to eat butter.

The complete sequence preceding the CF pitch accent: *mad^{h}ɔbɛ k^{h}ɔgɛnɔr g^{h}ɔr-ɔt* is uttered as a single P-phrase. This phrase has a single prosodic head (L*+H) and boundary tone (H_P), and within this domain spirantisation is allowed across P-word boundaries.

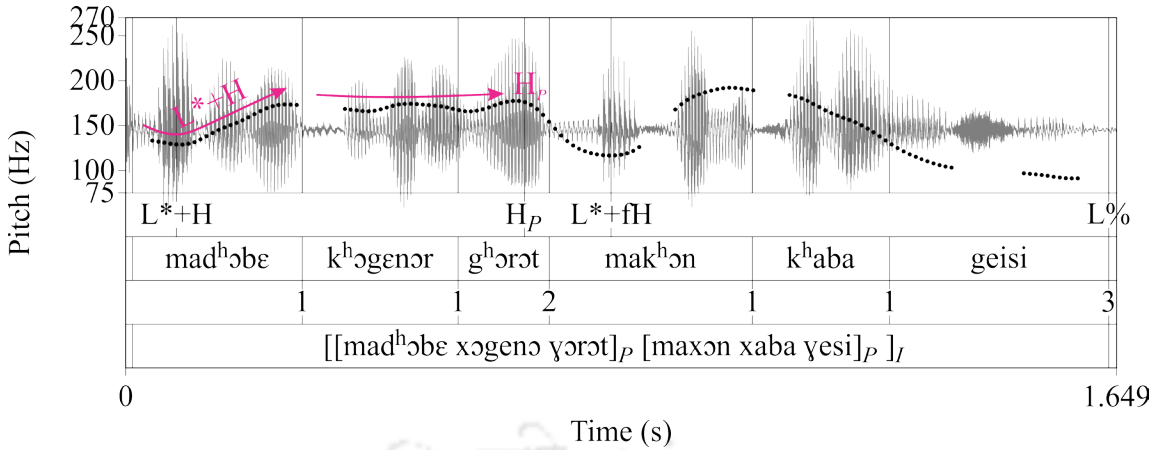


Figure 5-12 Intonational contour of the sentence *mad^{h}ɔbɛ k^{h}ɔgɛnɔr g^{h}ɔrɔt* ***mak^{h}ɔn*** *khaba geisi* 'Madhab went to Khagen's house to eat butter' with CF on *mak^{h}ɔn*.

In Figure 5-12, the pre-focus sequence demonstrates a rise and a subsequent plateau, which continues until the right edge of the sequence. The first syllable *ma* of *mad^{h}ɔbɛ* bears the low starred tone of L*+H pitch accent and the trailing high tone is realised on the third syllable; the high boundary tone H$_P$ gets associated with the final syllable of the phrase.

However, with the increase in the number of constituents in the IP, this pre-focus prosodic phrasing may not hold. With longer strings of IP, the phrasing among pre-focus constituents fall back to their default phrasing pattern.

If we consider utterance (13), reproduced below in (19), we see that the pre-focus prosodic phrasing adheres to syntactic structure.

19) [[rɔmɛnɛ]$_P$ [dɔrzar sabipat]$_P$ [**milɔn-ɔk** dilak]$_P$]$_I$

In (19), where the direct object *milɔnɔk* receives CF, and the pre-focus sequence is parsed into two P-phrases; it is unlike (18) where the entire pre-focus string forms a P-phrase. This provided the motivation in the present work to conclude that in NVA pre-focus phrasing is not obligatory. Although the variety exhibits a tendency towards forming P-phrases out of the pre-focus constituents, with longer strings of constituents in the IP domain such phrasing may not be materialized.

5.2.5 Summary

In this section, CF marking in NVA, and the various cues, intonational and phonological, that designate a constituent with CF have been studied. They have been summarised in the following table.

Table 5-1 Summary of Intonational marking of CF and prosodic phrasing, and different segmental processes accommodated within prosodic domains in NVA

<table>
<tr><th>Variant</th><th colspan="2">Pre-focus constituents</th><th colspan="2">Focused constituents</th><th colspan="2">Post-focus constituents</th></tr>
<tr><td rowspan="9">NVA</td><td colspan="6">Intonational marking</td></tr>
<tr><td>Pitch Accent</td><td>Boundary tone</td><td>Pitch Accent</td><td>Boundary tone</td><td>Pitch Accent</td><td>Boundary tone</td></tr>
<tr><td>L*
Or
L*+H</td><td>H_P</td><td>L*+fH</td><td>-----</td><td>-----</td><td>L%</td></tr>
<tr><td colspan="6">Prosodic Phrasing</td></tr>
<tr><td colspan="2" rowspan="2">[L*H_P]
Or
[L*+H H_P]</td><td colspan="4">[L*+fH L_I]</td></tr>
<tr><td colspan="2">-----</td><td colspan="2">Dephrased</td></tr>
<tr><td colspan="6">Segmental processes within prosodic domains</td></tr>
<tr><td colspan="6">1) /r/ assimilation
2) intervocalic aspirate spirantisation
3) Intervocalic Stop Lenition
4) voicing assimilation
5) flapping</td></tr>
</table>

A constituent with CF in NVA is signaled by a bitonal focus pitch accent (L*+fH), which is assigned to the first syllable of the constituent. The focused constituent and the sequence following it form a P-phrase, where the focus constituent bears the pitch accent. This implies that CF exercises a dephrasing effect on the constituents following the focused constituent. Further, the pre-focus string in NVA is found constituting a single P-phrase specified by a prosodic head (L*+H) and a boundary tone (H_P). The prosodic domains of

focused and pre-focused constituents are also motivated phonologically by segmental processes like /r/ assimilation, aspirate spirantisation, and intervocalic stop lenition, etc.

5.3 Phonetic cues to CF in NVA

After the discussion on the phonology of CF in NVA in the preceding section, in this section an experiment has been reported which was designed to investigate various phonetic cues to CF such as pitch and duration of pre-focus, focused and post-focus constituents. The experiment is similar to the one reported in chapter 4 which was conducted to observe the phonetic cue to CF in SCA.

5.3.1 Methodology

Since the methodology adopted in this experiment is identical to that of the experiment conducted on CF in SCA data in §4.4 of chapter 4, a detailed description of the same has been skipped. Only two pairs of exemplary sentences have been given below.

20) *The First set of sentences* (WF)

ki ho-l ?
what happen-PST3

a. [[rɔmɛn-ɛ]$_P$ [mula]$_P$ [lo-i aih-la]$_P$]$_I$
Ramen-NOM radish bring-PRF come-PST3
Ramen brought radish.

b. [[rɔmɛn-ɛ]$_P$ [nɔjɔn-ɔk]$_P$ [lo-i aih-la]$_P$]$_I$
Ramen-NOM Nayan-ACC bring-PRF come-PST3
Ramen brought Nayan.

21) *The Second set of sentences* (words with CF are in boldface)

ki? rɔmɛn-ɛ gazɔr lo-i aih-la?
What Ramen-NOM carrot bring-PRF say.PAST3
What? Did Ramen bring carrots

a. [nai nai]$_P$ [rɔmɛn-ɛ]$_P$ [**mula** lo-i aih-la]$_P$]$_I$
no no Ramen-NOM radish bring-PRF come-PST3
No, no, Ramen brought radishes.

b. [nai nai]$_P$ [rɔmɛn-ɛ]$_P$ [**nayan-ɔk** lo-i aih-la]$_P$]$_I$
no no Ramen-NOM Nayan-ACC bring-PRF come-PST3
No, no, Ramen brought Nayan.

The sentences given in (20) and (21) are WF and CF renderings respectively with di- (a) and trisyllabic (b) objects.

5.3.1.1 Subjects

There were 10 (ten) speakers, who were recorded for the current data set. All the speakers were male from the age group of 20 to 30 years, and they belonged to Janigog village of Nalbari district of Assam. The recording took place in a silent atmosphere.

5.3.1.2 Data analysis

Data analysis and the statistical significance test adopted in the present experiment is different from the previous experiment undertaken on SCA (§4.4). Since the data size and format are different in the current experiment, and only one iteration was considered for each token, a one-way ANOVA test was conducted on the present data. In the test, pitch and duration values were dependent variables and word length and focus status were fixed factors, and speakers are random factors. There were 4 disyllabic and 3 trisyllabic words in the investigation uttered by ten speakers. Total data size for the experiment is of [7 (expressions) x 10 (speakers) x 2 (focus conditions)] 140 utterances with 80 (eighty) disyllabic and 60 (sixty) trisyllabic focused words.

5.3.2 Findings

In the following subsections, effects of CF on pre-focus, focused and post-focus constituents in NVA have been illustrated with the help of the findings in the current experiment. The first section reports the pitch values of pre-focused and focused constituents in the recorded sentences and the second section discusses the durational change CF brings about in NVA.

5.3.2.1 Pitch

In order to get a better idea about the effect of CF on the focused constituent and its surrounding constituents, one can go through Figure 5-13 and 5-14, which demonstrate comparative contours of WF and CF utterances. In Figure 5-13, the focused constituent is disyllabic, whereas in Figure 5-14, the constituent is trisyllabic.

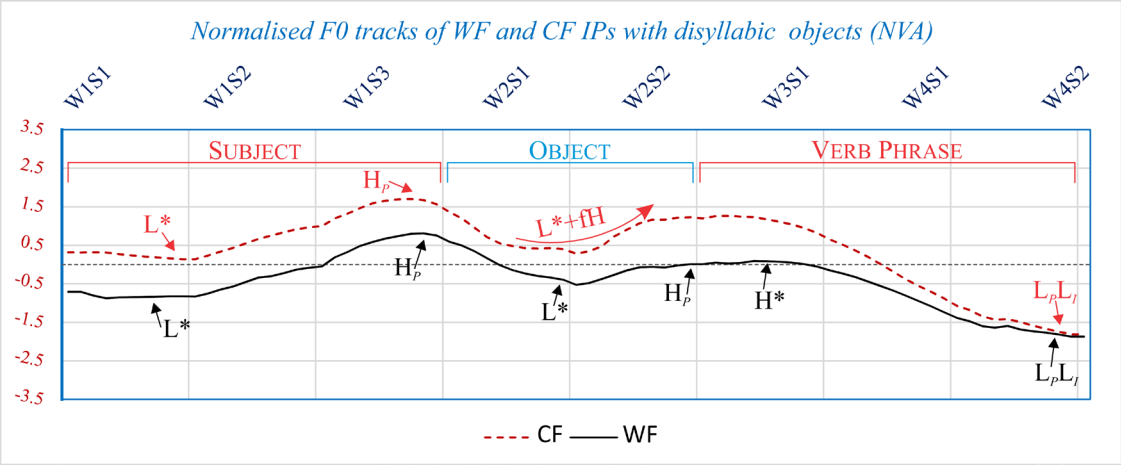


Figure 5-13 Normalised pitch contours of identical NVA sentences in WF and CF conditions. The black solid line represents WF utterances and the red dashed line represents the same sentences uttered with CF on the disyllabic object.

As it has already been proposed in chapter 3, in Figure 5-13 it can be seen that the WF declarative IP contour (black solid line) has H* pitch accent on the first syllable of the final constituent, which is here the verb phrase of the IP. The non-final P-phrases: the subject and the object demonstrate rising contours with L*H$_P$ pitch specifications. In case of the CF contour (red dashed line), the final pitch accent is realised on the first syllable of the focused constituent i.e. the object. Here the CF induced pitch accent is a bitonal one (L*+fH) which is the prosodic head of the final P-phrase comprising the sequence of focused and post-focus constituents.

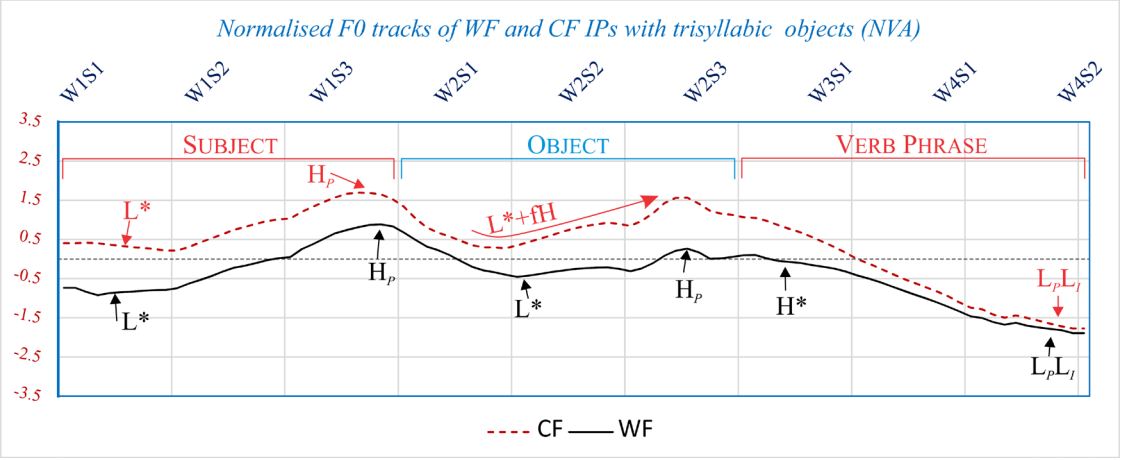


Figure 5-14 Normalised pitch contours of identical NVA sentences in WF and CF conditions. The black solid line represents WF utterances and the red dashed line represents the same sentences uttered with CF on the trisyllabic object.

Figure 5-14 instantiates a picture similar to the one demonstrated in Figure 5-13. The object, being the focused constituent, constitutes P-phrase together with the sequence of constituents following it (represented by the red dashed line). As such it receives the bitonal CF pitch accent L*+fH on its first syllable: the starred tone is realised on the initial syllable and the trailing high tone slurs over the next two syllables. In Figure 5-14, the H* pitch accent of the final P-phrase seen in the WF contour (black solid line) is absent in the CF pitch track.

In the next few sub-sections, pitch measurements on pre-focus and focused constituents in the current experiment will be illustrated.

5.3.2.1.1 F_0 values of pre-focus constituent (NVA)

As is seen in Figure 5-13 and 5-14, Table 5-1 demonstrates higher pitch values: increased F_0 min and F_0 max. In case of IPs with disyllabic focused words, F0 min [$p<0.05$, $F(1, 78) = 59.56$, $p=0.00$] and F0 max [$p<0.05$, $F(1, 78) = 196.03$, $p=0.00$] values are significantly greater than the WF contour. The trend is not different in case of IPs with trisyllabic focused words: F0 min [$p<0.05$, $F(1, 58) = 76.20$, $p=0.00$] and F0 max [$p<0.05$, $F(1, 58) = 193.47$, $p=0.00$]. Interestingly, even if pre-focus constituents experience an increase in pitch values, their pitch span remains the same: in disyllabic words [$p>0.05$, $F(1, 78) = 0.99$, $p=0.32$] and in trisyllabic words [$p>0.05$, $F(1, 58) = 3.40$, $p=0.07$].

Table 5-2 Comparison of pitch values of NVA pre-focus constituents in (di- and tri-syllabic) CF and WF conditions.

Pre-focus Constituent (NVA)

Category	Variables	WF		CF		F	p-value
		Mean	SD	Mean	SD		
Disyllabic focus	F_0 max	.81	.58	1.7	.43	(1, 78) = 59.56	0.00
	F_0 min	-.87	.3	.13	.35	(1, 78) = 196.03	0.00
	F_0 range	1.69	.53	1.57	.57	(1, 78) = 0.99	0.32
Trisyllabic focus	F_0 max	.27	.61	1.56	.54	(1, 58) = 76.20	0.00
	F_0 min	-.92	.26	.21	.37	(1, 58) = 193.47	0.00
	F_0 range	1.81	.78	1.48	.59	(1, 58) = 3.40	0.07

5.3.2.1.2 F_0 values of focused constituent (NVA)

In Table 5-2, pitch values on the focused constituent have been reported. In Figure 5-13 and 5-14, we have seen how the CF pitch contour is realised higher than the WF one; the results given in Table 5-2 support this trend. Apart from greater the F_0 min and max values of CF constituents in both di- and trisyllabic focused words, the F_0 range in the said constituent is significantly greater than its WF realisation. In disyllabic focused words it is [$p<0.05$, $F(1, 78) = 16.35$, $p=0.00$], and in trisyllabic words [$p<0.05$, $F(1, 58) = 19.12$, $p=0.00$]. Thus the results of the experiments show that constituents with CF in NVA are characterised by pitch range expansion.

Table 5-3 Comparison of pitch values of NVA focused constituents in (di- and tri-syllabic) CF and WF conditions.

Focused Constituent (NVA)

Category	Variables	WF		CF		F	p-value
		Mean	SD	Mean	SD		
Disyllabic focus	F_0 max	.01	.3	1.23	.52	(1, 78) = 165.16	0.00
	F_0 min	-.53	.30	.28	.36	(1, 78) =117.80	0.00
	F_0 range	.54	.33	.95	.55	(1, 78) = 16.35	0.00
Trisyllabic focus	F_0 max	.27	.61	1.56	.54	(1, 58) = 76.20	0.00
	F_0 min	-.45	.35	.28	.42	(1, 58) = 53.32	0.00
	F_0 range	.72	.52	1.29	.49	(1, 58) = 19.12	0.00

Pitch values have not been reported for NVA post-focus constituents since first syllables in post-focus sequences, though are not characterised by high post-lexical tones, show pitch values greater than their WF realisations. This increased pitch value is caused by the interpolation of pitch from the high focus trailing tone of the CF pitch accent L*+fH to L_I IP boundary tone. Unlike in WF condition, the first syllable in the post CF sequence is not phonologically specified although it has a greater pitch value.

5.3.2.2 Duration

In the subsequent sections, durational values of pre-focused, focused and post-focused constituents have been reported. In the experiment, it has been found that in order to highlight constituents with CF, NVA reduces the length of both pre- and post-focus constituents by significant margin.

5.3.2.2.1 Duration of pre-focused constituent

Durational results of pre-focus constituents measured in the experiment have been reported in Table 5-3.

Table 5-4 Comparison of duration values of NVA pre-focus constituents in (di- and tri-syllabic) CF and WF conditions

Pre-focus Constituent (NVA)

Category	Variables	WF		CF		F	p-value
		Mean	SD	Mean	SD		
Disyllabic focus	Duration	.50	.65	-.24	.90	(1, 78) = 18.02	0.00
Trisyllabic focus	Duration	-.22	.76	-.69	.10	(1, 58) = 4.25	0.04

Pre-focus constituents show a significant durational reduction compared to when they occur in WF context. As seen in Table 5-3, this reduction is significant for constituents occurring before both disyllabic [$p<0.05$, $F(1, 78) = 18.02$, $p=0.00$] and trisyllabic [$p<0.05$, $F(1, 58) = 4.25$, $p=0.04$] focus words.

5.3.2.2.2 Duration of focused constituent

Table 5-4 contains duration values of experimented NVA di- and trisyllabic constituents in WF and CF conditions. Interestingly, unlike in SCA, NVA focused constituents do not show durational increase of the focused constituent.

Table 5-5 Comparison of duration values of NVA focused constituents in (di- and tri-syllabic) CF and WF conditions

Focused Constituent (NVA)

Category	Variables	WF		CF		F	p-value
		Mean	SD	Mean	SD		
Disyllabic focus	*Object_DUR*	-.32	1.21	-.48	1.21	(1, 78) = 0.37	0.54
Trisyllabic focus	*Object_ DUR*	.89	.53	.96	.52	(1, 58) = 0.29	0.59

When either of di- or trisyllabic words receive CF, it does not bring about significant durational change in the constituents. As can be seen in Figure 5-4, in both disyllabic [$p>0.05$, $F(1, 78) = 0.37$, $p=0.54$] and trisyllabic [$p>0.05$, $F(1, 58) = 0.29$, $p=0.59$] focused words, the p-value is higher than the significance level ($p>0.05$).

5.3.2.2.3 Duration of post-focus constituent (NVA)

In NVA, post-focus sequences in IPs with CF are realised durationally shorter than when they occur in WF context. The findings of the present experiment has been reported in Table 5-5. It has been shown in the table how post focus constituents are realised significantly shorter following disyllabic [$p<0.05$, $F(1, 78) = 25.00$, $p=0.00$] and trisyllabic [$p<0.05$, $F(1, 58) = 6.97$, $p=0.01$] focused constituents.

Table 5-6 Comparison of duration values of NVA post-focus constituents in (di- and tri-syllabic) CF and WF conditions.

Post-focus Constituent (NVA)

Category	Variables	WF		CF		F	p-value
		Mean	SD	Mean	SD		
Disyllabic focus	post-foc_DUR	.60	.66	-.07	.52	(1, 78) = 25.00	0.00
Tri-syllabic focus	post-foc_DUR	-.28	.59	-.68	.58	(1, 58) = 6.97	0.01

This significant reduction in duration value of the post-focus constituents strengthen the claim made earlier in this chapter (see §5.2) that CF dephrases post-focus constituents. It has been proposed here that in WF condition, the verb phrase (henceforth VP) constitutes an independent P-phrase, and when, in the experiment, the immediately pre-verbal constituent (object) receives CF, the VP loses its existence as P-phrase. The VP forms a prosodic domain together with the focused constituent. As a consequence, and as post-focus constituent, the VP undergoes durational reduction. If dephrasing had not been the factor for this reduction in NVA post-focus constituents, the post-focus constituents should not undergo durational decrease. On the contrary, in SCA, post-focus constituents do not show significant durational change since they undergo only complete PRC without compromising their phrasal status.

5.3.3 Summary

In the preceding sections, various effects of CF have been illustrated with the help of the results got from the experiment conducted on CF IPs in NVA. These results assist us to draw the following conclusions. In NVA, IPs with CF constituents in them exhibit an exalted trend line compared to WF pitch contours. As a result, F_0 min and max values in both pre-focus and focused constituents show higher values. However, it is only focused constituents that are characterised by greater pitch range value in comparison with pre-

focus constituents. As far as durational values are concerned, in NVA, focused constituents are not marked by length increase. Durational values of constituents in both CF and WF conditions are not significantly different from each other. Thus, instead of increasing the duration of focused constituents, NVA speakers decrease the duration of the constituents preceding and following the focused constituents. These results place NVA as a separate language variety from SCA, which increases the duration of focused constituents, and do not decrease the duration of constituents surrounding the focused ones.

5.4 Conclusion

The present chapter explores how NVA exploits post-lexical prosody as a means of highlighting information which is uttered in contrast to something that is given in the context. The variety highlights focused constituents with the bitonal focus pitch accent L*+fH, which acts as the prosodic head for the following P-words constributing to the P-phrase initiated by CF. As far as the pre-focus constituents are concerned, the sequence preceding focus tends to behave like a prosodic phrase, which accommodates phonological processes across constituent P-word boundaries. Further, the variety demonstrates post-focus pitch compression which results from post-focus dephrasing.

Chapter 6 Morphological focus marking in SCA

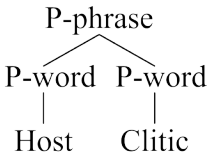
6.1 Introduction

In the previous two chapters, it has been demonstrated how CF materialises in SCA and NVA at the prosodic level, and our claims were supplemented by segmental, intonational and phonetic cues. In the present chapter, the concentration is on the prosody of morphologically marked focus (henceforth MF) constituents in SCA. So far we have seen focus being highlighted only at the prosodic level without any syntactic or morphological evidence. Besides this prosodic marking of focus, SCA and NVA employ morphological focus particles or markers (henceforth MFM) in order to highlight a particular information.

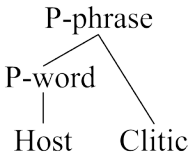
In Assamese, MFMs are clitics which morphologically mark the focused status of a constituent. According to Dixon (2010, p. 221), "a clitic is a surface element part-way between a word and an affix in properties". In traditional grammar a clitic has been described as a "little" word that lacks independent accent; Zwicky (1977) categorised clitics as "bound unaccented morphemes that sometimes are in construction with affixes". This view, however, has been challenged by Anderson (2005) as problematic. According to him (Anderson, 2011), a clitic is a phonological form that is not lexically assigned the status of a P-word. Earlier, Klavans (1995) also demonstrated occurrences of stress or accent assigned to clitics with reference to languages like Greek and Hixkaryana. According to her, clitics may be assigned stress by 1) phonological word rules, 2) intonational rules, or 3) semantic rules; clitics do not always lack stress. Lahiri and Fitzpatrick-Cole (1999) demonstrated how MFMs (they used the term *emphatic clitics*) are associated with prominence in Bengali. They have attributed MFM with an inherent lexical tone, which marks its existence in the prosodic phrasing at the post-lexical level with an H*.

Selkirk (2003) proposes four different types of host-clitic relations that can get realised at the surface level depending upon the phonological preference of languages. These relations can be presented with the help of tree diagrams as given below.

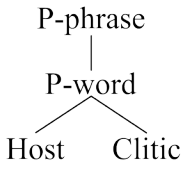
(1) (a) *P-word Clitic*



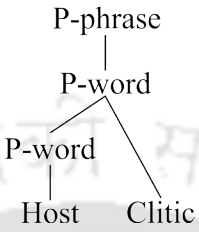
(b) *Free Clitic*



(c) *Internal Clitic*



(d) *Affixal Clitic*



P-word clitics are found in a language where a functional word is prosodised as a P-word (1a), and where the lexical word and functional word are dominated by two separate P-word nodes which are in turn dominated by a P-phrase node. When a clitic is directly dominated by P-phrase node, and functions as sister to the P-word containing its host, it is termed a free clitic (1b). The next type of clitic proposed by Selkirk (2003) is internal clitic (1c), which forms P-words together with its host lexical word. Finally, she talks about affixal clitic (1d) which, similar to internal clitic, is dominated by P-word; however here the lexical word hosting it forms another P-word. She exemplified three Neo-Štokavian dialects of Serbo-Croatian which maintain different host-clitic relations. In her work, Peperkamp (1997) also explicates how Standard Italian, Neapolitan and Lucanian accommodate free clitics, affixal clitics and internal clitics respectively.

SCA demonstrates the presence of question emphatic clitics such as *=nɛ*, inclusive emphatic clitic *=ʊ* (also) and restrictive emphatic clitics such as *=hɛ* (only), *=to* (stresses the host), etc. (Dutta Baruah, 2007), which have been illustrated below with the help of their use in sentences.

(2) tumi bɔzar-ɔloi za-ba=nɛ
you market-DAT go-FUT2=QP
Will you go to market?

(3) rɔmɛn-ɛ nɔgɛn-ɔk mala=ʊ k^{h}uz-il-ɛ
Ramen-NOM Nagen-ACC garland=also ask-PST-3
Ramen asked Nagen also for a garland.

(4) rɔmɛn-ɛ nogɛn-ɔk mala=hɛ k^{h}uz-il-ɛ
Ramen-NOM Nagen-ACC garland=only ask-PST-3
Ramen asked Nagen only for a garland.

In this chapter, however, the discussion will be mainly on *=ʊ* and *=hɛ*. These clitics always attract post-lexical prominence and ascribe prosodic prominence to the constituent hosting them. Assamese MFMs, like Bengali *emphatic clitics*[36] are comparable to English focusing adverbs (henceforth EFAs) which are similar in meaning like *=ʊ* (also), *=hɛ* (only), etc. Like EFAs, MFMs also phonetically highlight the prominence of their arguments. However, unlike MFMs, an EFA 'does not refer directly to focus semantic values' rather it is the context which fixes the 'domain of quantification' (Rooth, 1997).

