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BANGLA GENITIVIZATION AND VOWEL SYNCOPE: AN ANALYTICAL STUDY OF THE ROLE OF PROSODY

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ABSTRACT

Applying the framework of moraic theory proposed by Hayes (1987, 1995), the paper analyses theoretically non-specific Bangla genitives with monosyllabic and disyllabic stems. The primary objective here is to offer some insights into the patterns of vowel syncope and other forms of reduction induced by the case marker /er/ 'of sth/sbd', when affixed to Bangla open stems (mono- or disyllabic). Interestingly these strategies involving reduction and syncopation can affect the phonological structure of either the stem coming under inflection or the case-marker itself, but never both simultaneously. While glide-formation (that is another phonological process triggered by the non-specific genitives) never affects the structure of stems, syncope mostly affecting the disyllabic word-final vowel perfectly maintains the preferred trochaic pattern. But the problem arises when the stem-final vowel is /o/, because its syncopation or preservation is highly context-dependent, even regulated by morphology, vowel harmony, input-output parity etc. The paper has done a