This chapter has been organised into the following sections. While §6.2 deals with the distribution of MFMs in SCA, §6.3 predicts and characterises the typology of the variety studied. §6.4 illustrates how MFM marked focus is materialised in SCA. After providing phonological evidence in support of the proposed prosodic processes in §6.5, in §6, justification in favor of post-lexical assignment of tone to MFMs is provided. §6.7 reports an experiment conducted to look for phonetic cues to MF in SCA. Finally, §6.8 concludes the chapter with closing remarks on morphological focus marking in SCA.

6.2 Distribution of MFMs

In the data collected for the present study on morphological focus marking, we see MFMs receiving prosodic prominence in terms of high pitch. This dissertation proposes that Assamese MFMs come with an inbuilt prominence drawing nature, and they are always marked by high pitch accent. They, apart from emerging as the most prominent syllable in a P-phrase, represent the informational importance of the argument hosting it (cf. EVAs). However, before going into an elaborate discussion on the post-lexical assignment of accent to MFMs, it is worthwhile to gather some idea about how clitics are distributed and how they prosodically interact with their hosts.

In Assamese, similar to Bengali (Bayer & Lahiri, 1990; Lahiri & Fitzpatrick-Cole, 1999), MFMs adjoin nouns, verbs, adjectives and postpositions. However, there are certain aspects of Assamese which set Assamese MFMs apart from Bengali clitics which will be

[36] See Lahiri and Fitzpatrick-Cole (1999)

discussed in due course. In SCA, although MFMs may be attached to different classes of words (noun, verb, etc.), its host must qualify first as a P-word. For example in (5), we see MFM *=hɛ* can be attached to both inflected (5c) and uninflected (5b) nouns, since both the types of noun qualify as P-words.

(5) a) ((rɔmɛn) *Stem*) *P-word* → Ramen

b) (((rɔmɛn) *Stem*) *P-word* =hɛ) *P-phrase* → Ramen=only

c) ((((rɔmɛn) *Stem*) *P-word* -ɔk) *P-word* =hɛ) *P-phrase* → Ramen-OBJ=only

d) *((((rɔmɛn) *Stem*) *P-word* =hɛ) *P-phrase* -ɔk) *P-word* → Ramen=only-OBJ

While MFMs may follow noun stems, they cannot be followed by inflectional suffixes. We get ungrammatical expressions like (5d) when MFM is placed between noun stem *rɔmɛn* and affix *-ɔk*.

Unlike nouns, verb roots do not constitute P-words; in order to form a P-word, verb root/stem must be followed by an inflectional suffix. It is only after inflectional suffixes are added to verb roots/stems, and they forms P-words, MFMs can be added. This process has been instantiated in (6), where the focus marker *=hɛ* does not get attached to the verb root *kɔr* 'do' directly as the latter is not self-sufficient to constitute a P-word. It is only after the inflectional suffix *-i* adjoins the root, it qualifies as a P-word, and subsequently focus marker *=hɛ* gets attached to it.

(6) a) kɔr → do

b) ((kɔr -i) *Stem*) *P-word* → do-PRF

c) (((kɔr -i) *Stem*) *P-word* =hɛ) *P-phrase* → do-PRF=only

d) *((kɔr =hɛ) *P-phrase* → do=only

When MFM is attached directly to verb roots, we get ungrammatical outputs like (6d), where verb root *kɔr* is followed by MFM *=hɛ*. In Assamese, while an MFM can follow suffixes, the former is never followed by a suffix.

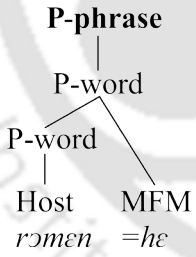
Thus we see that in SCA, MFMs can only be attached to P-words, and such combinations constitute P-phrases. In the next section, while discussing the typology of host=MFM relation maintained in SCA, it will be instantiated how host=MFM combinations are dominated by the higher prosodic node of P-phrase.

6.3 Host=clitic relationship in SCA

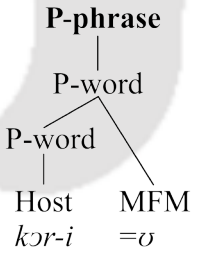
In the present investigation, it has been proposed that MFMs in SCA behave as free clitics. In the studied varieties, realisation of P-word clitic (1a) and Internal clitic (1c) is not possible. Since MFMs in Assamese are always prosodically dependent on their hosts, they cannot be assigned P-word status as shown in (1a). Further, it has already been mentioned in the previous section that MFMs cannot adjoin lexical words directly unless the latter form P-words, this makes (1c) unacceptable in both the varieties.

In SCA, when a P-word is morphologically marked for focus, the entire sequence forms a P-phrase; as such, the host=MFM combination is obligatorily dominated by P-phrase node. Since MFM requires P-word to adjoin, its host must qualify as P-word; here the host P-word and the MFM are sister nodes in the prosodic tree. In (7a), noun stem *rɔmɛn*, which constitutes P-word on its own right, hosts MFM *=hɛ*, in turn both of them are dominated by a P-phrase node. Now if we consider (7b), which demonstrates how verb hosts MFM in SCA, it is seen that *kɔr* derives P-word status after it is inflectionally affixed with non-finite perfective participle *-i* (since verb root *kɔr* lacks P-word status). Subsequently, *kɔr-i* and *=ʊ* together form a P-phrase as sister nodes.

(7) (a) *rɔmɛn=hɛ*
Ramen=only



(b) *kɔr-i =ʊ*
do-PRF=also



In the next section, the intonational aspect of MF will be discussed with reference to its manifestation in SCA. Evidence will be provided, wherever possible, in support of the claim that in SCA, host=MFM combination is immediately dominated by P-phrase node, and the host and the MFM are sister nodes.

6.4 SCA Morphological focus

At the surface level, MFM marked focused constituents are characterised by rising contour; identical to CF marking, the lowest point in the curve aligns with the first syllable and the pitch peak with the final syllable of the focused constituent. However, a careful auditory and pitch track inspection calls for a different phonological explanation for MFM

focus marking to that of CF. In the former case, the pitch peak realised on the final syllable, which is also the only syllable of MFM, exhibits an extra high, obligatorily blocking IP internal declination. In CF, although there is a pitch increase on the final syllable of the focused constituent (compared to its WF occurrence), this increase does not necessarily block the downtrend. This exceptional rise on the MFM motivated the proposal that in MF, it is not the leftmost syllable of the focused constituent that receives the pitch accent, rather it is the MFM that post-lexically qualifies as the most prominent syllable in the focused phrase. In CF condition, the focused constituent demonstrates L*fH$_P$ pitch pattern where the first syllable receives L* pitch accent and the final syllable bears focus high boundary tone fH$_P$. When a constituent is focus marked with an MFM, as it will be established eventually in the chapter, the focused constituent and MFM combination constitutes a P-phrase and exhibits LfH* pitch contour, with low (L) tone realised on the initial syllable and the focus high pitch accent (fH*) on the final syllable of the combination. Here it has been assumed that in SCA, MFMs compete with the initial syllable of their hosts for post-lexical prominence. Since it has been claimed here that MFMs morphologically represent the focus status of their hosts, they emerge as metrically more prominent than the default left-most prominent syllable in the host. As a consequence, they are assigned a high pitch accent H*. Lahiri and Fitzpatrick-Cole (1999) reported similar findings in Bengali; however, they attributed focus enclitics with a pre-specified lexical pitch accent and assigned two pitch accents to the P-phrase induced by focus enclitics: L*H*. Whether the high focus pitch accent (fH*) realised on MFMs in SCA is morpho-lexically or post-lexically assigned is left open in the present study due to lack of evidence.

6.4.1 Methodology

The methodology adopted for collecting data required for this section is similar to the methodology adopted for collecting CF data in Chapter 4 and 5. The exception was only in respect of focus realisation and the set of recorded sentences. In the present set of data, focus is explicitly marked by attaching MFMs to the right edge of constituents focused. As described in the previous chapters, in this chapter also, the speaker rectifies a deliberate mistake committed by the recordist in relation to a particular constituent. This rectification was done by attaching MFMs like *=ʊ* and *=hɛ* to the right edge of the corrected constituents. First (STEP-1) the WF version of the sentences which was uttered by the speaker in response to the question *ki hol?* 'what happened?' was recorded. In response to

a WF rendering by the speaker, the recordist produces the same utterance as a declarative question by replacing a constituent with a different one (STEP-2). Subsequently, the speaker makes the necessary correction by uttering the original sentence once again, but this time with MFM attached to the rectified constituent. In order to observe how MF realisation is prosodically different from CF realisation, equal number of utterances with CF realisations corresponding to those with MF realisations were also recorded (STEP-3).

Given below is an example representative of the schema adopted for data recording. The speaker first produces the sentence *nɔgɛnɛ nɔjɔnɔk mala kʰuzilɛ* (Nagen asked Nayan for a garland) as an answer to the question *ki hol?* Next, in response to the recordist's declarative question asked by replacing *mala* 'garland' by *kʰjɔma* 'forgiveness', the speaker reproduces the sentence by marking the rectified constituent with an MFM: *mala=hɛ*.

STEP-1 →

Recordist:	ki	ho-l ?			
	what	happen-PST3			
	What did happen?				
Speaker:	nɔgɛn-ɛ	nɔjɔn-ɔk	mala	kʰuz-il-ɛ	← **WF**
	Nagen-NOM	Nayan-ACC	garland	ask-PST-3	
	Nagen asked Nayan for a garland.				

STEP-2 →

Recordist:	nɔgɛn-ɛ	nɔjɔn-ɔk	*kʰjɔma*	kʰuz-il-ɛ ?	
	Nagen-NOM	Nayan-ACC	forgiveness	ask-PST-3	
	Nagen asked Nayan for forgiveness?				
Speaker:	nai nai	nɔgɛn-ɛ	nɔjɔn-ɔk	**mala=hɛ**	kʰuz-il-ɛ ← **MF**
	No no	Nagen-NOM	Nayan-ACC	**garland=only**	ask-PST-3
	No no, Nagen asked Nayan only for a garland.				

STEP-3 →

Speaker:	nai nai	nɔgɛn-ɛ	nɔjɔn-ɔk	**mala**	kʰuz-ilɛ ← **CF**
	No no	Nagen-NOM	Nayan-ACC	**garland**	ask-PST3
	No no, Nagen asked Nayan only for a garland.				

The number of base sentences considered for the present chapter was limited to 15 (fifteen); CF and MF expressions were elicited from the speakers. We recorded specimens

with MFMs attached to constituents at different positions in order to observe any variation in focus realisation with regards to positions of the constituents focused.

6.4.1.1 Subjects and recording setting

In this chapter also the data was provided by the same set of speakers (3 (three) male and 2 (two) female), who were considered for SCA data in the previous chapter. Recording instruments and settings are kept identical to the previous experiments.

6.4.1.2 Data analysis and interpretation

Similar to the previous chapter, in this chapter, ToBI conventions (Beckman & Elam, Guidelines for ToBI Labelling, 1997) were adopted for segmentation of data in PRAAT. In the third tier we have included one more boundary 0 for demarcating word=clitic boundary apart from 1, 2 and 3 for P-word, P-phrase and IP boundary respectively.

Taking the cues from the previous chapters on how focused constituents initiates prosodic domains, we have relied on intonational contour as well as segmental cues in order to finalise the characteristics of MF constituents.

6.4.2 Findings

In SCA, when a constituent hosts an MFM to its right, it forms a P-phrase together with the marker. This phrase is designated by a low tone, realised on the first syllable and a high tone, realised on the final syllable i.e. on the MFM. So far we have seen that P-phrases are characterised by pitch accents on their first prominent syllable as the left-most prominent syllable is assigned post-lexical prominence within a P-phrase domain. However, in case of morphological focus marking, we propose that it is not the left-most syllable that emerges as the most prominent syllable in the focus induced P-phrase, rather it is the MFM that surfaces as the optimal candidate to bear the pitch accent. Now the question arises, if the pitch accent falls on the final syllable of the focused phrase, how to phonologically designate the focused phrase initial low? In chapter 4 it has already been shown that in SCA, CF always exercises a phrasing effect on the focused constituent, and consequently, by default it assigns pitch accent to the left-most prominent syllable. However, in case of morphological focus marking, SCA, apart from assigning default pitch accent on the left-most syllable of the focused constituent, marks the focus status with a morphological particle. This particle performs a two-fold function: on the one hand, it morphologically assigns focus status to its host, and on the other hand, it attracts prosodic

prominence post-lexically as a focus marker on behalf of the entire phrase. Thus in a morphologically focused phrase, we get two syllables which are assigned prominence lending tones: one on the first syllable and the other on the final.

We have already seen in chapter 4 that in focus initiated P-phrases, it is the high tone, in the form of focus boundary tone (fH_P) that characterises focused constituent with higher pitch value, and differentiates it from its WF realisation. Further, this focus induced high tone restrains the realisation of further high tones following it. Similarly, morphologically marked constituents demonstrate exceptionally high pitch value on MFMs followed by comprehensive pitch compression. However, unlike CF realisation, MFM marked focus obstructs IP internal F_0 declination pattern. This motivated the claim that MFMs attached to focused constituents bear focus high pitch accent (fH*) on them. Next, it is shown how tonal specifications described above are manifested in MF.

In §6.3, it has been demonstrated how in SCA, MFMs behave as free clitics and form P-phrases together with their hosts. Following this host=clitic relationship, it has been proposed here that the P-phrase constituted by the host=clitic construct is headed by the high pitch accent (H*) realised on MFMs. Thus we get (6).

H*

(8) [P-word=MFM]$_P$

When a constituent hosts an MFM, it makes a contrast to or a correction of something previously uttered in the context. We assume here that the constituent hosting an MFM is essentially a constituent with CF which is attributed with an explicit focus marker. Therefore, we propose that there are two focus marking rules that apply serially, and where the first rule feeds the second rule. The first rule is related to the prosodic demarcation of the focused constituent and the second rule explicates how the MFM is prosodically consolidated with the focused constituent. According to the first rule (9), it has been proposed, a constituent hosting an MFM is prosodically characterised by a low pitch accent (L*) and focus high boundary tone (fH_P)[37]. At this moment, the MFM is separated from its host by a prosodic boundary designated by fH_P.

[37] We have already discussed in §6.2 that host of an MFM is a P-word, and as such it qualifies to form a P-phrase when focused.

(9) *Prosodic marking of focused constituent* [Const.] → L* fH$_P$ [Const.]$_P$ / [[____]=MFM]$_P$

In the next stage, as represented by the second rule (10), the host and the MFM are prosodically consolidated into one P-phrase, and the boundary tone separating them is removed since MFMs can only be hosted by P-words (see (7a) and (7b)).

(10) *Host-MFM consolidation* L* fH$_P$ [[Const.]$_P$=MFM]$_P$ → L* f~~H~~$_P$ H* [Const.=MFM]$_P$ → L fH* [Const.=MFM]$_P$

As a result of this consolidation, the boundary separating the host and the MFM gets deleted and so does the boundary tone (H$_P$). However, the focus feature 'f' does not undergo deletion and gets associated with the high pitch accent realised on the MFM (fH*). Since MFMs are morphological prominence markers for the entire phrase, they emerge as the most prominent syllables within the phrase they occur, and hence receive the starred tone (fH*) of the phrase. As the focused constituent (excluding the MFM) constitutes a P-phrase and is post-lexically assigned with a low pitch accent (L*) prior to the application of rule (10), the low tone realised on its first syllable continues to exist though not as the most prominent syllable of the consolidated focus phrase. In order to address this decline in prominence on the initial syllable, the star from the pitch accent (L*→ L) has been removed from the present representation. Although L loses its star, it does not lose its association with the initial syllable which establishes its existence as pitch accent. It is only for the representational purpose that the star has been removed. Even after the deletion of the star, L fulfills the requirements of being a pitch accent. According to Arvaniti, Ladd and Mennen (2000), "starredness equals association and association equals alignment *relative to* the metrically strong syllable". We get rising contours on MFM marked focused constituents identical to CF induced P-phrases. The intonational configuration of the P-phrases induced by the two types of focus are, however, phonologically different: L*fH$_P$ and LfH* for P-phrases initiated by CF and MF respectively.

The sentences given below instantiate how intonational patterns surface at the IP level under different focus conditions. A metrical grid has been used in order to illustrate the prominence pattern of the focused and non-focused constituents in the sentences. Post-lexically assigned prominence level for each syllable is marked by 'x' symbol in the

sentences. As can be seen in sentence (11), uttered in WF condition, the left-most syllable of each of the pre-verbal constituents is ascribed phrase level prosodic prominence[38].

			L* H_P	L* H_P	L* H_P	L_I	
			x	x	x		
			x x x	x x x	x x	x x x	
(11)	*Wide focus*	→	[nɔgɛn-ɛ]$_P$	[nɔjɔn-ɔk]$_P$	[mala]$_P$	[k^{h}uz-il-ɛ]$_P$]$_I$	
			Nagen-NOM	Nayan-ACC	garland	ask-PST-3	
			Nagen asked Nayan for a garland.				

Sentence (12), which is uttered with CF on *nɔjɔnɔk*, bears the final accent of the IP on the first syllable of the focused constituent. The constituents following CF fail to derive prosodic prominence. For instance, *mala* is assigned prominence on its first syllable in (11), but in (12) it lacks post-lexical prominence.

			L* H_P	L* fH$_P$		L_I	
			x	x			
			x x x	x x x	x x	x x x	
(12)	*CF marking*	→	[[nɔgɛn-ɛ]$_P$	[**nɔjɔn-ɔk**]$_P$	[mala]$_P$	k^{h}uz-il-ɛ]$_I$	

In sentence (13), the focused constituent *nɔjɔnɔk* is morphologically underlined by MFM *=hɛ*, and it forms a P-phrase together with the MFM (*nɔjɔnɔk=hɛ*). In this phrase, after the application of the rules given in (9) and (10), two syllables emerge as post-lexically prominent: word initial *nɔ* and MFM *=hɛ*. Out of these two syllables, the second one is marked prosodically more prominent. Similar to (12), the post-focus sequence lacks prominence.

			L* H_P	L	fH*		L_I	
			x	x	x			
			x x x	x x x	x	x x	x x x	
(13)	*Focus with MFM*	→	[[nɔgɛn-ɛ]$_P$	[**nɔjɔn-ɔk=hɛ**]$_P$	[mala]$_P$	k^{h}uz-ilɛ]$_I$		

[38] In SCA, intonational prominence in an IP is ascribed only at the post-lexical level, and P-phrases are the smallest units with tonal specifications. Therefore, after designating each syllable in the lowest layer of the metrical grid with 'x' mark, in the next layer 'x' mark has been assigned to the most prominent syllable in each of the P-phrases.

In (14) it has been demonstrated how the tonal specifications given in (13) on *nɔjɔnɔk=hɛ* are derived after the serial application of two rules (9) and (10).

L*	fH$_P$	H*		L		fH*	
		x				x	
x		x		x		x	
x	x x	x		x	x x	x	

(14) a) [[nɔjɔn-ɔk]$_P$ =hɛ]$_P$ → b) [nɔjɔn-ɔk=hɛ]$_P$

Thus the above discussion leads us to the conclusion that unlike English, where EFAs, such as *only* and *even* do not provide any prosodic information regarding the focused constituent, in SCA, MFMs not only mark prominence of their hosts morphologically by attaching with them, but also lend prosodic prominence to them by bearing the pitch accent of the focused phrases. In the following section, the prosodic structure of MF has been illustrated with reference to prosodic phrasing and intonation pattern of the utterances which were recorded for this experiment. The contours displayed in the figures below are uttered by RB (female) and AH (male): the figures that have higher upper limit of pitch (400Hz) represent utterances produced by RB and those with lower pitch limit (250 Hz) represent utterances rendered by AH.

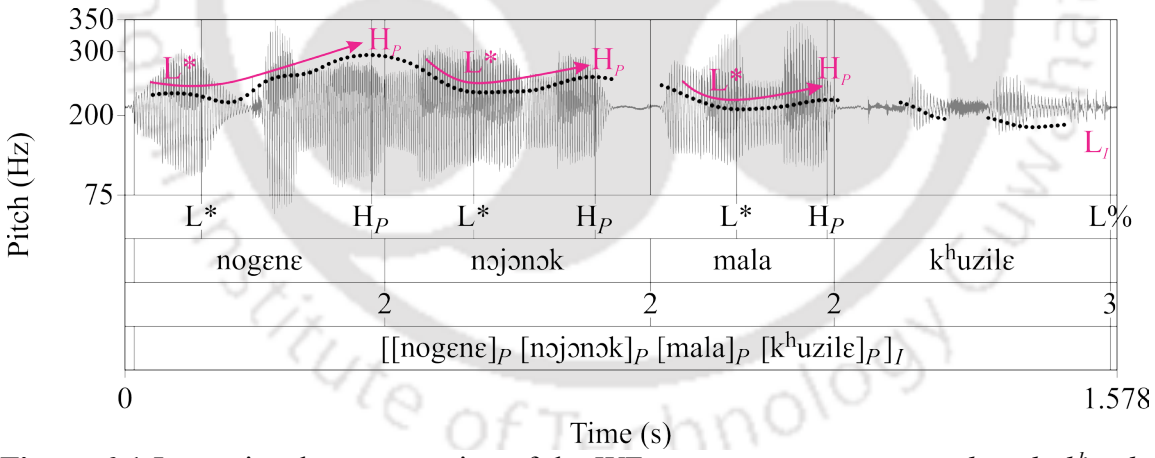


Figure 6-1 Intonational representation of the WF utterance *nɔgɛnɛ nɔjɔnɔk mala k^{h}uzilɛ* 'Nagen asked Nayan for a garland'.

In Figure 6-1, we can see the intonational contour of the sentence *nɔgɛnɛ nɔjɔnɔk mala k^{h}uzilɛ* uttered in WF context; the metrical representation of the utterance has already been given in (11). As can be seen in Figure 6-1, each of the pre-verbal constituents form P-phrase designated by low pitch accent (L*) and high boundary tone (H$_P$). In conformity with the metrical prominence structure illustrated in (11), each P-phrase assigns prominence to its first syllable in terms of pitch accent. Thus we get three P-phrases *nɔgɛnɛ*

nɔjɔnɔk and *mala* which are individually assigned a pitch accent on their first syllable[39], and this pitch accent is post-lexically assigned to P-phrases as a marker metrical prominence.

Now let us see how the metrical prominence of an utterance carrying CF is intonationally manifested. In (12), we have seen how the constituent with CF is the last prosodic constituent which possesses a metrically prominent syllable at prosodic phrase level. In this utterance, *nɔjɔnɔk* receives CF, and it constitutes the last tonally marked prosodic unit; the constituents following it lack post-lexical prominence. Figure 6-2 displays how the metrical structure depicted in (12) intonationally manifests itself.

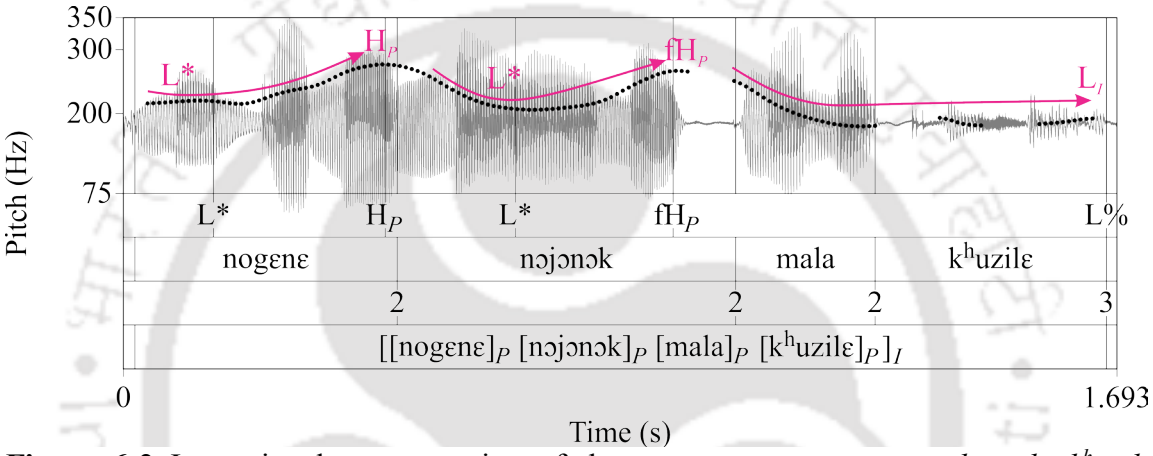


Figure 6-2 Intonational representation of the utterance *nɔgɛnɛ nɔjɔnɔk mala k^{h}uzilɛ* 'Nagen asked Nayan for a garland' uttered with CF on *nɔjɔnɔk*.

In Figure 6-2, as per the metrical structure given in (12), the pitch accent (L*) in *nɔjɔnɔk* is assigned to the metrically prominent syllable *nɔ*. This takes away the post-lexically assigned prosodic prominence of *mala*, which forms a P-phrase in WF context (11). The focused P-word *nɔjɔnɔk* receives the final accent of the IP since it manifests the last major pitch movement in the IP (see chapter 4 for a detailed analysis of CF manifestation in SCA).

Next, in Figure 6-3, the metrical prominence pattern demonstrated in (13) has been illustrated with the help of F_0 contour. Here we see how the focused status of *nɔjɔnɔk* is highlighted at two levels: morphological and prosodic. At the morphological level, the focused constituent is marked by an MFM to its right. As a prosodic marker, the left-most

[39] Although in *nɔgɛnɛ*, the pitch accent seems to fall on the second syllable, it is locally caused by the occurrence of the voiced velar stop /g/ in the second syllable.

syllable of the focused element *nɔjɔnɔk* is assigned with low tone pitch accent (L*) and high focus boundary tone (fH$_P$). When the MFM *=hɛ* is consolidated with the focused constituent and included within the same P-phrase, the boundary tone to the right of the focused constituent gets deleted and the focus feature gets attached to the high pitch accent realised on *=hɛ*. Since *=hɛ* emerges as metrically the most prominent syllable in the P-phrase, and it morphologically represents the focus status of its argument by adjoining it, *=hɛ* surfaces as the most prominent syllable to receive the starred tone of the prosodic phrase. Thus, the MFM *=hɛ* in *nɔjɔnɔk=hɛ*, does not merely highlight *nɔjɔnɔk* morphologically, it prosodically represents its host by receiving the pitch accent of the P-phrase composed of the host=MFM combination *nɔjɔnɔk=hɛ*.

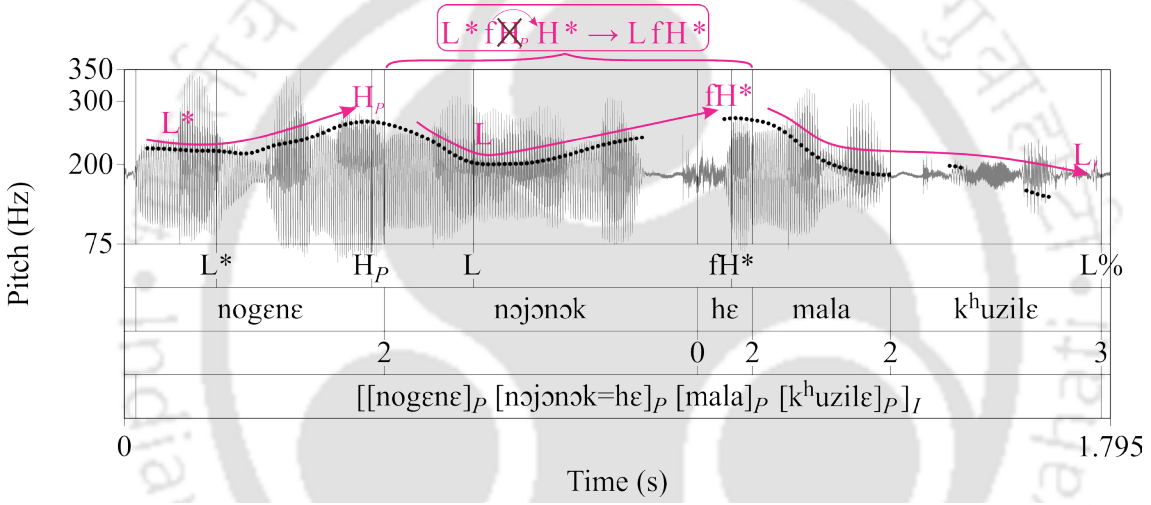


Figure 6-3 Intonational representation of the utterance *nɔgɛnɛ nɔjɔnɔk=hɛ mala k^{h}uzilɛ* 'Nagen asked only Nayan for a garland' uttered with MFM *=hɛ* attached to *nɔjɔnɔk*.

In Figure 6-3, an extra rise on the MFM *=hɛ* can be seen which is absent in the prosodically marked focus (Figure 6-2). By looking at Figure 6-3, we can apparently see that the second peak of the IP realised on *nɔjɔnɔk=hɛ* is higher than that on *nɔgɛnɛ*. We claim that it is the different phrasing pattern of *nɔjɔnɔk=hɛ* that characterises it with an extra rise on the final syllable. Normally, the final syllable of any constituent that aligns with a P-phrase (or a unit larger than a P-phrase) edge gets a boundary tone that demarcates the prosodic boundary of the phrase. In morphologically marked P-phrases, the final syllable is an MFM, which attracts prosodic prominence of the phrase it occurs in. If we take a look at (13) and (14) again, we can see that *=hɛ* is assigned an extra 'x' that marks its prominence in the P-phrase. This 'x' not only makes *=hɛ* more prominent within the P-phrase *nɔjɔnɔk=hɛ*, it becomes the most prominent syllable in the entire IP.

In (15), another example of morphological focus marking has been given where *mala* is focused, and its focused status has been marked morphologically by the inclusive emphatic particle *=ʊ* 'also'. As has been mentioned in our forgoing discussion, MFMs bear the pitch accent (fH*) of focused constituents, and thus *=ʊ* receives the final pitch accent of the IP in (15).

	L* H_P	L* H_P	L	fH*	L_I
(15)	[nɔgɛnɛ]$_P$	[nɔjɔnɔk]$_P$	[mala=ʊ]$_P$	[k^{h}uzilɛ]$_P$]$_I$	

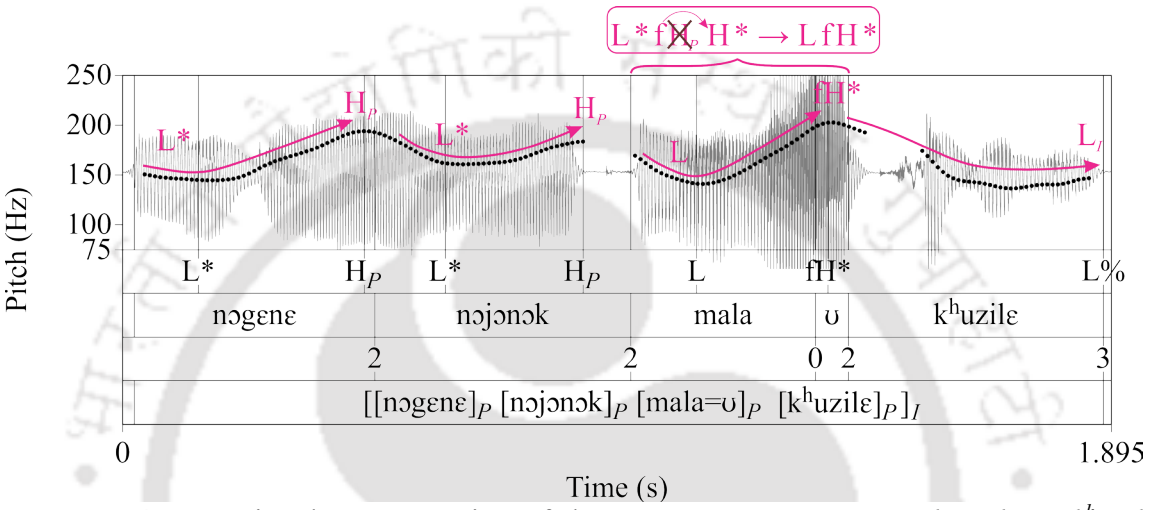


Figure 6-4 Intonational representation of the utterance *nɔgɛnɛ nɔjɔnɔk mala=ʊ k^{h}uzilɛ* 'Nagen asked Nayan for a garland also' uttered with MFM *=ʊ* (also) attached to *mala*.

Figure 6-4, where the intonational contour of (15) has been displayed, demonstrates an exceptional rise on *mala=ʊ* which blocks the IP internal declination. It can be seen that the rise on *nɔjɔnɔk* is lower than that on *nɔgɛnɛ*; on the other hand, the rise on *mala=ʊ* maintains the highest value in the entire IP. The remarkable rise on *=ʊ* hints towards its metrical prominence in the P-phrase it occurs, and also in the IP.

In this way, the preceding discussion provides the motivation to concede that constituents with MFMs maintain similarities with prosodically marked CF. In both the focus realisations, the focused constituent initiates a prosodic phrase that displays a rising contour: the lowest and the highest points in the contour align with the leftmost prominent and the last syllable of the focus initiated P-phrase. This P-phrase is followed by a complete pitch compression through the post-focus sequence. However, there are certain differences between the two focus realisations that designate them as two phonologically distinct focus categories. In SCA, CF solely relies on prosodic means in order to highlight the focused constituent, whereas the other type of focus realisation (MF) incorporates

MFMs in order to highlight focused constituents, besides employing prosodic means. The second distinction is related to the prominence pattern within the focus phrase. It is the leftmost syllable that is metrically the most prominent syllable in P-phrases initiated by CF, however in MFM induced focus, the MFM is graded as the most prominent syllable in focus generated phrases. Thirdly, constituents that receive CF are assigned a phrase initial low pitch accent (L*), while for the other category of focus (MF) a high pitch accent is assigned to MFMs (fH*) besides assigning an initial L pitch accent. Finally, the focus feature that induces a complete PRC on post-focused constituents is assigned to the high boundary tone (fH_P) of constituents with CF, whereas in MFM adjoined focus, the feature gets associated with the high focus pitch accent on MFMs (fH*).

6.5 Focus high tone on MFMs

Cross-linguistically the high tone realised on MFMs has been treated and interpreted differently by different phonologists. It may be interpreted as either a focus high boundary tone as has been claimed for Bangladeshi Standard Bengali (henceforth BSB) by Khan (2008; 2014) or an MFM inherent lexical tone as Lahiri and Fitzpatrick-Cole (1999) proposed for Kolkata Bengali. Khan proposed that a constituent that hosts focus enclitic forms an accentual phrase (henceforth AP), which is characterised by *focused smooth rise (L*...fHa)*. According to him, high pitch value on focus enclitic is caused due to the manifestation of focus initiated AP boundary tone. His proposal entails that in BSB focus enclitic is not assigned tone at the lexical level, though it may bear an intonationally assigned tone. In the example given in Figure 6-5, we see how *monoaɹa=j* (Monoara=only), which is encliticised for focus, is characterised by *focused smooth rise (L*...fHa)* contour.

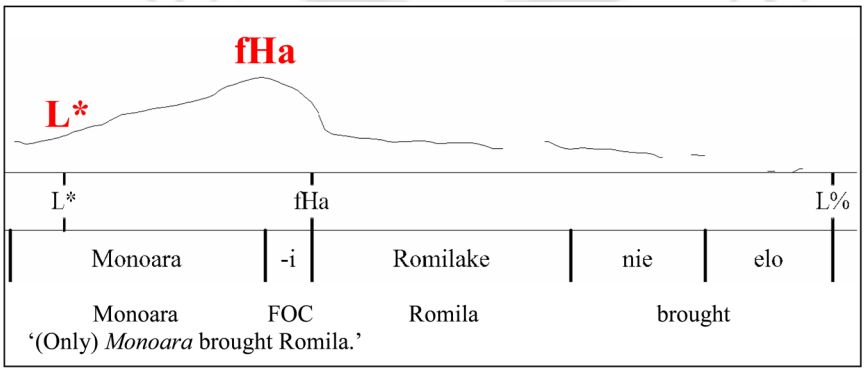


Figure 6-5 The focus-encliticised AP [monoaɹaj] 'only Monoara' bears a focused smooth rise tonal pattern, composed of a low pitch accent (L*) and extra-high AP boundary tone (fHa), and is followed by post-focal tone deletion. Extracted from Khan *(2008, p. 222)*.

Lahiri and Fitzpatrick-Cole (1999)(henceforth L&F), on the other hand claims that in Kolkata Bengali, emphatic enclitic comes with lexical high tone. This lexical high tone receives a pitch accent at the intonational level as well leaving the focused constituent with two starred tones (L*H*). Extracted from L&F, the utterance in (28) (adopted from L&F (1999, p. 134)) bears MF on *dæor-er=o* explicitly indicated by Bengali emphatic clitic *=o* (too). As shown in Figure 6-6, the focused constituent including the emphatic clitic *=o* constitutes a P-phrase, which is characterised by two pitch accents L* and H*. The authors propose that H* realised on *=o* is not supplied post-lexically, rather it is inherent in *=o*, and in all Bengali emphatic clitics for that matter.

(16) L H L_I
(didi-r **dœor-erÛo** dZonno upohAr kin-e-tSÓ-i.)$_I$
'I bought a present for sister's **brother-in-law**, too.'
(Presupposition: I bought a present for sister's *x* , *x* ≠ brother-in-law.)

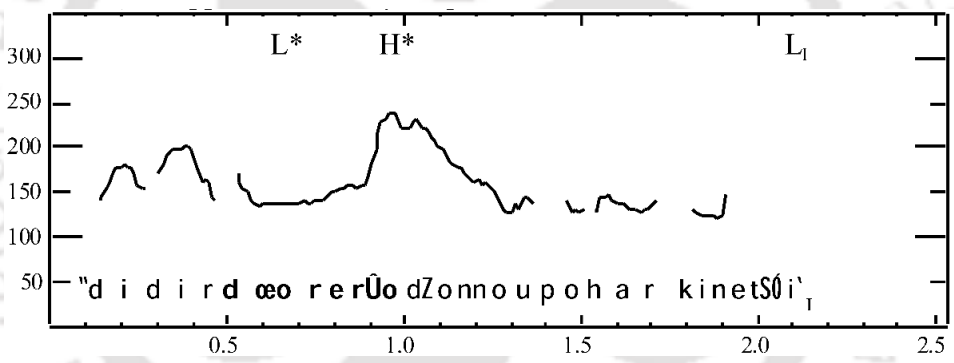


Figure 6-6 Intonational contour of the utterance *didir dæorer=o dzonno upohar kinetʃʰi* (I bought a present for sister's **brother-in-law**, too) bearing MF on *dæorer* (brother-in-law's). The figure has been cropped from L&P *(1999, p. 134)*.

However, in the present study, different explanations have been provided for the high tone realised on the focused constituent in Assamese varieties. In SCA, focused constituents form P-phrases, but we have avoided claiming the high tone of the constituent a boundary tone, since its realisation obligatorily blocks IP internal downstep. In chapter 4, we have seen how prosodic boundaries do not necessarily block downstep in SCA. Therefore, a different prosodic phrasing has been proposed for MF constituents which can address this blocking of downstep within IPs with MF. Unlike other P-phrases, where post-lexical prominence is assigned to the left-most prominent syllable of the phrase, MFM induced P-phrases are intonationally assigned prominence on their final syllable i.e. on

MFMs. In §6.4 it has been discussed in detail how in SCA, MFMs are post-lexically assigned pitch accents.

In the present study, it has been assumed that the starred tone (H*) on MFMs in SCA is attributed to them as a marker of post-lexical prominence and not for some phonological prominence intrinsic within them. Whenever MFMs adjoin other constituents, they lend informational prominence to them by prosodically and intonationally representing it. It is held in this chapter that when constituents are explicitly marked by morphological particles (MFMs) at the post-lexical level, apart from standing as overt morphological markers of prominence to the former, the latter attribute prosodic prominence to their hosts by receiving the prominence lending high focus pitch accent fH*.

6.6 Phonological evidence

Our proposal for two different types of phonological representation for SCA is motivated by both intonational and segmental evidence. Both types of evidence are produced below with reference to MF manifestation in SCA.

As far as intonational cues are concerned, SCA exhibits similar contours on MF and CF constituents at the surface level, though at the underlying level, as it has been proposed in this dissertation, they differ in their tonal specification and alignment. Underlyingly, in SCA, morphological particles are assigned prominence lending high pitch accent, which heads the focus initiated P-phrase ([host=MFM]$_P$) in an IP. On the other hand, when constituents receive CF, they form P-phrases intonationally characterised by L*fH$_P$ pitch structure; its right edge is characterised by focus high boundary tone (fH$_P$)[40]. In case of morphological focus marking also, we get a P-phrase (with LfH* pitch pattern) initiated by focus. The intonational difference between the two types of focus manifestation is best illustrated by the F_0 contour over the constituent. The focus high boundary tone (fH$_P$) does not always block IP internal downstepping order, while focus high pitch accent (fH*) obligatorily blocks this downtrend. Therefore, the blocking of downstepping has been considered here as a phonological cue to the intonational difference between the two types of focus, reflected through two different types of phrasing. In CF realisation, the final rise is caused by P-phrase high boundary tone (fH$_P$),

[40] See chapter 4

whereas in MFM induced focus the final rise is caused by focus high pitch accent (fH*) realised on the MFM. If we consider final high tone on MFMs as focus high boundary tone (fH_P), we fail to phonologically validate the obligatory blocking of the pitch downtrend triggered by MFM induced focus P-phrases.

Although these two types of focus marking are different from each other, they are identical in the sense that both initiate a prosodic phrase out of the focused constituent, and they may not accommodate any segmental process across post-focus prosodic constituents. For instance, in (17) and (18) the word initial [k^h] of *k^huzilɛ* does not spirantise[41] to [x] in both focus types (in (17) and (18) *nɔjɔnɔk* receives CF and MF respectively). This indicates that, like CF, MF also wields PRC on the post-focus sequence.

	L* H_P	L* fH_P		L_I
(17)	[[nɔgɛnɛ]$_P$	[**nɔjɔnɔk**]$_P$	[mala]$_P$	k^huzilɛ]$_I$

The claim that in the IP given in (17), CF on *nɔjɔnɔk* does not initiate [k^h] spirantisation is exemplified below in Figure 6-7.

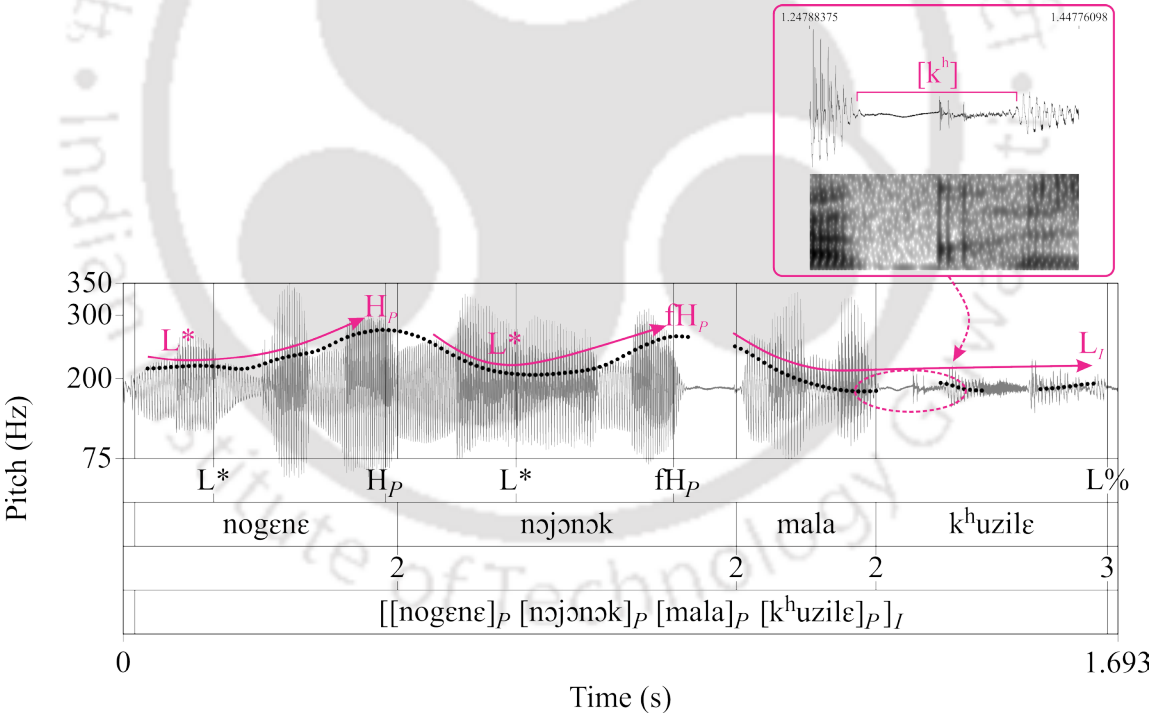


Figure 6-7 In the IP *nɔgɛnɛ nɔjɔnɔk mala k^huzilɛ*, uttered with CF on *nɔjɔnɔk*, the word initial [k^h] of *k^huzilɛ* does not undergo spirantisation since it is separated from the previous vowel by a prosodic boundary.

[41] Intervocalic spirantisation of [k^h] to [x] within a prosodic domain has been discussed extensively in Chapter-4 with reference to focus realisation.

In Figure 6-7, it can be seen that CF realisation on *nɔjɔnɔk* induces PRC on the following P-phrase *mala* but does not remove the prosodic boundary after it. This boundary blocks [k^h] spirantisation to take place across *mala* and *k^{h}uzilɛ*. A detailed analysis of post-focus PRC has been provided with the support of segmental and phonetic evidences in chapter 4 of this dissertation. Similar kind of post-focus PRC is also observed in case of MF realisation in SCA which is exemplified in (18).

L* H_P L fH* L_I

(18) [[nɔgɛnɛ]$_P$ [**nɔjɔnɔk=hɛ**]$_P$ [mala]$_P$ k^{h}uzilɛ]$_I$

In IP (18), *nɔjɔnɔk* is morphologically marked for focus by the MFM=*hɛ*, and this exercises complete PRC on the post-focus constituents without disturbing their prosodic phrasing pattern. It has been demonstrated in Figure 6-8.

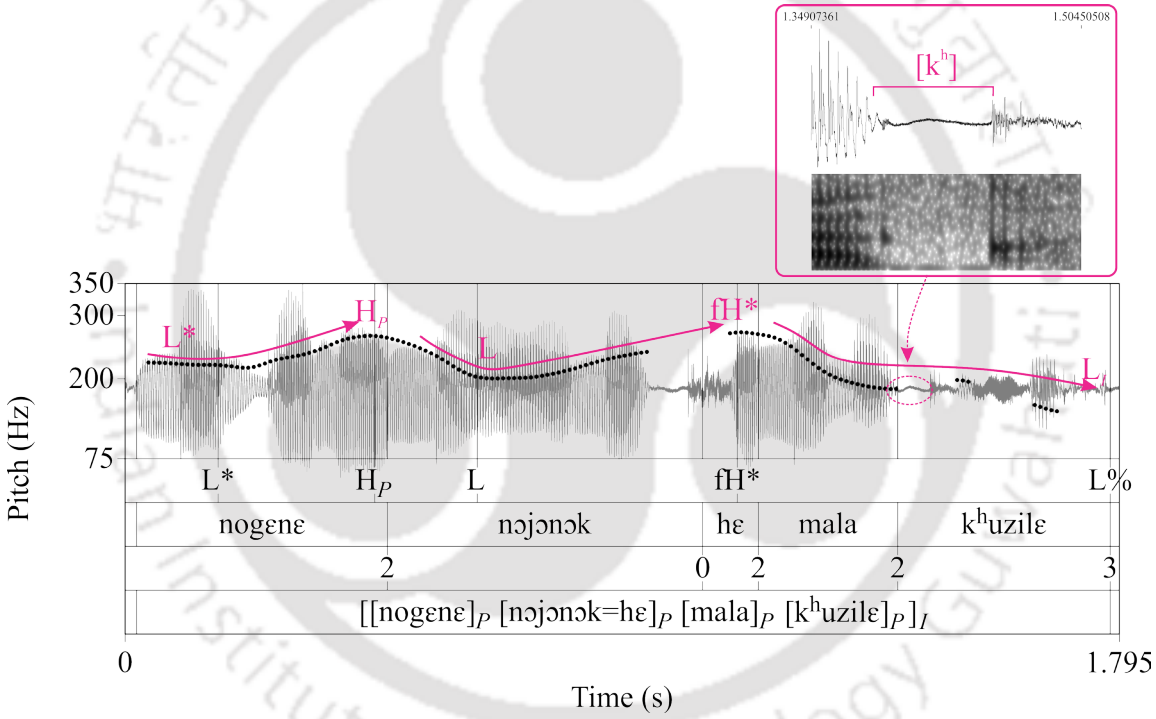


Figure 6-8 In the IP *nɔgɛnɛ nɔjɔnɔk=hɛ mala k^{h}uzilɛ*, *nɔjɔnɔk* is morphologically focused marked by *=hɛ*. The word initial [k^h] of *k^{h}uzilɛ* does not undergo spirantisation since it is separated from *mala* by a prosodic boundary.

Figure 6-8 illustrates how *nɔjɔnɔk* is focus marked with the MFM *=hɛ*; the latter, apart from morphologically highlighting the former, represents the former at the prosodic level by bearing the pitch accent of the focus initiated P-phrase. The constituents following the focus phrase do not compromise their phrasing, which can be illustrated by the way [k^h] of *k^{h}uzilɛ* is pronounced as an aspirated plosive. The intervocalic atmosphere which

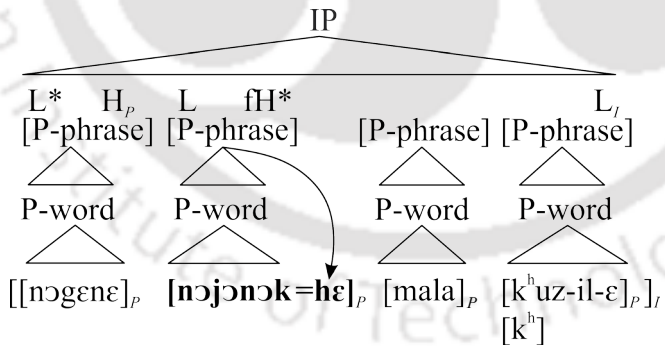
might have induced [k^h] to undergo spirantisation is blocked by the prosodic boundary between *mala* and *k^{h}uzilɛ*.

In the present study, it has been observed and proposed that SCA initiates P-phrases on both CF and MF constituents, and the focus high tone realised on such phrases induces complete PRC on the post-focus P-phrases. In the next section, we discuss how the high tone realised on MFMs has been treated differently by phonologists with reference to different languages. This is followed by the arguments in support of the claims made in this chapter regarding prosodic realisation of MF in SCA.

6.7 Summary

Thus from the above discussion it can be seen how SCA employs phonologically different strategies to prosodically characterise MF and post-focus pitch compression compared to CF realisation. In SCA, the focused constituent is demarcated by a phrase level prosodic boundary following which all other constituents undergo complete PRC keeping their phrasing intact. The claim in the present work that post-focus constituents retain their prosodic phrasing is motivated by the way segmental processes are blocked across these constituents. Though post-focus constituents lose their intonational specification, their phrasing remains unaltered. The prosodic tree illustrating the MF manifestation in (19) is given below.

(19)



The tree-diagram (19) represents the prosodic hierarchy of the utterance *nɔgɛnɛ* ***nɔjɔnɔk=hɛ*** *mala k^{h}uzilɛ* 'Nagen asked only Nayan for a garland', where *nɔjɔnɔk* is focused by attaching the MFM *=hɛ* 'only' to it. It has been already proposed in §6.3 that SCA is a free clitic variety of Assamese in which MFMs are attached only to P-words, and the resultant P-word=MFM sequences forms P-phrases. As such, the MFM *=hɛ* in (19) adjoins the P-word *nɔjɔnɔk* and subsequently constitutes focus P-phrase *nɔjɔnɔk=hɛ*. Now *mala*, which in WF environment (11) receives pitch accent, experiences PRC (19) as a

consequence of focus on *nɔjɔnɔk*. Here the claim is in support of post-focus PRC in contrast to post-focus dephrasing. When constituents dephrase, their phrase level prosodic boundaries obstructing phonological processes (such as segmental assimilation) disappear; this accommodates the said processes to take place across dephrased constituents. In case of SCA morphological focus, post focus constituents continue to block segmental assimilations across post-focus constituents, which form P-phrases in WF condition. Therefore, it has been claimed here that constituents forming P-phrases in WF condition retain their prosodic boundaries even when they are tonally compromised occurring in post-focus location.

The intonational characteristics, prosodic features and segmental features of SCA declarative IPs with MF can be summed up in terms of the following table.

Table 6-1 Summary of Intonational marking of MF and prosodic phrasing, and different segmental processes accommodated within prosodic domains in SCA

<table>
<tr><th>Variant</th><th colspan="2">Pre-focus constituents</th><th colspan="2">Focused constituent</th><th colspan="2">Post-focus constituents</th></tr>
<tr><td rowspan="8">SCA</td><td colspan="6">Intonational marking</td></tr>
<tr><td>Pitch Accent</td><td>Boundary tone</td><td>Pitch Accent</td><td>Boundary tone</td><td>Pitch Accent</td><td>Boundary tone</td></tr>
<tr><td>L*
Or
L*+H</td><td>H_P</td><td>L</td><td>Replaced by pitch accent fH*</td><td>-----</td><td>L%</td></tr>
<tr><td colspan="6">Prosodic Phrasing</td></tr>
<tr><td colspan="2">[L*H_P]
Or
[L*+H H_P]</td><td colspan="2">[L fH*]</td><td colspan="2">Complete PRC
(No conclusive evidence for post-focus dephrasing)</td></tr>
<tr><td colspan="6">Segmental processes within prosodic domains</td></tr>
<tr><td colspan="6">3) Intervocalic aspirate spirantisation</td></tr>
</table>

Table 6-1 predicts that in SCA, constituents bearing MFMs form P-phrases specified with LfH* pitch pattern. Here, the L tone associates with the leftmost prominent syllable of the focused constituent and the fH* tone is realised on the rightmost syllable i.e. the MFM. The pre-focus constituents form P-phrase(s) designated by L*H$_P$ / L*+HH$_P$

tonal specifications. If such P-phrases are shorter in length (normally a content word), they exhibit L*H_P tonal structure, while in longer P-phrases (with more than one content words), the tonal structure is L*+HH_P. As far as the post-focus constituents are concerned, the intonation contour shows the tendency towards dephrasing since all the high boundary tones, which are seen in WF renderings, remain unrealized. However, the segmental processes (see §6.5) underline the existence of prosodic boundaries among the post-focus constituents. Therefore, instead of directly claiming post-focus dephrasing, the present work proposes complete PRC on the post-focus sequence.

6.8 Phonetic correlates of MF in SCA

After the discussion on phonetic cues of CF in SCA (§4.4) in chapter 4, this section will discuss how MF is phonetically manifested in the variety.

6.8.1 Methodology

We have collected and analysed data with MFMs attached to informationally important constituents in SCA. As far as the procedure followed for collecting data, the first two steps (STEP 1 and STEP 2) depicted in §6.4.1 were adopted. The findings are then compared with the findings of our previous study on prosodic realisation of CF (Twaha & Mahanta, 2016). In the present set of data, focus is explicitly marked by attaching MFMs to the right edge of the constituent focused.

6.8.1.1 Subjects

For the data, 3 (three) male and 2 (two) female speakers (20 to 30 years old) from Sivasagar District of Assam were recorded in the recording booth of the Phonetics and Phonology Lab, Indian Institute of Technology Guwahati. The recording was done using a Tascam, D-100 PCM recorder in wav format at the sampling rate of 44 KHz with 16bit resolution with the help of a Shure SM10A head-worn microphone. Care was taken so that the recorded utterances were produced at a normal speech rate.

6.8.1.2 Data analysis

All the constituents from the compared clauses were measured for their pitch and duration values at P-word level using PRAAT (Hayes & Lahiri, 1991). Pitch values were measured at two points in each of the constituent P-words: pitch minimum (F_0 min) and maximum (F_0 max) were measured on the first and the last syllable of each constituent respectively

(Motivation: L/ L* and H_P/ fH* are realised on the first and last syllable of P-phrase respectively). In order to tackle the inter-speaker variation, the extracted values are normalised using z-score normalisation method (Disner, 1980; Rose, 1987; 1991) as described in chapter 4 (18).

By taking the z-score normalised pitch values as dependent variable and focused status as independent variable, a one-way ANOVA test was conducted using StataMP13 (StataCorp, 2013). A sum total of [5(expressions) x 5(speakers) x 4(focus conditions) x3 (iterations)] 300 utterances comprise the current data size. After conducting ANOVA, the values were compared pairwise running post-hoc Bonferroni multiple-comparison test. The post-hoc test provided us with the statistical perspective regarding the difference between different focus realisations on each non-final constituent.

6.8.2 Findings

In chapter 3, it has been demonstrated how in WF context SCA declarative IPs exhibit rising (L*H_P) contours on non-final constituents which are in downstepping relationship from left to right. Further, in the first experiment reported in chapter 4 (§4.4), it has been established that CF induces pitch excursion on focused constituents: CF constituents are marked by higher pitch value on the right edge. Although there takes place an increase in the pitch value of CF constituents in SCA, this increase does not necessarily disturb the downstepping pattern normally observed among P-phrases in SCA declarative IPs[42]. Apart from initiating a phrasing effect on the focused constituent, CF also initiates PRC on the post-focus P-phrases (if there are any). The post-focus PRC is supported by the results of the phonetic experiments conducted and reported in Twaha and Mahanta (2016). CF is highlighted in three ways in SCA: it forms P-phrases, increases the pitch value of the focused constituents and it significantly shrivels the pitch value of the sequence following it.

In the current chapter, it has been proposed that focused constituents hosting MFMs prosodically behave differently from when they receive CF. Superficially, the two focus types may demonstrate rising contours, however at the phonological level these rises have different motivations. It has been proposed that in contrast to L*fH$_P$ pitch contour on

[42] Phonetic and phonological realisation of CF has been discussed elaborately in Twaha and Mahanta (2016).

a constituent receiving CF, in MF the pitch pattern is LfH*. The starred tone in both the patterns designates the most prominent syllable in the respective constituents; it is also the final pitch accent of the respective IPs. MFMs have been proposed to bear focus high pitch accent fH*(cf Bengali *emphatic clitics* (Lahiri & Fitzpatrick-Cole, 1999)), which is preceded by a post-lexically assigned L tone realised on the first syllable of the host. The motivation behind assuming fH* pitch accent on MFMs comes from the intonational contour displayed on MFM induced P-phrases. Downstepping of P-phrases, a characteristic of SCA declarative IPs, is obligatorily blocked by the pitch peak realised on MFMs.

Figure 6-9 and 6-10 display z-score normalised contours of IPs derived by following the methodology described above. The contour in Figure 6-9 represents IPs produced in WF condition, whereas in Figure 6-10 we see a contour where the MFM =*hɛ* has been attached to the third word. Each of the non-final P-phrases in Figure 6-9 are demarcated by rising contour with L*H$_P$ pitch specifications. The P-phrases maintain a downstepping relationship among themselves, i.e. each rise is realised lower than the preceding rise. Due to this downstepping order, the realisation of high boundary tones of P-phrases towards the end may not be phonetically very prominent. As can be seen in Figure 6-9, the rise on the third word is modestly realised. In most of the recorded sentences, the verb starts with the voiceless aspirated stop /k^h/, which initiates a local phonetic effect on the pitch contour just at the beginning of the fourth word. Therefore this local phonetic jump captured in the normalised contour displayed in Figure 6-9 has not been acknowledged phonologically by assigning any tone.

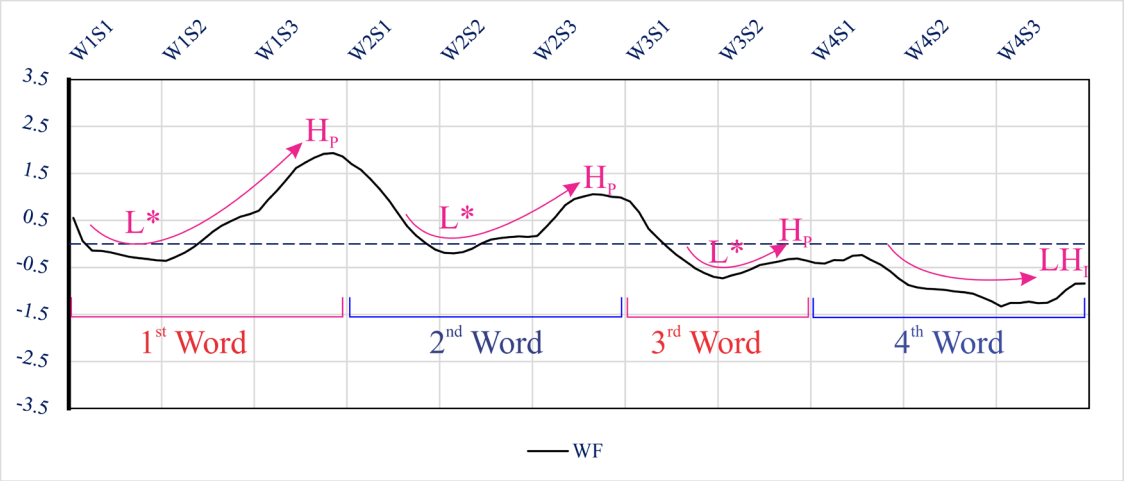


Figure 6-9 z-score normalised contour of WF declarative IPs with SOOV (Subject + Object$_I$ + Object$_D$ + Verb) construction, where all the words are trisyllabic except for the direct object, which is disyllabic.

Compared with the WF contour in Figure 6-9, the pitch curve on the third word in Figure 6-10 is characterised by significant rise. Similar pitch excursion on CF constituents was observed in the experiment (§4.4.2) reported in this chapter 4. CF induced pitch increase and P-phrase formation have been demonstrated in Figure 4-14 and 4-15. In those images, the pitch increase does not block the downstepping trend: pitch peaks on focused constituents are realised lower than preceding peaks.

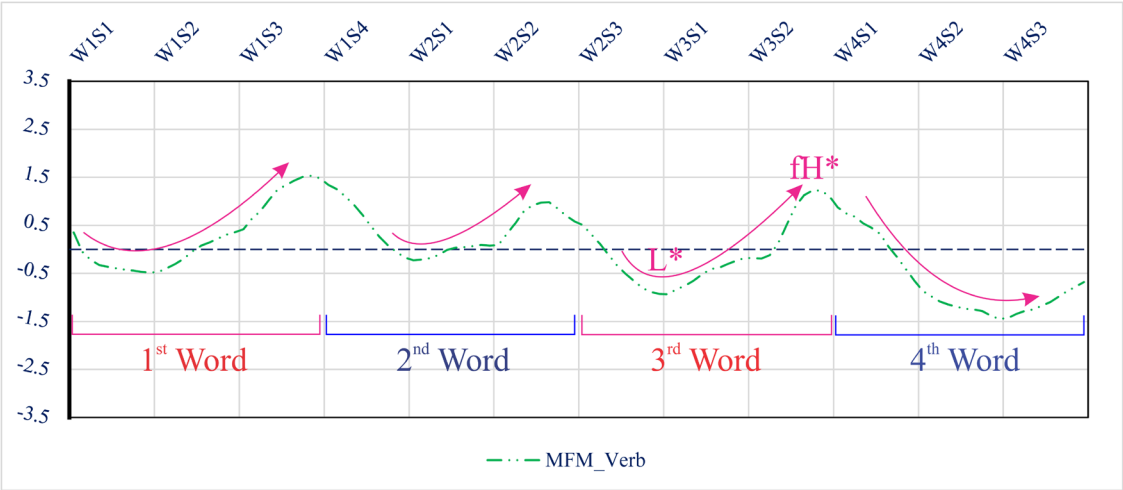


Figure 6-10 In this z-score normalised pitch contour, the third word hosts the MFM =*hε* to its right. The rise on the MFM blocks the downstep otherwise seen in SCA declarative IPs.

However, in Figure 6-10, we get a different picture; the pitch peak on the focused constituent (3rd word) is realised higher than the one preceding it. As proposed earlier in this chapter, since MFMs receive the fH* pitch accent of focus induced P-phrases, the high

tone is phonetically realised more prominent than focus high boundary tones in CF engendered P-phrases.

Identical to CF realisation, reported in chapter 4 (§4.4.2), MFM adjoined focused constituents are not only marked by higher pitch value, they are also succeeded by post-focus PRC. As a consequence of this pitch compression, the entire post-focus sequence demonstrates a smooth fall without any remarkable pitch events. The MF induced pitch compression can be seen in Figure 6-11, where the first constituent hosts the MFM =*hε*.

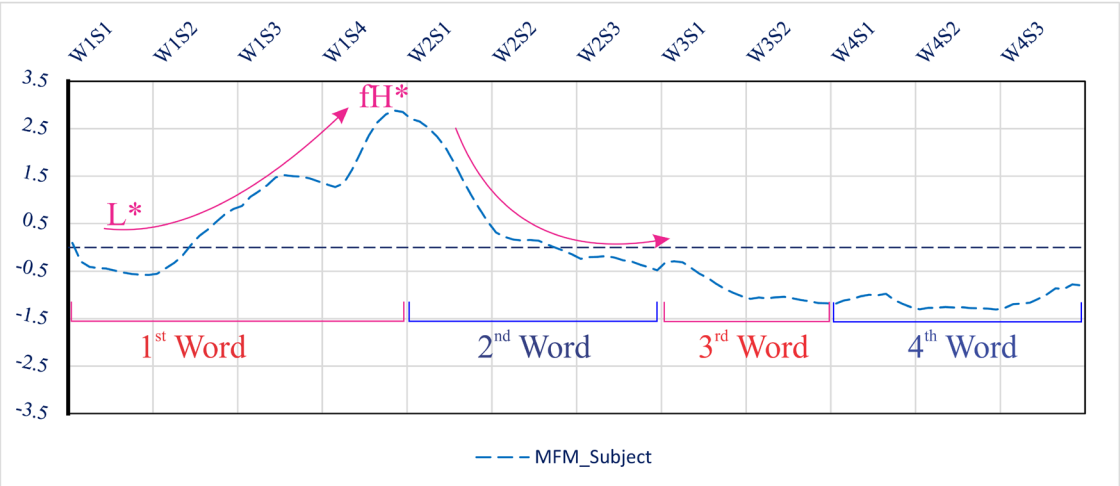


Figure 6-11 In this z-score normalised pitch contour, the first word hosts the MFM =*hε* to its right. MF realised on the first constituent removes all the post-focus pitch variations seen in Figure 5.

In Figure 6-11, the MFM at the end of the first constituent receives focus high pitch accent fH* on it. Subsequently, the pitch contour maintains a smooth fall until the IP boundary where it is stipulated with L_I boundary tone.

In Table 6-2, values comparing MF realisation on three different constituents against their WF counterparts have been demonstrated. The measurements shown are z-score normalised values, they show that constituents adjoining MFMs are characterised by lower and higher pitch values on the first and the last syllable respectively compared to their WF realisation.

Table 6-2 Comparison of F_0 min and max values on the first and the last syllable of words respectively in three different positions under WF and MF conditions.

ANOVA								***Bonferroni post-hoc***	
ITEMS ↓	VALUES ↓	WF		MF		F ↓	*p-value* ↓	Mean differ.	*p-value* ↓
		Mean	*Sd*	*Mean*	*Sd*				
WORD-1	*F_0 max*	1.37	.60	2.15	.39	F(3, 296) = 90.46	0.00	.78	0.00
	F_0 min	-.53	.32	-.74	.42	F(3, 296) = 5.82	0.00	-.21	0.001
WORD-2	*F_0 max*	.84	.63	1.63	.52	F(3, 296) = 181.57	0.00	.79	0.00
	F_0 min	-.34	.37	-.85	.24	F(3, 296) = 60.24	0.00	-.51	0.00
WORD-3	*F_0 max*	-.33	.39	.83	.51	F(3, 296) = 343.11	0.00	1.16	0.00
	F_0 min	-.78	.27	-.96	.17	F(3, 296) = 66.52	0.00	-.18	0.00

The one-way ANOVA results given in Table 6-2 demonstrate that on each constituent (here word), there is statistically significant different F_0 max and min values in the four focus conditions (WF, MF on Word-1, 2 and 3). In order to ascertain the difference between WF and MF realisations of the non-final three constituents, a Bonferroni post-hoc test was conducted which specifically differentiated the pitch values of each constituent in the two focus conditions. As can be seen in the table, the F_0 max, representing fH*, is always realised higher in MF condition than in WF condition (where it represents the high tone boundary tone H_P). On the other hand, F_0 min values, representing L* pitch accent, in MF constituents are always lower than it is in WF condition.

The tabulated data given in Table 6-2 have been demonstrated below with the help of bar diagrams, which reveal how MF words always exhibit higher pitch value on the right edge and lower pitch value on the left-most prominent syllable when compared with WF baseline.

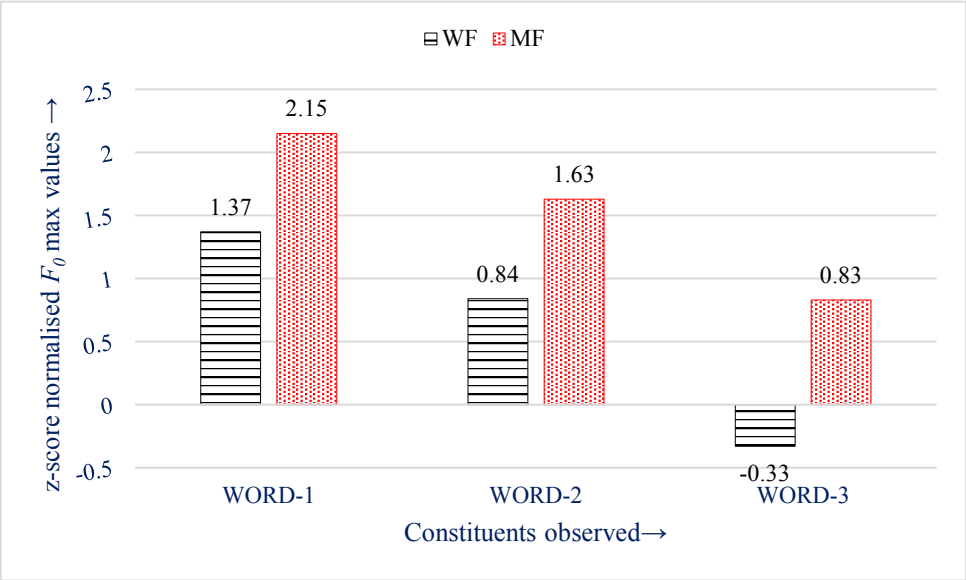


Figure 6-12 The chart compares F_0 max values on the three non-final observed constituents in WF and MF conditions.

Figure 6-12 shows that on each of the non-final constituents, MF initiates higher F_0 max value compared to the constituent's occurrence in WF condition. Further, it is mention-worthy that F_0 max on each focused constituent is realised higher or equivalent to the F_0 max of the preceding constituent in WF condition. For instance, the third constituent has the z-score normalised value of 0.83, which is negligibly lower than the value (0.84) of the preceding peak in WF context. Similarly, the second constituent displays greater F_0 max value (1.63) than the first constituent (1.37) in WF condition. This shows how fH* of MFM induced P-phrases blocks the downstep pattern seen in SCA declarative IPs.

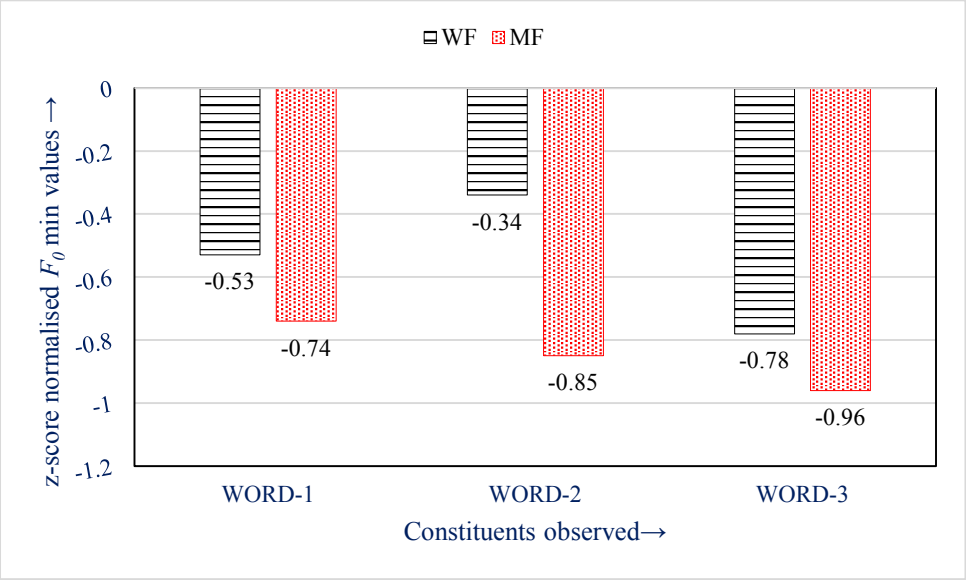


Figure 6-13 The chart compares F_0 min values on the three non-final observed constituents in WF and MF conditions.

In Figure 6-13, the bar chart shows how constituents with MF are characterised by lower F_0 min value on the left-most prominent syllable. Corresponding to the values given in Table 6-2, the bars displayed in Figure 6-13 show significant lowering of F_0 values on constituents with MF.

6.8.3 Summary

The present experiment demonstrates how MF, like CF, initiates pitch excursion on focused constituents, and the pitch contour following such constituents maintains a smooth downward trend. However, unlike P-phrases initiated by CF, MF induced P-phrases block phonological downstepping in IPs.

6.9 Conclusion

The chapter discusses the prosodic aspect of how MFMs in SCA motivate focus realisation and interact with the global intonational contour of declarative IPs. It has been proposed that in SCA, MFMs are characterised by focus high pitch accent (fH*). Apart from marking the most prominent syllable in a focused constituent, it demarcates the right edge of the constituent. The post-focus sequence undergoes PRC as a consequence of post-focal effect of MFM. This compression, however, does not affect the phrasing pattern in post-focus string.

Chapter 7 Morphological focus marking in NVA

7.1 Introduction

After an elaborated discussion on MF manifestation in SCA, in this chapter the concentration is on how focus is marked in NVA with the help of MFMs and its interaction with the prosodic structure. Since the concept of clitics and their possible relations with P-words have been discussed in the previous chapter, it will not be repeated in this chapter. Just as SCA has question emphatic clitic like *=nɛ* and inclusive emphatic clitic *=ʊ*, in NVA we have *=na* and *=o* respectively. Against restrictive emphatic clitics such as *=hɛ* 'only', *=to* 'stresses the host', etc, in SCA, NVA has *=hɛ* and *=tu* respectively. Identical to SCA, MFMs in NVA attract prominence at the post-lexical level, and hence are assigned high pitch accent H*. MFMs not only morphologically designate their arguments by adjoining them but also prosodically represent their focused status by surfacing as the most prominent syllable in the focus initiated P-phrases.

The organisation of the chapter has been given below: §7.2 elaborates how MFMs are distributed in NVA, §7.3 summarises briefly the host=MFM relation in NVA and its typological status. In §7.4, MF manifestation in NVA has been illustrated in details then in §7.5 phonological evidences are demonstrated in support of the claims made in the preceding sections. §7.7 reports an experiment conducted to investigate the phonetic cues to MF. The chapter ends with §7.8, which sums up the chapter briefly.

7.2 Distribution of MFMs

In the previous chapter, it was seen how SCA MFMs minimally adjoin P-words, which may be nouns, verbs, adjectives and postpositions. While MFMs in SCA can appear after inflectional suffixes, they can never precede such suffixes. As far as these characteristics are concerned, NVA is identical to SCA.

Distribution of clitics/ MFMs demonstrated in chapter 6 (§6.2) in relation to SCA are also applicable to NVA MFMs. However, the two varieties maintain a noteworthy phonological difference between each other: the combination of P-word and MFM obligatorily constitutes P-phrases in SCA whereas in NVA, the said combination constitutes P-words. In NVA, as it is apparent in (1b) and (1c), MFM adjoined P-words form P-words which exemplify the existence of prosodic recursion in the variety.

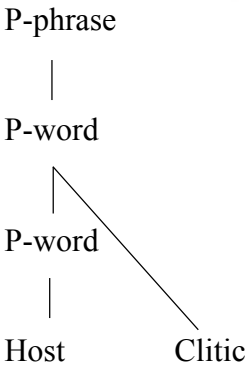
(1) a) (rɔmɛn) *Stem*) *P-word* → Ramen
b) (((rɔmɛn) *Stem*) *P-word* =hɛ) *P-word* → Ramen=only
c) ((kɔr -i) *Stem*) *P-word* → do-PRF3
d) (((kɔr -i) *Stem*) *P-word* =hɛ) *P-word* → do-PRF3=only

Thus going through the distribution pattern of MFMs in SCA and NVA, it can be resolved that in both varieties, MFMs require P-words to adjoin. However, the two varieties adopt two different phonological ways of treating the host=MFM construct; while SCA prompts P-phrases, NVA ends up with P-words. The prosodic effect of MFMs on the post-lexical prosodic structure will be discussed in detail shortly. In the next section, the discussion will be on the typology of host=MFM relationship maintained in NVA.

7.3 Host=clitic relationship in NVA

We have seen in the last chapter how MFMs attach with P-words cross-linguistically, and how such attachments provide us with four typologically distinct treatments of MFMs in different languages. MFMs are treated as 1) P-word clitics, 2) free clitics, 3) internal clitics and 4) affixal clitics. It was further elaborated that SCA treats MFMs as free clitics, and as such it constitutes P-phrases out of host=MFM construct. In the current chapter, it is proposed that NVA treats MFMs as affixal clitics and hence marks a departure from SCA with regards to the treatment of host=MFM relation. As a consequence, in contradiction to P-phrase formation in SCA, in NVA, the host=MFM combination forms P-words. The schema representing how affixal clitics are related to their hosts has already been given in chapter 6 (1d), and is repeated below in (2) for ready reference.

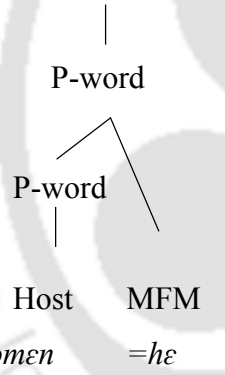
(2) *Affixal Clitic*



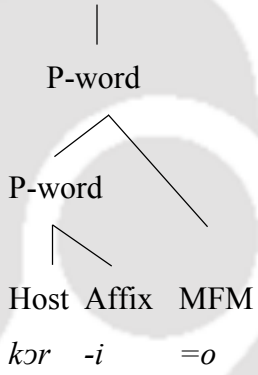
When SCA and NVA are compared with regards to their treatment of MFMs, we can draw a parallel between the two varieties in their treatment of host=MFM relation. Similar to SCA, MFMs in NVA can only be attached to P-words, and hence, host P-word and MFM form two sister nodes (2). However the two varieties maintain a phonological difference as far as the highest node in the host=MFM prosodic tree is concerned: unlike SCA, where these two sisters (P-word and MFM) are daughters to P-phrase, in NVA they are daughters to another P-word.

In (3), the hierarchical analysis of host=MFM relation in NVA has been illustrated with reference to noun=MFM (3a) and verb=MFM (3b) combinations. In both instantiations, MFM is sister to P-word and dominated by P-word indicating prosodic level recursion.

(3) a) *rɔmɛn=hɛ*
Ramen=only



b) kɔr-i =*o*
do-PRF=too



While in (3a) the P-word *rɔmɛn* hosts the MFM =*hɛ*, in (b) the verb root *kɔr* has to undergo inflection in order to form a P-word *kɔr-i* so that it becomes eligible to accommodate the MFM =*o*.

In the next section, we discuss the intonational aspect of MF with reference to NVA. While the discussion continues, we will cite evidences, wherever possible, in support of our claim that in NVA, P-word dominates the said combination.

7.4 NVA Morphological focus

In NVA, as we have seen in chapter 5 on CF, the focused constituent together with post-focus string of constituents is placed in a single P-phrase. The dephrasing of post-focus prosodic phrase(s) is indicated by the loss of boundary tones among these constituents and

accommodation of segmental processes across their boundaries. The left-most syllable of focused constituents bears bitonal nuclear accent (L*+fH) on behalf of the entire focus induced P-phrase. In case of morphological focus marking, we propose that the left-most syllable is no longer metrically the most prominent syllable in focus engendered P-phrase; it is rather MFMs that occupy a more prominent status. Identical to SCA morphological focus marking, MFMs in NVA are specified by the high focus pitch accent H*, which emerges as the most prominent accent in the P-phrase initiated by focus; this accent is also the IP final pitch accent since it is never followed by any other major pitch movement within the IP. However, similar to CF marking, in this type of focus marking also, SCA and NVA maintain phonological difference in the treatment of the post-focus constituents.

7.4.1 Methodology

We adopted the same methodology for NVA data collection, analysis and interpretation which we adopted for SCA data as depicted in the preceding chapter. There were as many as five male speakers from the age group of 22 to 30 years. All the speakers were from the same vicinity in Nalbari district. The data size, recording device and settings maintained in SCA were kept unchanged for NVA.

7.4.2 Findings

In the recorded data, it has been found that even if MFMs in NVA are characterised by metrical prominence and high pitch accent, their phonological orientation in the variety is remarkably different from those in SCA. As described in the preceding chapter, in SCA, MFMs always receive high focus pitch accent of the P-phrases constructed out of host=MFM combination. The schema has been repeated below in (4) for convenience.

L H*
(4) [P-word=MFM]$_P$

In NVA, on the other hand, host=MFM structure exhibits a recursive prosodic structure in that the host=MFM combination is dominated by a P-word node. Thus, in NVA, P-word=MFM combinations do not constitute P-phrases, and are represented as (5).

L H*
(5) [[[P-word=MFM]$_{P\text{-}word}$…]$_P$]$_I$

We have seen in chapter 5 how prosodically marked CF constituents are assigned bitonal focus pitch accent L*+fH on their initial syllables: the starred tone (L*) is realised on the first syllable and the high trailing tone (fH) slurs over the adjacent syllables to the right. This focus highlighting can be represented by the rule given in (6), where X and Y denote constituents preceding and following the focused constituent respectively which may be more than one in number. Rule (6) says when a constituent receives CF, it forms a P-phrase together with the constituent(s) following it.

(6) *CF marking* [Const.] Y → L*+fH L$_I$ [Const. (Y)]$_P$ / [X [____]]$_I$

In (6), the focused constituent and the succeeding string constitute a P-phrase, which is endowed with L*+fH pitch accent on the first syllable of the sequence. As already discussed in chapter 4 and 5, the focus high boundary tone (fH$_P$) seen in SCA is not maintained in NVA; instead it is the focus high trailing tone of the CF pitch accent L*+fH that dephrases the post-focus constituents in NVA.

Now when a constituent is focus marked with MFMs, the process takes place at two different levels: prosodic and morphological. At the morphological level, MFMs physically/ morphologically represent the focused status of the adjoined constituents, and at the prosodic level, the high pitch accent H* realised on MFMs represents the focused status of the host.

In NVA, when constituents host MFMs, they also manifest CF on themselves. Since MFMs assign prosodic prominence to their hosts by receiving a post-lexical high pitch accent, the host=MFM construct is also characterised by the pitch accent. Simultaneously, the host, which is the constituent bearing CF, is endowed with the CF pitch accent L*+fH on its first syllable. How these two pitch accents on the host=MFM construct interact with each other has been explicated in (7).

(7) *MF marking* [[Const]$_w$+MFM]$_w$ Y → L*+fH H*
[[[Const]$_w$+MFM]$_w$ (Y)]$_P$ / [X [____](Y)]$_I$
→ L*+fH H*
[(Const)$_w$+MFM]$_w$ (Y)]$_P$
→ L fH*
[[Const +MFM]$_w$ (Y)]$_P$

In (7), it has been illustrated that in MF, the host=MFM combination forms a P-phrase together with the constituents following it; the post-focus constituents have been denoted by Y. As a consequence, the initial syllable of the focused constituent is assigned L*+fH focus pitch accent. Since the host=MFM sequence is also characterised by H* pitch accent on MFMs, the sequence is now endowed with two pitch accents: L*+fH and H*. These two pitch accents undergo tonal interaction. It has been proposed here that MFMs as focus operators represent the focused constituent at the intonational level by bearing the pitch accent of the focused constituent. As such the pitch accent on the MFM in (7) surfaces as the most prominent accent in the focused sequence and takes priority over the prominence assigned to the initial syllable. Due to marginalisation, the CF pitch accent loses not only the star from L* but also the trailing high tone; with the deletion of the trailing focus high tone, the focus feature 'f' transfers to the high pitch accent H* on the MFM. The initial pitch accent L is not assigned the star in order to highlight its secondary metrical prominence to that of the pitch accent realised on the MFM.

The rule given in (7) explicates the surface intonational realisation (LfH*L_I) of a morphologically marked focus constituent. How the outcome of rule (7) corresponds to the metrical structure has been instantiated in the following variants of the sentence *nɔgɛnɛ nɔjɔnɔk mala k^{h}uizlak* 'Nagen asked Nayan for a garland', which is an NVA version of the SCA sentence discussed in the previous chapter. While (8) metrically demonstrates WF realisation of the sentence, (9) and (10) exhibit prosodic and morpho-prosodic focus manifestation of the sentence respectively. In both (9) and (10), the focus falls on *nɔjɔnɔk*.

			L* H_P	L* H_P	L* H_P	H*	L_I
			x	x	x	x	
			x x x	x x x	x x	x	x
(8)	*WF marking*	→	[[nɔgɛn-ɛ]$_P$	[nɔjɔn-ɔk]	[mala]	[k^{h}uiz-lak]$_P$]$_I$	
			Nagen-NOM	Nayan-ACC	garland	ask-PST3	
			L* H_P	L*+fH		L_I	
			x	x			
			x x x	x x x	x x	x x	
(9)	*CF marking*	→	[[nɔgɛnɛ]$_P$	[**nɔjɔnɔk**	mala	k^{h}uizlak]$_P$]$_I$	

In (9), following Rule-6, the focused constituent *nɔjɔnɔk* is assigned pitch accent L*+fH on its first syllable which forms a P-phrase together with the post-focus sequence

mala kʰuizlak. In WF rendering (8) of the sentence, we can see that corresponding to the metrical structure, each of the P-words is assigned a pitch accent and a boundary tone since all of them form P-phrases. In (9), due to CF realisation on *nɔjɔnɔk*, *mala* loses its metrical prominence at phrase level and hence lacks its tonal specification.

L* H$_P$ L fH* L$_I$

x

x x x

x x x x x x x x x x x

(10) *MFM insertion* → [[nɔgɛnɛ]$_P$ [**nɔjɔnɔk=hɛ** mala kʰuizlak]$_P$]$_I$

In case of (10), since focus on *nɔjɔnɔk* is marked morpho-prosodically, we get two tonally specified syllables in the focus induced phrase: initial and final syllables *nɔ* and *=hɛ*. This tonal specification is derived from the application of the rule given in (7). When Rule-7 applies, the focused constituent *nɔjɔnɔk* is prosodically marked with bitonal focus pitch accent L*+fH (11a) as it normally takes place in CF marking. As the morpho-prosodic representative of the focused constituent, *=hɛ* carries more metrical prominence than *nɔ*, and as such *=hɛ* receives the prominence lending high pitch accent. Though metrically weak, the low tone on the first syllable *nɔ* of *nɔjɔnɔk=hɛ* retains its existence. The high pitch accent realised on *=hɛ* heads the focus initiated P-phrase *nɔjɔnɔk=hɛ mala kʰuizlak*.

L*+fH H* L fH*

x x

x x x x

x x x x x x x x

(11) a) [nɔjɔnɔk=hɛ mala kʰuizlak]$_P$ → b) [nɔjɔnɔk=hɛ mala kʰuizlak]$_P$

Thus in the above discussion it has been shown how focus marked with MFM initiates P-phrases, which include post-focus sequence along with the focused constituent. These prosodic phrases are headed by focus high pitch accent fH* realised on the MFM which is preceded by another post-lexically assigned low tone (L) aligned to the P-phrase initial syllable. This low tone is the remainder of the CF pitch accent L*+fH assigned to the focused constituent before it undergoes marginalisation owing to the presence of the pitch accent H* on *=hɛ*. Intonational contours of the above discussed utterances are demonstrated below.

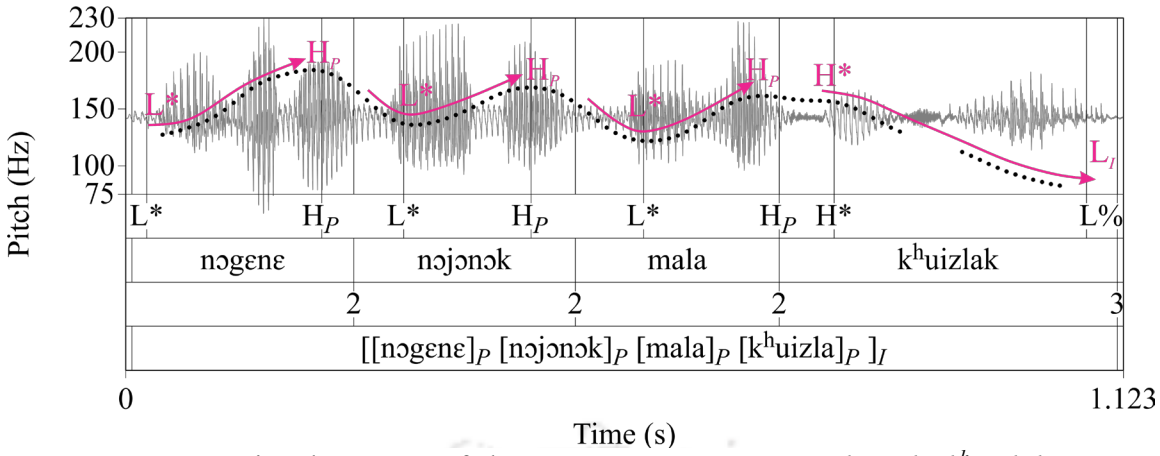


Figure 7-1 Intonational contour of the sentence *nɔgɛnɛ nɔjɔnɔk mala k^{h}uizlak* 'Nagen asked Nayan for a garland' uttered in WF condition.

In WF condition (8), we can see how each pre-verbal constituent constitutes P-phrase with a rising contour manifesting L*H$_P$ pitch pattern (Figure 7-1). These rises maintain a downstepping trend where each following rise is realised lower than its preceding rise. The IP final pitch accent H* falls on the first syllable of the final constituent *k^{h}uizlak* 'ask-PST3'.

Now, if we consider the pitch contour of the IP given in (9), we see how the focused constituent receives rising CF pitch accent (L*+fH) on its first syllable, and constitutes a P-phrase together with the constituents following it.

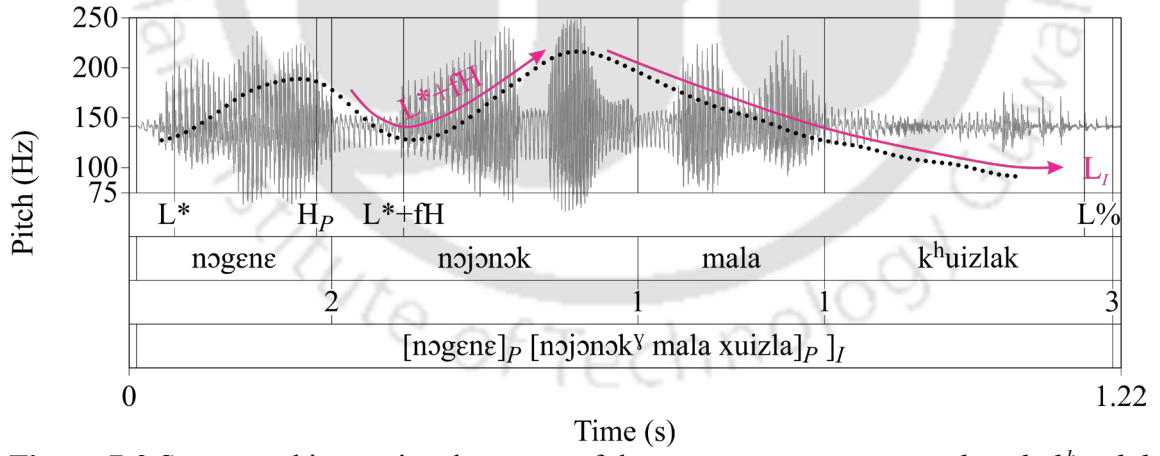


Figure 7-2 Segmented intonational contour of the sentence *nɔgɛnɛ nɔjɔnɔk mala k^{h}uizlak* 'Nagen asked Nayan for a garland' produced with CF on *nɔjɔnɔk*.

In comparison with Figure 7-1, in Figure7-2 the sentence final pitch accent is seen on *nɔjɔnɔk*, which is the constituent with CF. It has been elaborately discussed in Chapter 5 how constituents with CF receive rising pitch accent L*+fH on their left-most prominent syllable. In Figure 7-2, we see a sharp rise on *nɔjɔnɔk* with the starred tone realised on the

left-most syllable and the trailing focus high tone (fH) spreading over the next two syllables. The focused constituent *nɔjɔnɔk* together with the post-focus sequence *mala k^{h}uizlak* forms a P-phrase.

In Figure 7-3, we see the intonational contour of sentence (10), where the focused status of *nɔjɔnɔk* is highlighted by the MFM *=hɛ*.

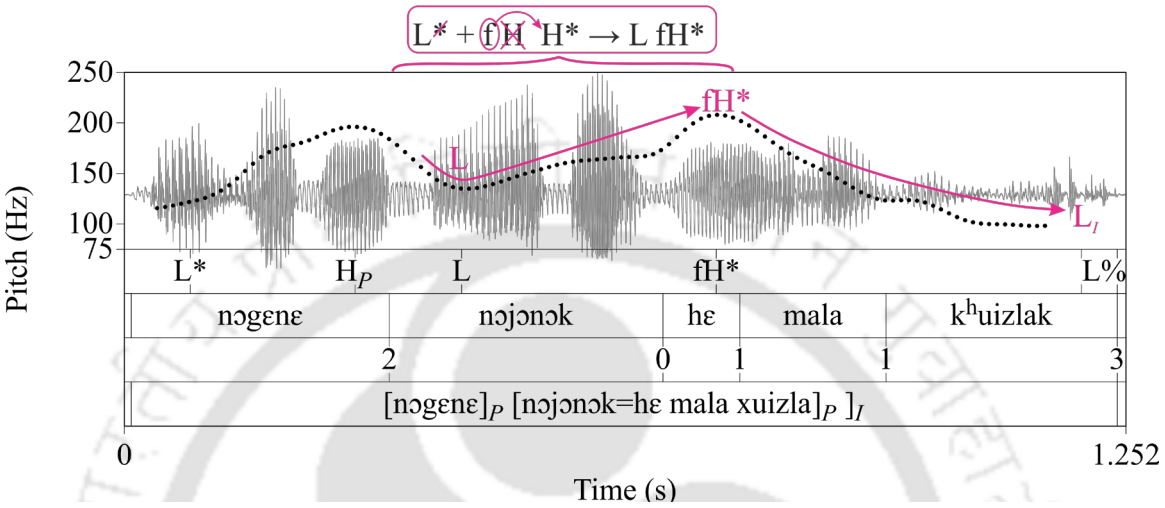


Figure 7-3 Segmented intonational contour of the sentence *nɔgɛnɛ nɔjɔnɔk=hɛ mala k^{h}uizlak* 'Nagen asked only Nayan for a garland' produced with MFM induced focus on *nɔjɔnɔk*.

Since *=hɛ* characterises *nɔjɔnɔk* with informational significance by receiving the prominence lending pitch accent fH* on behalf of the latter, the said accent marginalises the prominence of the phrase initial pitch accent L* to L. As mentioned earlier, this compromise in the prominence of the initial pitch accent is indicated by the absence of the star from L*. Although the star is removed from L*, the tone is associated with the initial syllable of the focused constituent. With the reduction in prominence, the high trailing tone of the pitch accent is also gets deleted; however, the focus feature 'f' is transferred to the post-lexically assigned pitch accent on the MFM. Thus we get pitch pattern L fH*L$_I$ realised on the P-phrase initiated out of the focused and post-focus sequence. In this P-phrase *nɔjɔnɔk=hɛ mala k^{h}uizlak*, the pitch accent on *=hɛ* (fH*) prosodically heads the entire sequence.

In CF condition, *nɔjɔnɔk* is assigned low starred tone of the bitonal pitch accent L*+fH on its first syllable (Figure 7-2), whereas in MFM marked focus, it is the morphological marker *=hɛ* that is designated with a high pitch accent (Figure 7-3). The prosodic prominence of the left-most syllable which is assigned CF pitch accent (L*+fH)

prior to prosodically accommodating the high pitch accent into the focus induced P-phrase leaves a trail on the intonational contour. As a consequence, we get a rising contour on *nɔjɔnɔk=hɛ*. Although the two types of focus realisation (CF and MF) may look similar at the surface level, they have phonologically different motivations. Thus CF and MF both initiate P-phrases in which the focused constituent together with post-focus constituents are taken together. While in CF prominence is assigned post-lexically to the first syllable of the focused constituent in the form of bitonal focus pitch accent L*+fH, in MF it is assigned to the MFM adjoining the focused constituent with focus high pitch accent (fH*). The post-focus constituents in both CF and MF undergo pitch compression as they are dephrased into the focus engendered P-phrase. Hence in NVA, we get L*+fHL_I and LfH*L_I pitch pattern for CF and MF realisations respectively.

7.5 Phonological Evidence

Our proposal for two different types of phonological representation for CF and MF is motivated by both intonational and segmental evidence. Both the types of evidence have been produced below with reference to CF and MF realisation in NVA.

When CF and MF constituents are considered in NVA, we see rising contour on the constituents. Though they exhibit rising contours, they have different phonological motivations for the rise to take place. In case of CF, the rise is initiated by the bitonal CF pitch accent L*+fH on the first syllable of the focused constituent, whereas in MF we get a rise because the initial and the final syllable of the focused constituent are tonally specified for L and fH* respectively.

The NVA intonational phrasing pattern proposed above is strengthened by segmental cues[43] such as intervocalic spirantisation; such processes, which, otherwise blocked across strong prosodic boundaries, are accommodated within a phonological domain. Similar to the phrasing seen in CF realisation, in MF also the focused and post-focus constituents are placed in a single P-phrase. Within this focus initiated P-phrase domain, above mentioned segmental processes are allowed to take place. In order to substantiate our proposal, three examples (already given in (8), (9) and (10)) have been

[43] Different phonological processes intervocalic lenition, vowel weakening, etc. have been discussed in Chapter-4 that explain how post-focus sequence forms a phonological domain along with the focused constituent.

illustrated below: in (12) the focus is on the entire utterance, in (13) CF falls on *nɔjɔnɔk* characterised by a rising pitch accent, and in (14) the same word has been morphologically focus marked with the MFM *=hɛ*. In (13) and (14), the IP final constituent *k^{h}uizlak* testifies how [k^h] spirantisation is allowed across its prosodic boundary which is blocked in (12). Here [k^h] is provided with an intervocalic atmosphere by its following vowel and the word final vowel [a] of *mala* across prosodic boundary. This makes a point that *mala* and *khuizilak* constitute a single phonological domain accommodating segmental processes like spirantisation within its domain.

(12) L* H_P L* H_P L*H_P H* L_I
[[nɔgɛnɛ]$_P$ [nɔjɔnɔk] [mala] [k^{h}uizlak]$_P$]$_I$ ←**WF**
[k^h]

In (12), the IP final constituent *k^{h}uizlak* constitutes a P-phrase and receives the final pitch accent (H*) of the IP.

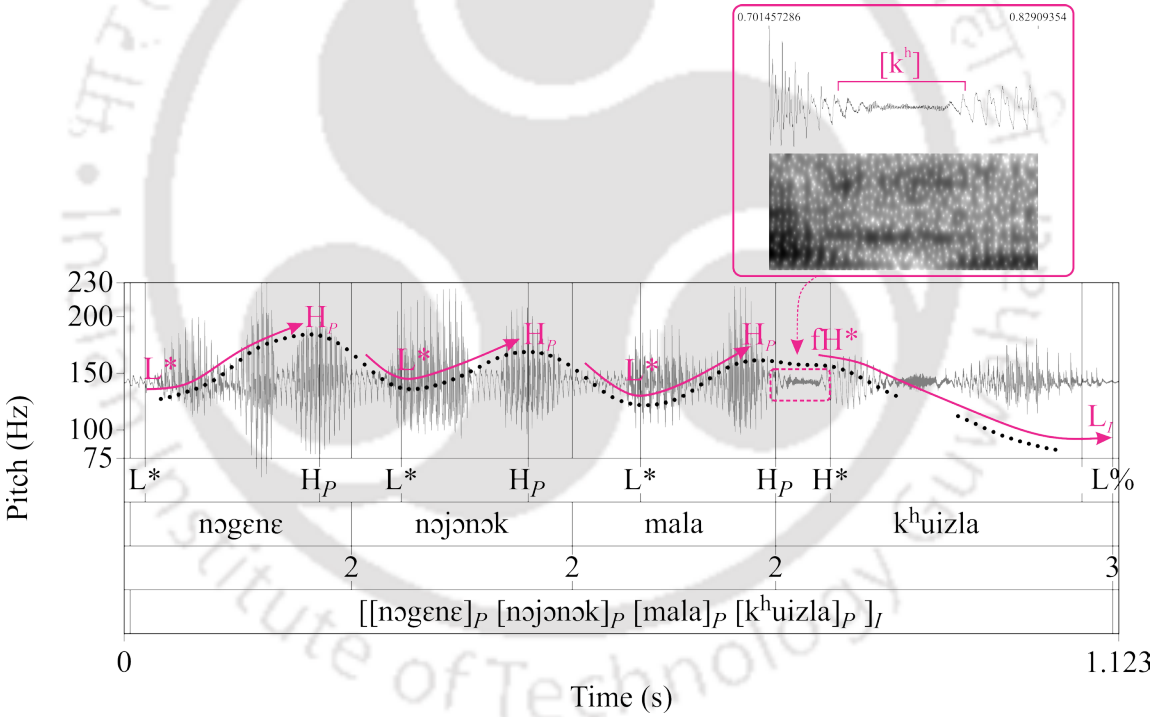


Figure 7-4 In the WF rendering of *nɔgɛnɛ nɔjɔnɔk mala k^{h}uizlak* 'Nagen asked Nayan for a garland', the prosodic boundary before *k^{h}uizlak* blocks [k^h] spirantisation.

In Figure 7-4, the inset demonstrates how word initial [k^h] of *k^{h}uizlak* does not spirantise to [x] since it fails to get the required intervocalic environment in order to undergo spirantisation. It is the prosodic boundary between *mala* and *k^{h}uizlak* that blocks the segmental process.

	L* H_P	L*+fH			L_I	
(13)	[[nɔgɛnɛ]$_P$	**[nɔjɔnɔk**	mala	k^{h}uizlak]$_P$]$_I$		**←CF**
				[x]		

IP (13) is uttered with CF on *nɔjɔnɔk*, which is assigned L*+fH pitch accent and forms P-phrase together with the constituents following it. The segmented contour of (13) has been given in Figure 7-5.

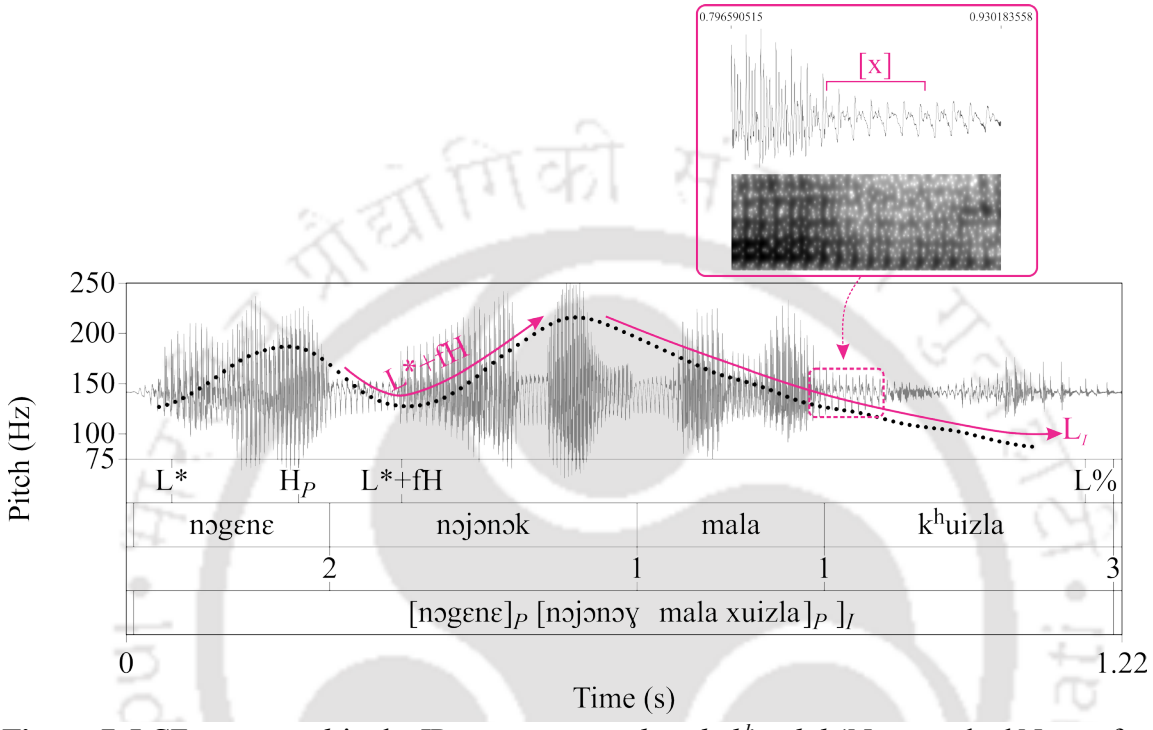


Figure 7-5 CF on *nɔjɔnɔk* in the IP *nɔgɛnɛ nɔjɔnɔk mala k^{h}uizlak* 'Nagen asked Nayan for a garland', removes the prosodic boundaries among constituents following it. This prepares the intervocalic atmosphere for [k^h] of *k^{h}uizlak* to spirantise to [x].

In Figure 7-5, since *nɔjɔnɔk* is assigned CF, it forms P-phrase together with the constituents following it. As a consequence, all the phrase level prosodic boundaries shown in Figure 7-4 are removed, preparing the intervocalic environment for [k^h] of *k^{h}uizlak* to undergo spirantisation. Now, let us consider IP (14), where the indirect object *nɔjɔnɔk* is morphologically marked for focus by MFM *=hɛ*.

	L* H_P	L	fH*		L_I	
(14)	[[nɔgɛnɛ]$_P$	**[nɔjɔnɔk=hɛ**	mala	k^{h}uizlak]$_P$]$_I$		**←MF**
				[x]		

In (14), the focused constituent *nɔjɔnɔk=hɛ* bears high focus pitch accent fH* on the MFM *=hɛ*. As per the rule given in (7), due to post-focus dephrasing, the focused constituent in combination with the post-focus constituents constitutes a prosodic domain. This prosodic domain, similar to the P-phrase initiated by CF, accommodates segmental processes such

as aspirate spirantisation. The intonational contour of IP (14) has been given in Figure 7-6.

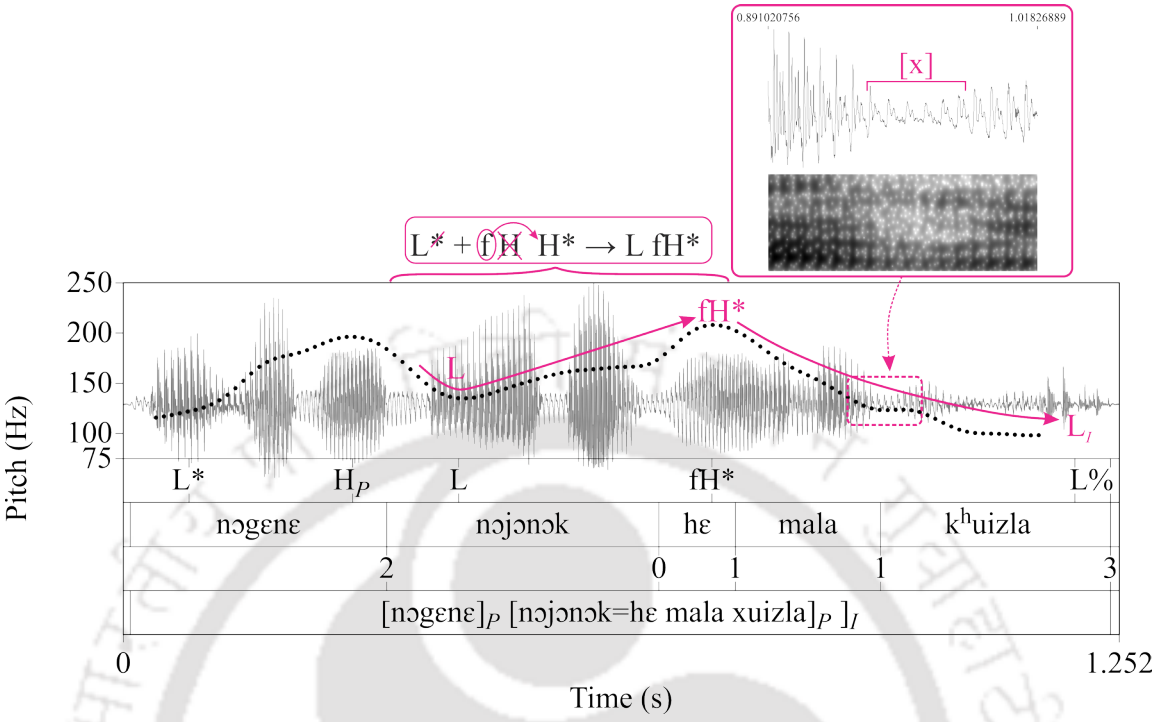


Figure 7-6 In the IP *nɔgɛnɛ nɔjɔnɔk=hɛ mala k^{h}uizlak* 'Nagen asked only Nayan for a garland', the focused constituent *nɔjɔnɔk=hɛ* forms P-phrase together with *mala k^{h}uizlak* accommodating [k^h] spirantisation.

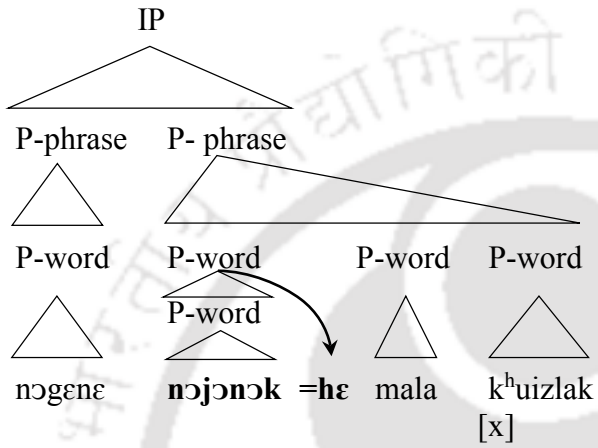
In Figure 7-6, the MFM *=hɛ* morphologically marks *nɔjɔnɔk* as the focused constituent, which dephrases the post-focus constituents and forms P-phrase together with them. The evidence in support of the claim can be derived from the way segmental processes are allowed to take place across the constituents in the prosodic phrase. For instance, in the Figure it has been explicated how word initial [k^h] is produced as [x] since it gets an intervocalic atmosphere across two constituents: *mala* and *k^{h}uizlak*.

7.6 Discussion

In this chapter, it can be seen that morphological focus marking in NVA is different from MF realisation in SCA on the one hand and CF realisation in NVA on the other. As against SCA, where MF has a phrasing effect on the focused constituent and PRC effect on the post-focus constituents, in NVA MF has a dephrasing effect on the post-focus sequence, and it initiates a P-phrase that includes the focused and post-focus constituents within itself. Further, in contradiction to low pitch accent in NVA CF realisation, the focused constituent in MF receives high focus pitch accent on the morphological marker.

In SCA, the focused constituent forms an independent P-phrase designated by L fH* pitch contour. The focus pitch accent (fH*) realised on the MFM apart from being prosodic head of the focused constituent, constitutes the final pitch accent of the IP. In NVA on the other hand, though the pitch accent realised on MFMs forms IP final pitch accent (similar to SCA), it heads the entire focused plus post-focus string. While in SCA we proposed for complete post-focal PRC, in NVA the sequence following focus undergoes dephrasing.

(15)



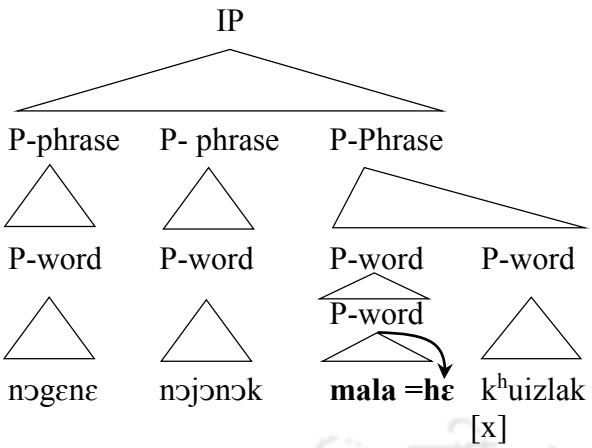
As discussed in §7.3, NVA, as an affixal clitic variety of Assamese, attaches MFMs only to P-words, and subsequently, accommodating prosodic recursion, forms another P-word comprising P-word=MFM structure. In (15), the prosodic hierarchical analysis of utterance (14) has been displayed where we see how the construct of focused and post-focus constituents *nɔjɔnɔk=hɛ* and *mala k^{h}uizlak* respectively are dominated by a single P-phrase node. The motivation behind our claim is derived from the segmental processes accommodated across constituent P-words within a P-phrase. For instance, the word initial [k^h] of *k^{h}uizlak* is provided with an intervocalic environment across two P-words *mala* and *k^{h}uizlak* which spirantises [k^h] to [x]. It establishes that *mala* and *khuizlak* belong to a single P-phrase. The process of spirantisation holds true in (16) as well, where *mala* is morphologically marked with MFM *=hɛ* for focus; this again authenticates that *mala=hɛ* and *k^{h}uizlak* form a single P-phrase.

(16)

L* H_P	L H_P	L fH*	L_I
[[nɔgɛnɛ]$_P$	[nɔjɔnɔk]	[**mala=hɛ**	k^{h}uizlak]$_P$]$_I$
		[x]	

The hierarchical tree given in (17), representing (16), illustrates how the focused constituent *mala=hɛ* together with the post-focus constituent *k^{h}uizlak* is dominated by a P-phrase node.

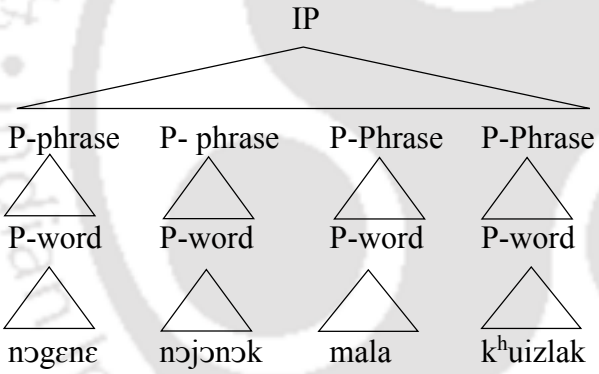
(17)



Since *mala=hɛ k^{h}uizlak* is dominated by a P-phrase node, [k^h] spirantisation is allowed to take within its domain. Further, justifying NVA MFMs as affixal clitics, it has been shown how the host=MFM construct *mala=hɛ* is dominated by another P-word node.

The hierarchical trees of IPs with MF illustrated above: (15) and (17) can be compared with the hierarchical tree of their WF variant displayed below in (18).

(18)



Hierarchical tree (18) represents the IP given in (19); the IP is uttered in WF context and in it we have four P-phrases, each corresponding to a P-word.

	L* H$_P$	L H$_P$	L*H$_P$	H* L$_I$
(19)	[[nɔgɛnɛ]$_P$	[nɔjɔnɔk]	[mala]	[k^{h}uizlak]$_P$]$_I$

In the tree given in (18), *mala* and *k^{h}uizlak* are separately dominated by two P-phrase nodes, and hence separated by phrase level prosodic boundary. This prosodic boundary blocks intervocalic environment for [k^h] which is seen in the above two MF IPs: (14) and (16).

In the following table, we see how in NVA declarative IPs with MF on a constituent are intonationally characterised and prosodically phrased.

Table 7-1 Summary of Intonational marking of CF and prosodic phrasing, and different segmental processes accommodated within prosodic domains in NVA

<table>
<tr><th>Variant</th><th colspan="2">Pre-focus constituents</th><th colspan="2">Focused constituents</th><th colspan="2">Post-focus constituents</th></tr>
<tr><td rowspan="8">NVA</td><td colspan="6">Intonational marking</td></tr>
<tr><td>Pitch Accent</td><td>Boundary tone</td><td>Pitch Accent</td><td>Boundary tone</td><td>Pitch Accent</td><td>Boundary tone</td></tr>
<tr><td>L*
Or
L*+H</td><td>H_P</td><td>LfH*</td><td>-----</td><td>-----</td><td>L%</td></tr>
<tr><td colspan="6">Prosodic Phrasing</td></tr>
<tr><td colspan="2" rowspan="2">[L*H_P]
Or
[L*+H H_P]</td><td colspan="4">[LfH* L_I]</td></tr>
<tr><td colspan="2">-----</td><td colspan="2">Dephrased</td></tr>
<tr><td colspan="6">Segmental processes within prosodic domains</td></tr>
<tr><td colspan="6">6) intervocalic aspirate spirantisation</td></tr>
</table>

The table shows that MF initiates a prosodic domain that includes the entire string of focused and post-focus constituents. This domain is headed by high focus pitch accent fH* realised on the MFM which is preceded by phrase initial L tone and followed by IP final L_I boundary tone. The pre-focus constituents form P-phrases, which show rising contours characterised by L*H_P or L*+HH_P tonal specification. Further, the prosodic domains, both pre-focus, and MF initiated ones, accommodate segmental processes such as intervocalic aspirate spirantisation.

Therefore, it has been proposed that MF initiates a P-phrase, which dominates all the post-focus constituents along with the focused constituent. It justifies post-focus dephrasing in NVA which removes all the prosodic boundaries across constituents accommodating segmental processes like spirantisation, etc.

Thus it can be seen that in contradiction to SCA, which initiates P-phrases in both CF and MF realisations showing proneness to retain the post-focus P-phrasing intact, NVA initiates P-phrases that include focus and post-focus constituents together in both types of

focus realisations. NVA dephrases the potential post-focus P-phrases[44] into the focus initiated P-phrase removing the prosodic boundaries among them. In the next section, an experiment will be reported which was conducted in order to see the phonetic correlates of MF in NVA.

7.7 Phonetic correlates of MF in NVA

After discussing on the prosodic aspect of MF realisation in NVA so far, in this section, an experiment will be reported which was conducted to see the phonetic cues to MF in the variety. In §5.3 of chapter 5, we have already seen how phonetic cues to CF are employed in NVA.

7.7.1 Methodology

The methodology adopted in the present experiment is similar in strategy to the experiment conducted on SCA MF manifestation (§6.8) in chapter 6. The sentence pattern, however, is different. The sentences used in the experiment are implied subject sentences with AOAV (Adverb + Object + Adverb + Verb) structure.

Recordist:	ki	ho-l ?				
	what	happen-PST3				
	What did happen?					
Speaker:	azi	teo-k	rasta-t	dek^{h}-l-u		← **WF**
	today	him-ACC	road-LOC	see-PST-1		
	Today (I) saw him on road.					
Recordist:	azi	teo-k	matro	g^{h}ɔr-ɔt	dek^{h}-l-i ?	
	today	him-ACC	only	road-LOC	see-PST-2	
	Did you see him only at home today?					
Speaker:	nai nai	azi	teo-k	**rasta-t=o**	dek^{h}-l-u	← **MF**
	No no	today	him-ACC	road-LOC=also	see-PST-1	
	No no, today I saw him on the road also.					

[44] Potential P-phrases are those constituents which form (or may form) P-phrases in WF rendering of the IP concerned.

7.1.1.1 Subject

Four male speakers were recorded from Nalbari district, Assam out them three speakers have been reported here. Retaining the settings of the previous experiments intact, the recording took place in a silent atmosphere.

7.1.1.2 Data analysis

The recorded sentences were analysed following the same procedures described in the experiment (§6.8) on MF realisation in SCA. In this experiment also, a one-way ANOVA test was conducted on z-score normalised pitch values with pitch values as dependent variable and focused status as fixed factor. There were [8(expressions) x 3(speakers) x 2(focus conditions) x3 (iterations)] 144 (one forty four) analysed utterances.

7.7.2 Findings

In this chapter, it has been illustrated how MFMs receive IP final pitch accent (fH*) in NVA IPs with MF. It is in contradiction to WF utterances in NVA where non-final P-phrases are marked by low pitch accent (L*) on initial syllables and high boundary tone (H_P) on final syllables. Therefore, pitch values were compared at these two points in the observed constituents: the first and last syllables. In the following two images: Figure 7-7 and 7-8, the pitch contours of WF and MF realisation of identical utterances have been demonstrated.

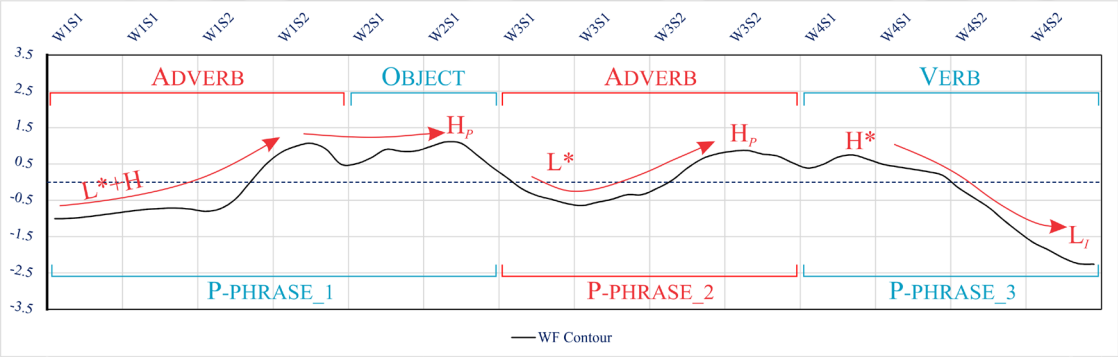


Figure 7-7 z-score normalised contour of NVA declarative IP with AOAV (Adverb + Object + Adverb + Verb) construction in WF condition, where all the words are trisyllabic except for the direct object, which is disyllabic.

In Figure 7-7, the WF normalised contour reveals how non-final P-phrases in NVA maintain rising pitch pattern with L* pitch accent whereas the final P-phrase shows falling

contour with H* pitch accent. Now if one checks Figure 7-8which is morphologically marked for focus on the third word, one gets a different picture.

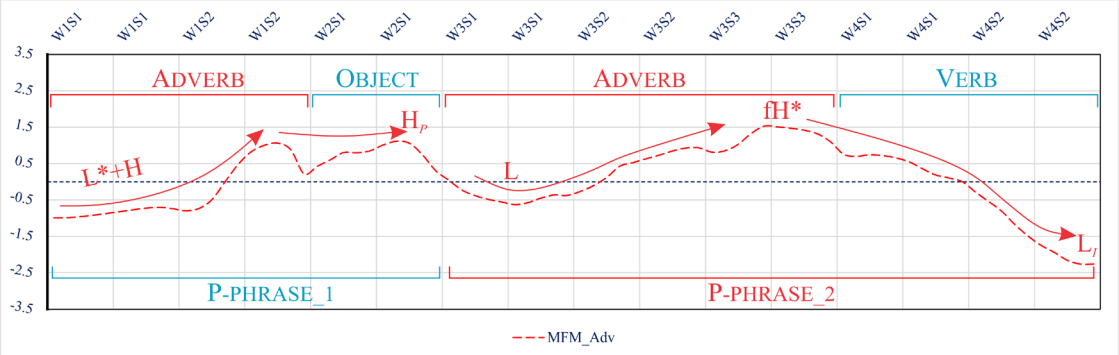


Figure 7-8 z-score normalised contour of NVA declarative IPs with AOAV (Adverb + Object + Adverb + Verb) construction in MF condition, where the third word hosts the MFM *=o* 'also' to its right. The peak on the second P-phrase is realised higher than the one preceding it.

In Figure 7-8, the MFM *=o* 'also' adjoining the third word receives high focus pitch accent fH* of the final P-phrase. As illustrated in the current chapter, the pitch accent realised on the MFM in NVA is the prosodic head of the focus initiated P-phrases which demonstrates higher pitch value than the high tone realised on the P-phrase preceding it. Similar to SCA, in NVA the focus high pitch accent fH* blocks IP internal downstep.

One-way ANOVA test results show that pitch value at the right edge of MF constituents is higher than its WF realisation. As it can be seen from the bar diagram (Figure 7-9), while the focused constituent marked with the MFM *=o* shows significant pitch increase compared to its WF realisation, the pre-focus constituents demonstrate identical measurements: 1.11 in both WF and MF conditions.

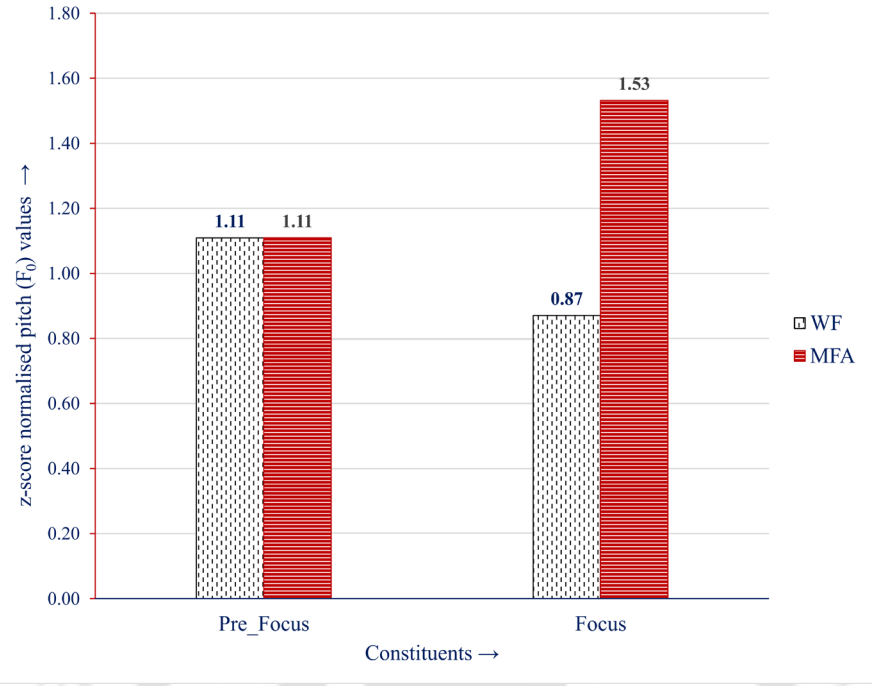


Figure 7-9 Bar chart comparing normalised pitch peaks of pre-focus and focused constituents in WF and MF conditions. Black Vertical dashes=WF condition;Red horizontal lines=MF condition.

Furthermore, the bar chart given in Figure7-9 shows how in WF condition the second peak is realised lower than the first peak represented by bars with dashed vertical lines. On the other hand, the red bars with horizontal lines demonstrate how the second constituent hosting =*o* is realised higher than the peak realised on the first syllable. In this respect, NVA shares similarity with SCA, since the pitch peak realised on MFMs block IP internal downstepping.

7.7.3 Summary

In the previous section of the chapter, one can see how the experiment conducted on MF realisation in NVA establishes higher pitch value on MFMs as the prominent cue to MF in the variety. This pitch rise on focused constituents obstructs the normally seen downstepping pattern among P-phrases in NVA declarative IPs.

7.8 Conclusion

In this chapter, MF realisation in NVA has been discussed. The chapter starts with a brief introduction to how MFMs are distributed in the variety. Subsequently, the typology of host=MFM relation is discussed in the next section. It reveals that NVA considers MFMs

as affixal clitics, which form P-words together with their hosts. Then it is seen that in the variety, MFMs are compulsorily characterised by the high pitch accent H*, which represents the focused status of the host. At the post-lexical level, this high pitch accent derives the focus feature 'f', which enables the pitch accent to wield a dephrasing effect on the post-focus constituents. The focus pitch accent on MFMs heads the entire sequence of focused and post-focus constituents as a single prosodic phrase accommodating segmental processes to take place across prosodic boundaries of the constituents. The pitch pattern of the MF engendered P-phrase is LfH*L_P: the initial L aligns with the first syllable of the focused constituent (host), fH* is realised on the MFM and L_P gets associated with the final syllable of the P-phrase which is also the last syllable of the IP. Finally, in the chapter a production experiment has been reported demonstrating the phonetic cues (such as F_0 and duration values) to MF in NVA.

Chapter 8 Focus prosody in SCA and NVA compared and contrasted

8.1 Introduction

After extensively discussing CF and MF realisation in SCA and NVA in the last four chapters, in this chapter the two varieties are compared and contrasted vis-à-vis the two focus realisations. In chapter 4 and 5, we saw that in opposition to two-sided prosodic demarcation of CF constituents in SCA, focused constituents in NVA are prosodically demarcated only to the left. Chapter 6 and 7, which discuss MF in SCA and NVA respectively, explicate that though the two varieties characterise MFMs with a pitch accent, they prosodically incorporate and arrange MFMs in P-phrases differently. The present chapter develops as per the following plan: in §8.2, CF prosody of SCA is compared with that of NVA with appropriate illustrations, in §8.3 the differences and similarities between MF realisation in SCA and NVA are highlighted. Finally, § 8.4 concludes the chapter with remarks on how focus prosody of the two varieties is typologically comparable with other SALs.

8.2 CF in SCA and NVA

CF manifestation in SCA differs from that in NVA in at least two respects: 1) the way it phonologically highlights focused constituents and 2) its treatment of the post-focus sequence. In chapter 4, it has been discussed elaborately how CF constituents in SCA are assigned demarcating low pitch accent L* and focus high boundary tone fH_P. Further, it initiates a separate prosodic domain which accommodates segmental processes to take place domain internally, and blocks them beyond the domain. Chapter 5, on the other hand explicates that NVA demarcates CF constituents on their left edge with a CF focus pitch accent L*+fH. Unlike SCA, focused constituents are left prosodically unmarked to their right. Constituents with CF, together with the post-focus sequence, behave as unitary prosodic domains, which allow segmental processes within themselves. Since the two varieties behave in an identical manner with regards to constituents in the pre-focus sequence, any discussion on the topic has been skipped in the present chapter. In §8.2.1, a comparative discussion on CF realisation in SCA and NVA has been provided then in §8.2.2, prosodic manifestation of post-focus constituents has been discussed.

8.2.1 Focused constituent

In SCA, WF utterances display rising contours on non-final P-phrases and falling contour on the final P-phrase. While former are designated by L*H$_P$ pitch specification (LH melody), the latter is not assigned any phonological prominence. This can be seen in the schematic presentation given in (1).

SCA IP

	L* H$_P$	L* H$_P$	L*H$_P$	L$_I$			
1)	[[nɔgɛn-ɛ]$_P$	[nɔjɔn-ɔk]$_P$	[mala]$_P$	[k^{h}uz-il-ɛ]$_P$]$_I$			←**WF**
	Nagen-NOM	Nayan-ACC	garland	ask-PST-3			
	Nagen asked Nayan for a garland.						

In (1), the non-final P-phrases *nɔgɛnɛ*, *nɔjɔnɔk* and *mala* are designated by L*H$_P$ pitch contour, and the final P-phrase *k^{h}uzilɛ*, which is tonally underspecified, right aligns with the IP boundary and bears IP boundary tone L$_I$. When any of these constituents receives CF, it is demarcated by CF pitch contour L*fH$_P$.

SCA IP

	L* H$_P$	L* H$_P$	L*fH$_P$	L$_I$			
2)	[[nɔgɛn-ɛ]$_P$	[nɔjɔn-ɔk]$_P$	[**mala**]$_P$	[k^{h}uz-il-ɛ]$_P$]$_I$			
	L* H$_P$	L* fH$_P$		L$_I$			
3)	[[nɔgɛn-ɛ]$_P$	[**nɔjɔn-ɔk**]$_P$	[mala]$_P$	[k^{h}uz-il-ɛ]$_P$]$_I$			←**CF**
	L* fH$_P$			L$_I$			
4)	[[**nɔgɛn-ɛ**]$_P$	[nɔjɔn-ɔk]$_P$	[mala]$_P$	[k^{h}uz-il-ɛ]$_P$]$_I$			

In Figure 8-1, the intonational contours of all the IPs given in (1-4) have been provided in panels (a-b) respectively. The contours show how focused constituents are demarcated by L* pitch accent on the leftmost prominent syllable and fH$_P$ boundary tone on the right edge. Irrespective of their position, focused constituents form P-phrases. These P-phrases accommodate various segmental processes within its periphery, such as /r/ deletion, aspirate spirantisation, etc. (see chapter 3 and 4).

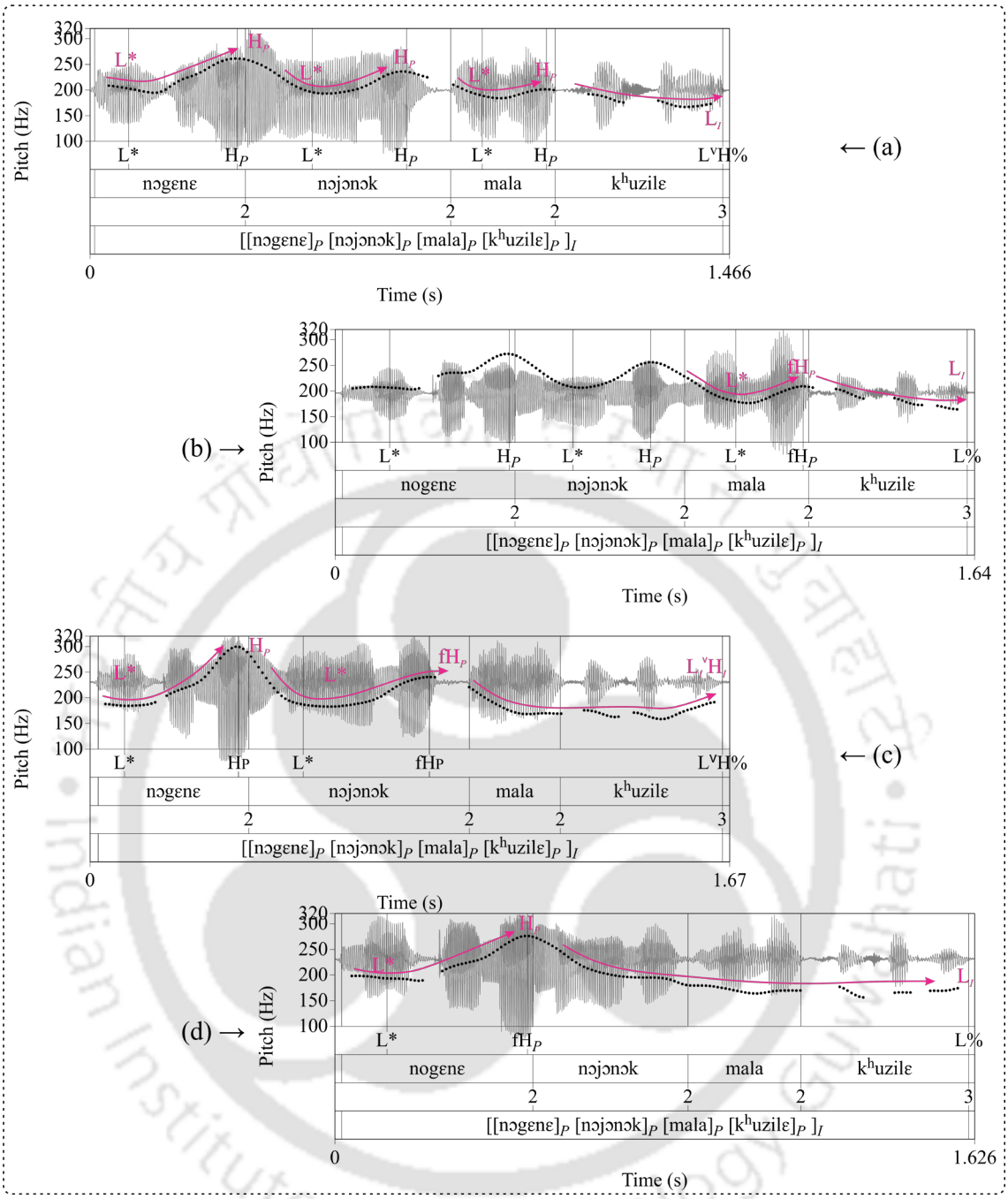


Figure 8-1 The panels given in (a) to (d) correspond to the SCA IPs given in (1) to (4) respectively. As opposed to the WF rendering in (a), in the rest of the panels, the CF is on the first, second and third constituent respectively.

In NVA, on the other hand, focused constituents are characterised by the focus pitch accent L*+fH on their leftmost prominent syllable. CF initiates P-phrases with focused constituents. But, unlike SCA, it does not demarcate the right edge of the focused items. The prosodic phrasing pattern of the NVA variants of the SCA IPs given in (1-4) has been given below in (5-8).

NVA IP

	L* H_P	L* H_P	L*H_P	H* L_I			
5)	[[nɔgɛn-ɛ]$_P$	[nɔjɔn-ɔk]$_P$	[mala]$_P$	[k^{h}uiz-l-ak]$_P$]$_I$			←**WF**
	Nagen-NOM	Nayan-ACC	garland	ask-PST-3			
	Nagen asked Nayan for a garland.						
	L* H_P	L* H_P	L*+fH	L_I			
6)	[[nɔgɛn-ɛ]$_P$	[nɔjɔn-ɔk]$_P$	[**mala**	k^{h}uiz-l-ak]$_P$]$_I$			
	L* H_P	L*+fH$_P$		L_I			
7)	[[nɔgɛn-ɛ]$_P$	[**nɔjɔn-ɔk**	mala	k^{h}uiz-l-ak]$_P$]$_I$			←**CF**
	L*+fH			L_I			
8)	[[**nɔgɛn-ɛ**	nɔjɔn-ɔk	mala	k^{h}uiz-l-ak]$_P$]$_I$			

In WF condition (5), each non-final constituent is specified by L*H$_P$ pitch contour, and unlike SCA, the final constituent is assigned H* pitch accent on the initial syllable and L$_I$ boundary tone on the final syllable. With regards to CF marking, as it can be seen in (6-8), focused constituents are characterised by L*+fH pitch accent. The intonational manifestations of the IPs given in (5-8) have been demonstrated in the panels (a-d) respectively in Figure 8-2.

As per the tonal representation given in (5-8), CF constituents in NVA show rising contours (Figure 8-2). Unlike SCA, where the focus high boundary tone is manifested on the right edge of the focused constituent, and therefore adjudged as the boundary tone, in NVA, the focus high tone is realised prior to the right edge of the focused constituent. This supports the variant specific intonational representation of CF constituents in the two varieties.

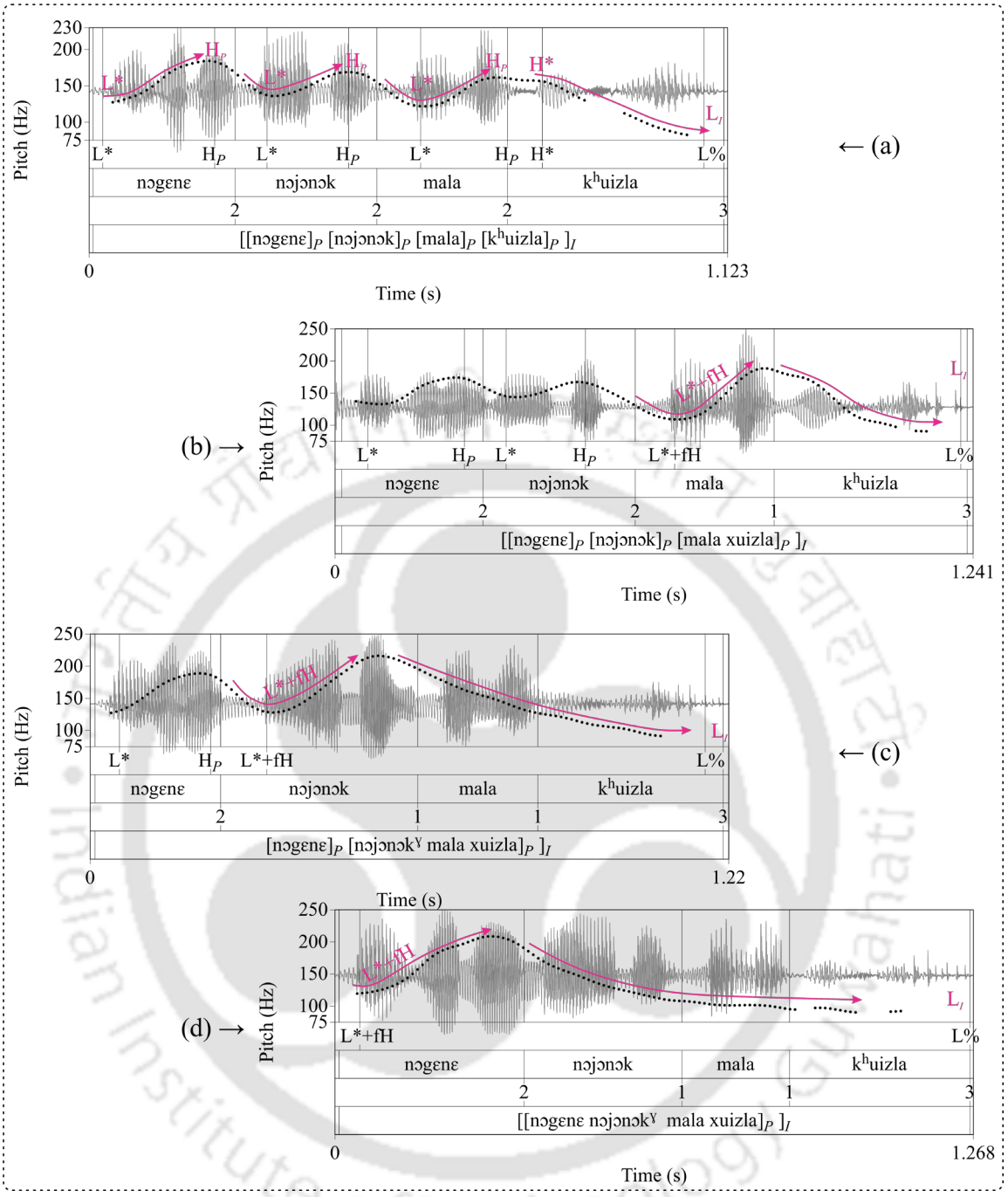


Figure 8-2 The panels given in (a) to (d) correspond to the NVA IPs given in (5) to (8) respectively. As opposed to the WF rendering in (a), in the rest of the panels, the CF is on the first, second and third constituent respectively.

8.2.2 Post-focused constituent

A corollary to the difference in CF marking in SCA and NVA is the difference that the two varieties maintain in their phonological representation of the post-focus pitch compression. In contradiction to complete PRC of the post-focus sequence in SCA, we see

post-focus dephrasing in NVA. This variation in the treatment of the post-focus sequence is supported by segmental evidence, which has been discussed below.

In SCA, though the post-focus prosodic constituents undergo pitch compression, they show a proneness to retain their prosodic phrasing intact. Here SCA is comparable to Japanese (Sugahara, 2005), where the post-focus sequence instantiates pitch range compression without affecting the prosodic phrasing of the sequence. As it has been elaborated in chapter 4 that the prosodic boundaries among prosodic phrases realised in WF condition are retained even in post-focus environment. The existence of these boundaries are supported by both segmental cues (see §4.3.5) as well as phonetically (see §4.4.2).

Post-focal PRC has been briefly demonstrated below with the help of the IPs given in (9-11).

SCA IP

9) L* H_P L* H_P L* H_P L_I
[[mad^{h}ɔb]$_P$ [kɔmɔla k^{h}a-bo-loi]$_P$ [k^{h}ɔgɛn-ɔr g^{h}ɔr-ɔloi]$_P$ [go-is-ɛ]$_P$]$_I$ **WF** ←
[x] [k^h] [ɔ] [ɣ]

Madhab orange eat-FUT-DAT Khagen-GEN house-DAT go-PST-3

Madhab went to Khagen's house to eat oranges

10) L* fH_P L_I
[[**mad^{h}ɔb**]$_P$ [kɔmɔla k^{h}a-bo-loi]$_P$ [k^{h}ɔgɛn-ɔr g^{h}ɔr-ɔloi]$_P$ [go-isɛ]$_P$]$_I$
[x] [k^h] [ɔ] [ɣ]

11) L* H_P L* H_P L* fH_P L_I
[[mad^{h}ɔb]$_P$ [kɔmɔla] **[k^{h}a-bo-loi]**$_P$[k^{h}ɔgɛn-ɔr g^{h}ɔr-ɔloi]$_P$ [go-isɛ]$_P$]$_I$ **CF** ←
[k^h] [k^h] [ɔ] [ɣ]

Among the three IPs given above (9) is the WF variant, which has four P-phrases: *mad^{h}ɔb*, *kɔmɔla k^{h}aboloi*, *k^{h}ɔgɛnɔr g^{h}ɔrɔloi*, and *goisɛ*. All these P-phrases are demarcated by prosodic boundaries on both sides, and these boundaries in turn block any segmental processes to take place across the phrases. For instance, while the word initial [k^h] of *k^{h}aboloi* spirantises to [x], the [k^h] of *k^{h}ɔgɛnɔr* is produced as an aspirated velar stop. In the former case, [k^h] gets an intervocalic environment P-phrase internally, and in the latter case, [k^h] is separated from the preceding vowel by a P-phrase boundary tone. Moreover, the initial [g^h] of *g^{h}ɔrɔloi* spirantises to [ɣ] since it gets an intervocalic environment due to the phrase internal /r/ deletion.

In case of (10), which is realised with CF on the first constituent *mad^{h}ɔb*, the occurrences of intervocalic [k^{h}] and [g^{h}] spirantisation discussed in the preceding paragraph, are not affected. Similar to (9), in (10) the [k^{h}] is produced as an aspirated velar stop. This testifies the existence of phrase level prosodic boundaries among the post-focus constituents. Further, in case of (11), where the CF is on *k^{h}aboloi*, the initial [k^{h}] of *k^{h}ɔgɛnɔr* does not undergo spirantisation marking the presence of a prosodic boundary to its left. The intonational manifestations of (9) to (11) have been given in the panels (a) to (c) respectively of Figure 8-3. The prosodic phrasing and the segmental changes, sensitive to prosodic boundaries, have been reported in the fourth tier of each panel.

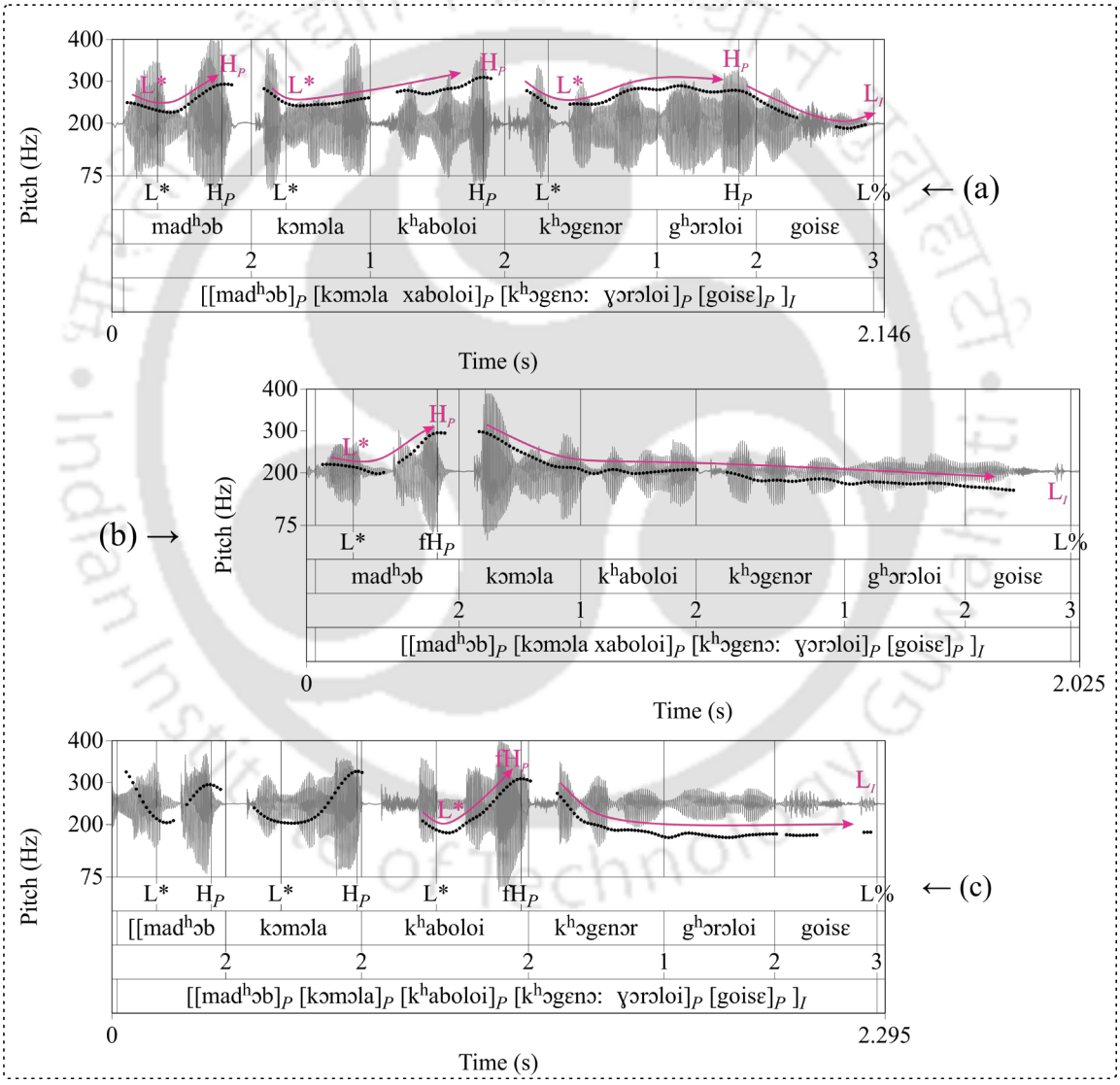


Figure 8-3 The panels given in (a) to (c) correspond to the SCA IPs given in (9) to (11) respectively. As opposed to the WF rendering in (a), in (b) and (c), the CF is on the first and the third constituent respectively. Varied focus realisation, however, does not change P-phrasing in the post-focus sequence.

In NVA, on the other hand, the post-focus sequence experiences dephrasing, and it is included in the CF initiated P-phrase. Since dephrasing deletes the prosodic boundaries among the constituents in the sequence, various segmental processes are accommodated across the constituents (see §5.2.3). The CF pitch accent L*+fH on the focused constituent is the prosodic head of the entire string comprising the focused and post-focus constituents. The NVA variants of the SCA IPs given in (9) to (11) have been demonstrated below in (12) to (14), which evidence post-focus dephrasing.

NVA IP

L* H_P L* H_P L* H_P L* H_P H* L_I
12) [[mad^{h}ɔb-ɛ]$_P$ [kɔmla k^{h}a-ba]$_P$ [k^{h}ɔgɛn-ɔr]$_P$ [g^{h}ɔr-ɔt]$_P$ [ge-isi]$_P$]$_I$ **WF** ←
[x] [k^h]

Madhab-NOM orange eat-DAT Khagen-GEN house-DAT go-PST3

Madhab went to Khagen's house to eat oranges

L*+fH$_P$ L_I
13) [[**mad^{h}ɔb-ɛ** kɔmla k^{h}a-ba k^{h}ɔgɛn-ɔr g^{h}ɔr-ɔk ge-si]$_P$]$_I$ **CF** ←
[x] [x] [g] [g]

L* H_P L* H_P L*+fH$_P$ L_I
14) [[mad^{h}ɔb-ɛ]$_P$ [kɔmla] **[k^{h}a-ba** k^{h}ɔgɛn-ɔr g^{h}ɔr-ɔk ge-si]$_P$]$_I$
[k^h] [x] [ɣ] [g]

The WF declarative IP (12) demonstrate LH melody on non-final P-phrases, which are designated by L*H$_P$ pitch specification, and a falling contour on the final P-phrase specified by H*L$_I$ tonal pattern. As shown in the schema, [k^h] spirantisation is accommodated and blocked within and across P-phrase boundaries respectively. When we consider (13), which bears CF on the IP initial constituent *mad^{h}ɔbɛ*, we can see that the entire post-focus sequence behaves as a P-phrase together with the focused constituent. This is supported by the way intervocalic spirantisation is allowed across constituents in the post-focus sequence. Further, when *k^{h}aba* receive CF in (14), the word initial [k^h] of the constituent does not spirantise since it is demarcated to its left by the CF induced prosodic boundary; however, intervocalic spirantisation is permitted across the constituents following *k^{h}aba*. The intonational contours of the IPs (12) to (14) have been demonstrated in the panels (a) to (c) respectively in Figure 8-4.

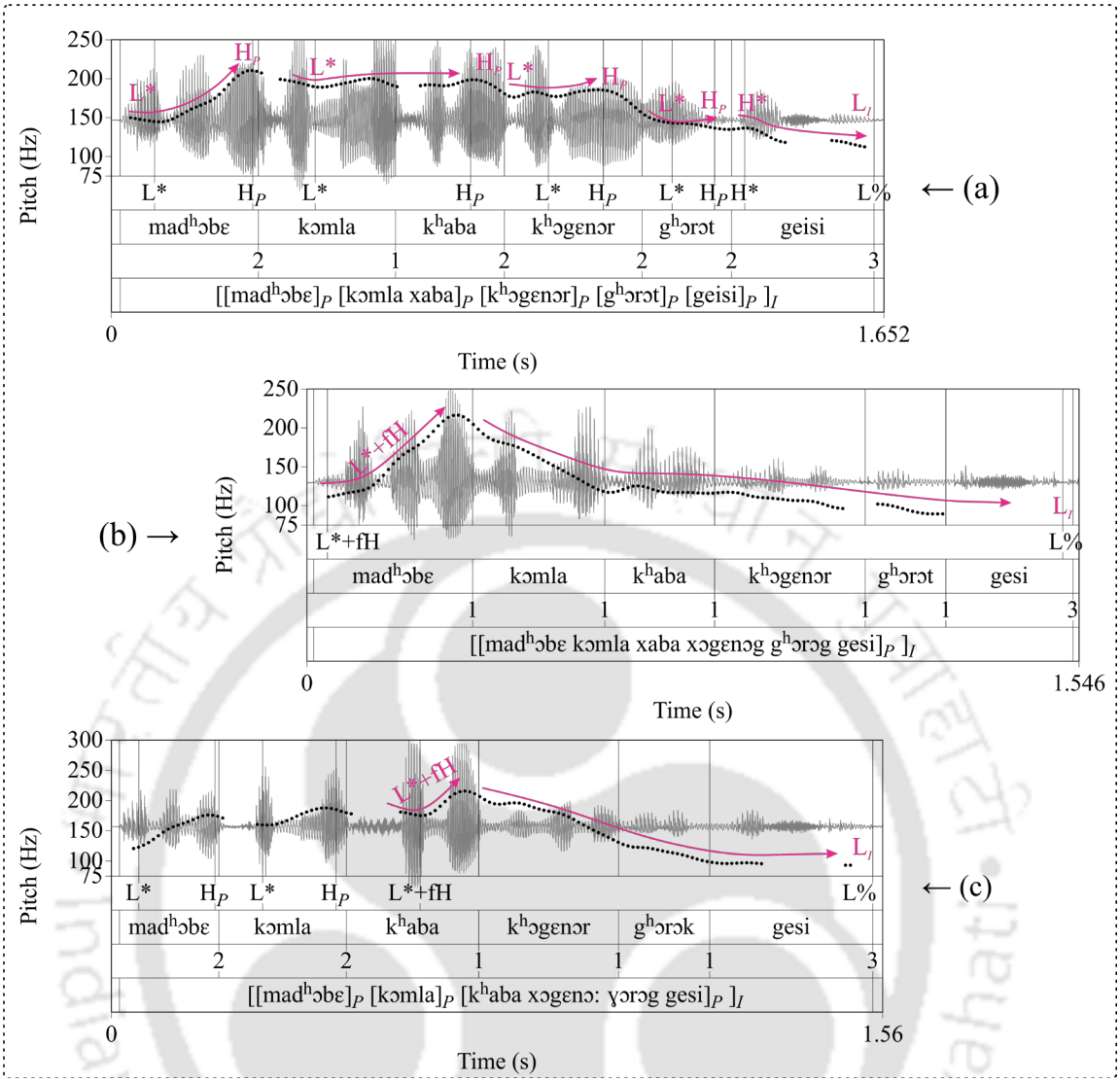


Figure 8-4 The panels given in (a) to (c) correspond to the SCA IPs given in (12) to (14) respectively. As opposed to the WF rendering in (a), in (b) and (c), the CF is on the first and the third constituent respectively. By initiating dephrasing, CF removes the phrase boundaries among post-focus constituents.

In the annotated IPs in Figure 8-4, the segmental changes taking place due to post-focus dephrasing in NVA have been reported in the fourth tier of the text-grids. The sequence of focused and post-focus constituents constitute a P-phrase designated by L*+fHL$_I$.

8.3 MF in SCA and NVA

After a comparative discussion on CF realisation in SCA and NVA, in this section, MF realisation in the two varieties will be compared. MFMs in both varieties are assigned prominence lending high focus pitch accent fH* (see chapter 6 and 7 for details). However,

the two varieties incorporate MFMs into the prosodic structure differently: while SCA treats MFMs as free clitics, NVA treats them as affixal clitics. In their right as free clitics, MFMs in SCA form P-phrases in combination with their hosts, whereas in NVA, MFMs form P-words together with their hosts, which are minimally P-words. This basic difference in the treatment of MFMs between the two varieties gets reflected in the intonational realisation as well.

8.3.1 Focused constituents

In SCA, since host=MFM combinations need to constitute P-phrases, the focused constituent together with the MFM forms a prosodic domain demarcated by prosodic boundaries on both sides. Such MF initiated prosodic domains are characterised by LfH* pitch pattern.

In contrast to SCA, host=MFM combinations in NVA form P-words, and as such they are not demarcated by P-phrase boundaries on both sides. It is only to the left of the focused constituent that a prosodic boundary is initiated. Since the right edge of the host=MFM construct is left unmarked, the construct constitutes a P-phrase conjointly with the constituents following it.

In order to make the difference between MF realisations in the two varieties of Assamese clear, few declarative sentences from both varieties and their intonational contours have been exemplified below.

SCA IP

15)
L* H_P L* H_P L* H_P L_I
[[nɔgɛn-ɛ]$_P$ [nɔjɔn-ɔk]$_P$ [mala]$_P$ [k^huz-il-ɛ]$_P$]$_I$ ← **WF**
Nagen-NOM Nayan-ACC garland ask-PST-3
Nagen asked Nayan for a garland.

16)
L* H_P L* H_P L fH* L_I
[[nɔgɛn-ɛ]$_P$ [nɔjɔn-ɔk]$_P$ **[mala=hɛ]**$_P$ [k^huz-il-ɛ]$_P$]$_I$ ← **MF**
Nagen-NOM Nayan-ACC **garland=only** ask-PST-3
Nagen asked Nayan only for a garland.

17)
L* H_P L fH* L_I
[[nɔgɛn-ɛ]$_P$ [**nɔjɔn-ɔk=hɛ**]$_P$ [mala]$_P$ [k^huz-il-ɛ]$_P$]$_I$ ← **MF**
Nagen-NOM **Nayan-ACC=only** garland ask-PST-3
Nagen asked only Nayan for a garland.

L* H_P L fH* L_I

18) [[**nɔgɛn-ɛ=hɛ**]$_P$ [nɔjɔn-ɔk]$_P$ [mala]$_P$ [k^{h}uz-il-ɛ]$_P$]$_I$ ← **MF**

Nagen-NOM=only Nayan-ACC garland ask-PST-3

Only Nagen asked Nayan for a garland.

The intonational contours of the SCA IPs with MF given in (15) to (18) have been displayed in panel (a) to (d) respectively of Figure 8-5.

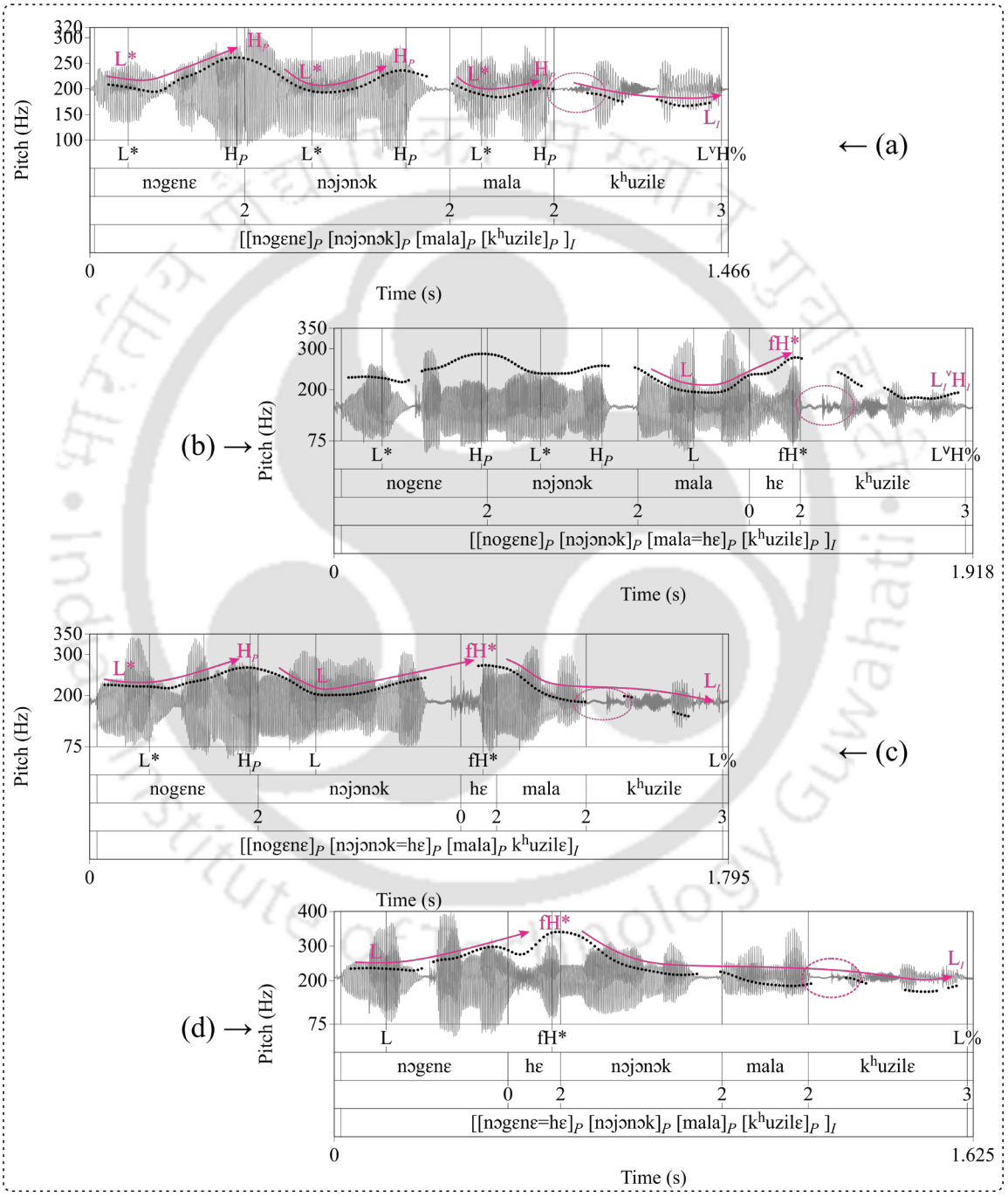


Figure 8-5 The panels given in (a) to (d) correspond to the SCA IPs given in (15) to (18) respectively. As opposed to the WF rendering in (a), in the rest of the panels, the MF is on the third, second and first constituent respectively.

The intonational contours in Figure 8-5 demonstrate how constituents with MF form phrases at the prosodic level and are specified with LfH* pitch pattern. MF induced P-phrases are always characterised by greater pitch excursion, and they always block the downstepping trend of boundary peaks normally seen in SCA declarative IPs. As can be seen in panel (b) and (c), the peak realised on the right edge of focused constituents is greater than the one on the preceding P-phrase.

NVA variants of the above mentioned SCA IPs have been given below in (19) to (22); which are followed by their intonational realisations in panel (a) to (d) respectively of Figure 8-6.

NVA IP

19) L* H_P L* H_P L* H_P H* L_I
[[nɔgɛn-ɛ]$_P$ [nɔjɔn-ɔk]$_P$ [mala]$_P$ [k^huiz-lak]$_P$]$_I$ ← **WF**
Nagen-NOM Nayan-ACC garland ask-PST3
Nagen asked Nayan for a garland.

20) L* H_P L* H_P L fH* L_I
[[nɔgɛn-ɛ]$_P$ [nɔjɔn-ɔk]$_P$ [**mala=hɛ** k^huiz-lak]$_P$]$_I$ ← **MF**
Nagen-NOM Nayan-ACC **garland=only** ask-PST-3
Nagen asked Nayan only for a garland.

21) L* H_P L fH* L_I
[[nɔgɛn-ɛ]$_P$ [**nɔjɔn-ɔk=hɛ** mala k^huiz-lak]$_P$]$_I$ ← **MF**
Nagen-NOM **Nayan-ACC=only** garland ask-PST-3
Nagen asked only Nayan for a garland.

22) L fH* L_I
[[**nɔgɛn-ɛ=hɛ** nɔjɔn-ɔk mala k^huiz-lak]$_P$]$_I$ ← **MF**
Nagen-NOM=only Nayan-ACC garland ask-PST-3
Only Nagen asked Nayan for a garland.

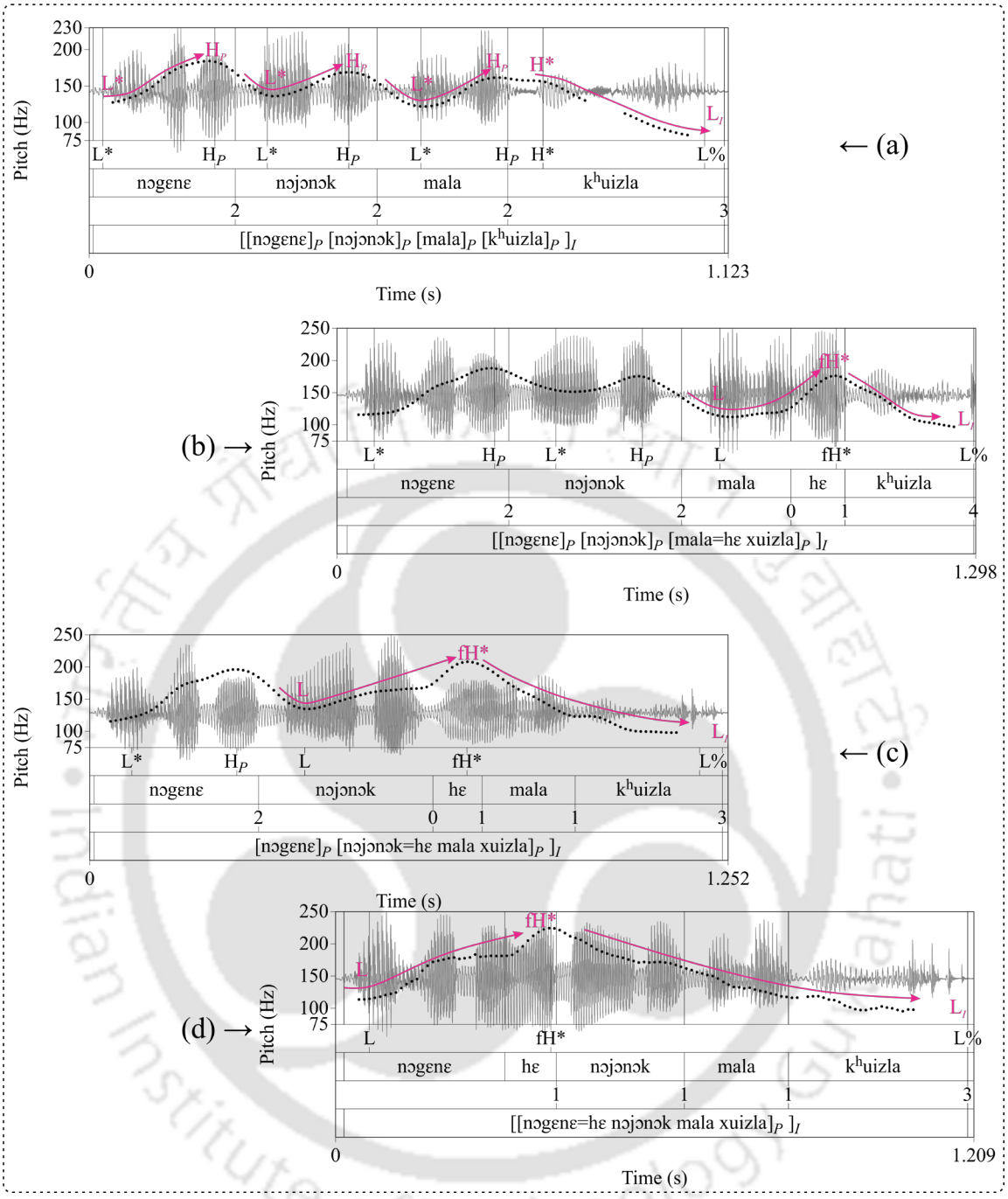


Figure 8-6 The panels given in (a) to (d) correspond to the SCA IPs given in (19) to (22) respectively. As opposed to the WF rendering in (a), in the rest of the panels, the MF is on the first, second and third constituent respectively.

MF constituents in NVA, though similar to their SCA counterparts, are characterised by LfH* pitch specification and block IP internal downtrend, they do not constitute an individual prosodic domain on their own. Such constituents are prosodically demarcated only on their left edge.

8.3.2 Post-focus constituents

Different phonological marking of MF constituents in the two varieties result in a different phonological representation of the post-focus sequence. Though the post-focus constituents in both varieties experience PRC, the phonology of this compression is different. Since the host=MFM combination needs to constitute a P-phrase in SCA, it cannot form a P-phrase together with the post-focus constituents and thus dephrase them. Further, the evidence of prosodic boundaries among post-focus constituents comes from the blocking of segmental processes such as intervocalic spirantisation etc. In Figure 8.5, it can be seen that the word initial [k^h] of *k^huzilɛ* is realised as an aspirated velar stop irrespective of MF realisation. In all the panels in the Figure, *k^huzilɛ* retains its left-edge prosodic boundary.

In NVA, on the other hand, the assumption that the host=MFM combination forms a P-word is supported by the way it forms a P-phrase together with the constituents following it. This post-focus dephrasing is supported by the presence of segmental processes like intervocalic spirantisation across the post-focus constituents. For instance, in Figure 8-6, unlike SCA, the word initial [k^h] of *k^huizlak* consistently spirantises to [x] whenever it follows MF (panel (b-d)). If we assign P-phrase status to the combination in NVA, such post-focus dephrasing will not be theoretically possible. [k^h] spirantisation is, however, blocked in the WF rendering given in panel (a) of Figure 8-6 since it is preceded by a P-phrase boundary.

In SCA, the most prominent pitch accent fH* realised on the MFM is the prosodic head of the focused constituent, and it exercises a complete PRC on the post focus sequence. In NVA, on the contrary, the high focus pitch accent fH* on the MFM is the prosodic head of the entire focused and post-focus string of constituents.

8.4 Discussion

In the above sections, it can be seen that SCA and NVA adopt typologically different strategies of focus marking. Firstly, while SCA adopts a two-sided demarcation of focused constituents like Kolkata Bengali (Hayes & Lahiri, 1991; Lahiri & Fitzpatrick-Cole, 1999), NVA, identical to Korean (Jun & Lee, 1998), induces prosodic boundary only to the left of such constituents. Secondly, while SCA, like Japanese (Sugahara, 2005), wields complete PRC on the post-focus constituents, NVA dephrases them like it is in Korean

(Jun & Lee, 1998). Finally, in SCA the focused constituent forms an independent prosodic domain which accommodates segmental processes like /r/ deletion, intervocalic spirantisation, etc. domain internally and blocks beyond it; whereas in NVA, the focused constituent forms a P-phrase together with the post-focus constituents. This prosodic domain permits various segmental processes such as /r/ assimilation, intervocalic spirantisation, etc.

The process of intonational and prosodic marking of CF and MF in SCA and NVA has been schematically demonstrated in Figure 8-7 with the help of prosodic hierarchy trees. The trees analyse the SCA and NVA variants of the IP *nɔgɛnɛ nɔjɔnɔk mala kʰuzilɛ* in different focus conditions.

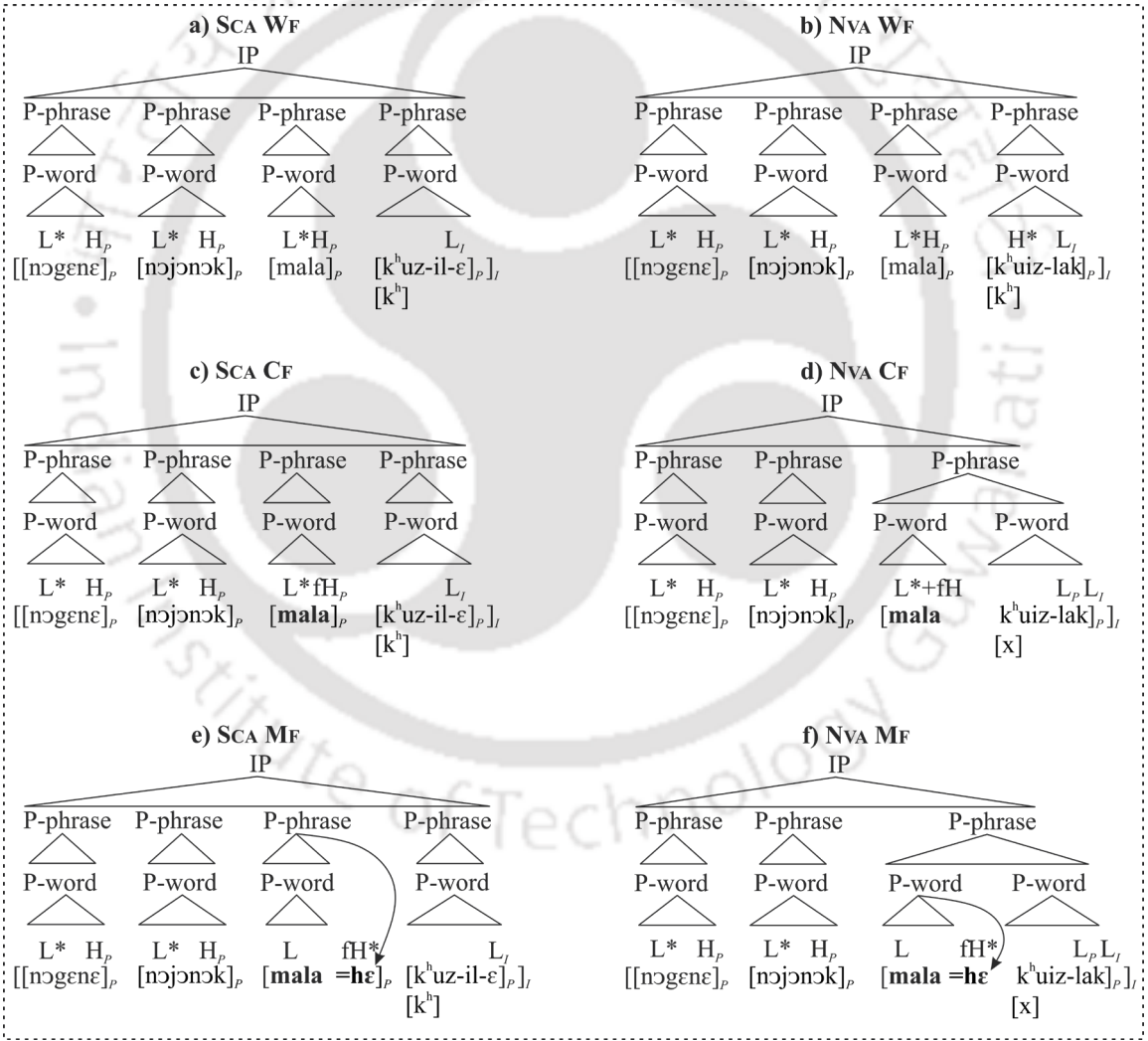


Figure 8-7 Schematic presentation of how WF (a-b), CF (c-d) and MF (e-f) interact with the prosodic structure of declarative IPs in SCA and NVA.

In Figure 8-7, panel (a) and (b) illustrates the default prosodic structure of declarative IPs in SCA and NVA respecetively, where an IP is exhaustively parsed into P-phrases, and P-

phrases into P-words. In SCA, the final constituent lacks prominence, and hence not assigned pitch accent; however the existence of a prosodic boundary to its left is evident from the blocking of word initial [k^h] spirantisation of *k^{h}uzilɛ*. In NVA the final constituent receives H* pitch accent on its initial syllable since it does not lack prosodic prominence. NVA, similar to SCA, does not spirantise [k^h] of *k^{h}uizlak*.

As far as CF and MF realisations are concerned, in SCA, the focused constituent is dominated by an independent P-phrase node, whereas in NVA, the P-phrase node dominating the focused constituent also dominates the constituents following the constituent. This difference in prosodic dominance can also be traced by the way intervocalic [k^h] → [x] spirantisation is accommodated or blocked across post-focus constituents. Since in panel (c), *mala* forms a P-phrase, it blocks the intervocalic environment for [k^h] to spirantise in SCA. On the other hand, in panel (d), since the focused plus post-focus constituents are dominated by a single P-phrase node, intervocalic [k^h] → [x] is permitted.

Furthermore, in panel (e) and (f), it has been illustrated how MFMs are incorporated into the prosodic structure of an IP in SCA and NVA respectively. In panel (e), since in SCA MFMs are treated as free clitics, the host P-word and the MFM are dominated by a P-phrase node. In panel (f), the host=MFM construct is dominated by a P-word node since MFMs behave as affixal clitics in SCA.

8.5 Conclusion

The chapter provides a comparative summary of how CF and MF is realised in SCA and NVA. It has been shown that SCA adopts a two sided demarcative strategy to mark both CF and MF constituents, whereas NVA marks only the left edge of focused constituents. As against the complete post-focal PRC in SCA which does not necessarily initiate dephrasing, NVA dephrases the post-focus constituents into the one initiated by focus, and thus compresses both pitch and durational values of the post-focus constituents.

Chapter 9 Conclusion

In the dissertation, a study on intonational phonology and focus realisation in the two varieties of Assamese, namely, SCA and NVA has been reported. The primary aim of the dissertation was to explore the inventory of tones in the two varieties, define the characteristics of prosodic domains, and to investigate how focus is manifested in the varieties. Before making these investigations, the dissertation reports another study conducted to see word level prominence in SCA and NVA. In the sections to follow the major findings in this work have been briefed.

9.1 Word level prominence

The second chapter of this dissertation makes an investigation on the lexical prominence pattern in SCA and NVA from the moraic theory of metrical prominence. The findings in the chapter show that both varieties maintain a trochaic rhythm which is maintained at the moraic level, and applied from left to right direction. Both varieties strictly observe foot binarity, which makes it obligatory for each foot to contain two morae out of which the left one is always prominent. The leftmost syllable in a word is the most prominent syllable unless the second syllable is heavy and the first light. Since heavy syllables are bimoraic, and form feet, they are assigned lexical prominence. Heavy syllables always attract prominence unless there is prominence clash, since syllable level stress clash is avoided in the two varieties. Though both the varieties demonstrate a default word initial prominence pattern, in NVA this prominence pattern is more forceful which is augmented by such phonological processes as segmental deletion or addition and diphthongisation (§3.4).

9.2 Intonational phonology

One of the primary objectives of the dissertation was to investigate the prosodic structure and the tonal inventory of SCA and NVA. The third chapter discusses the prosodic structure of the two varieties, and proposes how this structure can be arranged in terms of a prosodic hierarchy tree. Both in SCA and NVA, the highest node in the hierarchy is that of IP, which may contain one or more P-phrases; P-phrases may be analysed into P-words. Among these prosodic constituents, IP and P-phrase are tonally characterised. P-phrases are the minimal units of tonal assignment which are specified by a prominence lending pitch accent on their leftmost prominent syllable and an edge marking boundary tone on their rightmost syllable. However, it is seen in case of SCA that this intonational

specification is not obligatory for P-phrases. For instance, final constituents in declarative IPs, though form P-phrases, lack phonological prominence and hence are not assigned any prominence lending pitch accents. Even in post-focus environment, constituents tend to retain their prosodic boundaries though they are intonationally underspecified. In case of NVA, P-phrases are obligatorily characterised by pitch accents since they never lack phrase initial prosodic prominence. For instance, in NVA declarative IPs, the final constituent is always designated by an H* pitch accent. Furthermore, the chapter provides tonal inventories of the two varieties and points out the differences between the two.

It has been further established in the chapter that intonational domains also behave as prosodic domains which accommodate various segmental processes such as /r/ deletion or assimilation, aspirate spirantisation, etc. Placing themselves as typologically similar to most other SALs viz. Bengali (Hayes & Lahiri, 1991; Khan, 2008), Hindi (Patil, et al., 2008), Tamil (Keane, 2014), etc., the two varieties exhibit repeated LH melody or repeated rising contours on the non-final constituents.

9.3 Focus

After a primary discussion on lexical prominence pattern and post-lexical prosodic structure in the second and third chapters, the subsequent chapters concentrated on the next major objective of the dissertation i.e. focus manifestation in SCA and NVA. There we extensively discussed how different types of focus realisation interact with the prosodic structure of declarative IPs in the two varieties. The fourth and the fifth chapter elaborate CF realisation and the sixth and the seventh chapter discuss MF realisation in SCA and NVA respectively.

9.3.1 CF

In SCA, constituents with CF always form P-phrases, and they are characterised by rising pitch contour. This rising contour is manifested due to the prominence lending L* pitch accent associated with the leftmost prominent syllable of the focused constituent and the right edge demarcating focus high boundary tone fH$_P$ realised on the final syllable. In NVA on the other hand, focused constituents are assigned a bitonal pitch accent L*+fH on the leftmost prominent syllable, and they form a composite P-phrase together with everything following it. Unlike SCA, there is no prosodic demarcation of the right edge of focused constituents in NVA.

Both SCA and NVA demonstrate post-focus pitch compression; while in SCA focus does not necessarily remove the prosodic boundaries among post-focus constituents, in NVA there is an obligatory deletion of phrase level prosodic boundaries within the post-focus sequence. This proposal was strengthened by segmental as well as durational cues. In SCA, focus does not seem to disturb the prosodic phrasing of the post-focus sequence, and consequently the post-focus constituents do not undergo durational reduction. In NVA, on the other hand, post-focus constituents undergo durational reduction since they are merged into the P-phrase initiated by CF. Schemata of CF realisation in SCA and NVA have been summarised in (1) and (2).

			L* H_P	L* fH$_P$	L_I
1)	SCA	→	[Pre-focus]$_P$	[Focused]$_P$	[Post-focus]$_P$]$_I$
			L* H_P	L*+fH	L_I
2)	NVA	→	[Pre-focus]$_P$	[Focused	Post-focus]$_P$]$_I$

9.3.2 MF

In the subsequent two chapters, the concentration was on MF realisation in the varieties. There it has been proposed that, apart from prosodic marking of focus, the studied varieties employ MFMs in order to highlight an informationally important constituent. The two chapter categorised MFMs in SCA and NVA as free clitics and affixal cltics respectively. MFMs constitute P-phrases in SCA together with their hosts, whereas in NVA, the P-word=MFM combination constitutes another P-word[45].

Both varieties characterise MFMs with a high focus pitch accent fH*, which induces greater pitch value on MFMs. However, due to lack of evidence, any lexical origin of the pitch accent has not been claimed in the present work. The motivation in support of assigning high pitch accent to MFMs was drawn from the exceptional rise seen on MFMs which obligatorily blocks IP internal left to right downstepping of P-phrases. Identical to CF manifestation, MFM adjoined constituents form P-phrases in SCA which are designated by two pitch accents L and fH*. Out of these two pitch accents, the former is

[45] In the present data set it has been observed that in SCA, host=clitic combinations always constitute P-phrases whereas in NVA, such combinations are parts of a larger P-phrase. In the former, the host=clitic combination coincides with P-phrase boundaries on both sides, while in the latter the combination left-aligns to a phrase boundary.

associated with the leftmost prominent syllable of focused constituents and the latter is associated with MFMs. In case of NVA, the pitch accent realised on MFMs is the head of MFM initiated P-phrases, which include both focused and post-focus constituents together. MF realisation in the two varieties proposed in this dissertation has been schematically presented below in (3) and (4).

			L* H_P		L fH*		L_I
3)	SCA	→	[Pre-focus]		[Focused]$_P$	[Post-focus]$_P$]$_I$	
			L* H_P		L fH*		L_I
4)	NVA	→	[Pre-focus]		[Focused	Post-focus]$_P$]$_I$	

In chapter 6 and 7, it has been proposed that MFMs in both SCA and NVA derive H* pitch accent at the post-lexical level as opposed to the view that H* is lexically assigned. However, the different predictions made by the two different approaches - one as a lexical H* and other, that of a post-lexical one needs to be studied in greater detail.

In chapter 8, a comparative analysis of different types of focus realisation in SCA and NVA was provided.

9.4 Comparison with other SALs

In the present work, it has been found and shown that both SCA and NVA maintain a close affinity with other SALs like Bengali, Hindi and Tamil as far as the prosodic structure and intonational phonology is concerned. Like SALs, both these varieties demonstrate repeated rising contours or LH melody on non-final P-phrases. P-phrases demonstrated in the two varieties behave identical to P-phrases reported in Kolkata Bengali (Hayes & Lahiri, 1991) and Hindi (Patil, et al., 2008), and APs in Bangladeshi Bengali (Khan, 2008) and Tamil (Keane, 2014).

SCA shows a proximity to Kolkata Bengali (Hayes & Lahiri, 1991; Lahiri & Fitzpatrick-Cole, 1999) and Hindi (Patil, et al., 2008) since it demarcates focused constituents initially and finally at the prosodic level. In SCA, when constituents are focused, they receive low pitch accent (L*) and focus high boundary tone (fH$_P$). CF marking in NVA, on the other hand, demonstrates affinity to Bangladeshi variety of Bengali (Khan, 2008; 2014) and Korean (Jun & Lee, 1998). Like these languages, the focused constituent in NVA forms a P-phrase together with the post-focus sequence of constituents. NVA highlights focused constituents with bitonal focus pitch accent

(L*+fH), which heads the succeeding sequence of constituents. As far as the pre-focus constituents are concerned, both varieties behave in an identical manner. They display an optional tendency to place the pre-focus constituents under a single P-phrase node. With longer pre-focus sequences, such phrasing may not be observed.

SCA and NVA are further found to marginalize the post-focus sequence by radically compressing the pitch variation in the sequence. Post-focus pitch compression has been reported in SALs like Bangladeshi (Khan, 2008) and Kolkata (Hayes & Lahiri, 1991; Lahiri & Fitzpatrick-Cole, 1999) Bengali and Korean (Jun & Lee, 1998). However, there are languages like Hindi (Patil, et al., 2008; Genzel & Kügler, 2010) and Tamil (Keane, 2014), where such compression has not been reported. However, SCA and NVA adopt different phonological strategies to address the pitch compromise following CF. With regards to PFC, SCA can be compared with Japanese (Sugahara, 2005) which demonstrates PFC without compromising phrase boundaries in the post-focus domain. This is further supported by an instrumental experiment conducted by Twaha and Mahanta (2016) which reveals that in SCA, post-focus P-phrases do not maintain significant durational difference from their WF realizations. Even P-phrase final syllables do not undergo significant duration change. As opposed to complete PFC of pitch in SCA, CF dephrases the constituents occurring after the focused constituent in NVA; the entire post-focus string merges into the CF initiated P-phrase.

9.5 Implications of the current research and future directions

The findings of the current study adds up to the bulk of research undertaken on intonational phonology and focus prosody in SALs. There have been studies in these areas on SALs like Bengali (Hayes & Lahiri, 1991), Hindi (Patil, et al., 2008; Genzel & Kügler, 2010), and Tamil (Keane, 2014). This dissertation is the first study on Assamese which proposes an intonational model for two of its varieties, SCA and NVA. This dissertation establishes that Assamese is typologically similar to the other SALs, in that it is characterised by repeated rising contours on non-final constituents. Like SALs, it is the contour shape on the final constituent that determines the sentence type in the two studied varieties.

The dissertation provides information regarding how focus is manifested in Assamese with reference to SCA and NVA. The findings show that the two varieties maintain differences from each other in focus marking and post-focus compression. In spite of their differences, SCA and NVA share similarities with other SALs. Both varieties

designate focus with rising contours, and the high tone realised on focused constituents is phonetically characterised with greater pitch value. With regards to post-focus pitch focus compression, the studied varieties are comparable to Bengali.

Furthermore, the present work undertakes experiments in order to investigate phonetic cues to CF and MF. Focused constituents always show greater pitch rise compared to their WF renderings. These experiments revealed that in SCA CF manifestation, post-focus durational reduction is not statistically significant, whereas in NVA this reduction is always significant. As against the tendency in SCA to retain the prosodic phrasing structure of the post-focus sequence, in NVA dephrasing of the sequence has been proposed.

Findings of the present study are based on different production experiments conducted on native speaker. These findings can be buttressed further if they are aided by perception experiments in future. For instance, both SCA and NVA demonstrate L*H_P and L*+HH_P tonal patterns on non-final P-phrases. In order to ascertain that these tonal specifications represent phonologically distinct tonal patterns rather than mere phonetic variations, perception tests may be conducted.

List Of Presentations And Publications

Presentations

- Workshop on Tone and Intonation: Theory, Typology and Computation organized by IITG on 26th and 27th January'2012. Title of the paper presented: Focus and Word-order in the Nalbariya variety of Assamese.
- The 7th International Conference of the NEILS held on February 2nd-February 4th 2012. Title of the paper presented: The Phonology of Focus in two varieties of Assamese.
- (With S. Mahanta) The 14th Annual Conference of the International Speech Communication Association held on 26th – 29th August 2013.
- (With S. Mahanta) Workshop on prosodic variation, Pro-Var, July 9th, 2015. Title of the paper presented: Prosody of contrastive focus in two varieties of Assamese (poster presentation)
- (With S. Mahanta) 2015 Annual Meeting on Phonology in Vancouver, B.C., Canada, held on October 9-11, 2015. Title of the paper presented:The phonology of contrastive focus in Standard Colloquial Assamese
- (With S. Mahanta) Workshop on Tone and Intonation 3 organized by IITG on 7th and 8th January, 2016. Title of the paper presented: "Intonational and Prosodic Structure of Standard Colloquial Assamese"
- (With S. Mahanta) Formal Approaches to South Asian Languages (FASAL) 6 organised by UMass Amherst on 12th and 13th March, 2016. Title of the paper presented: "Morphological Focus Marking in Standard Colloquial Assamese"
- (With S. Mahanta) 5th International Symposium on Tonal Aspects of Language (TAL 2016) organised by University of Buffalo from 24th-27th May, 2016. Title of the paper presented: "Phonetic cues to contrastive focus in Standard Colloquial Assamese"

Publications

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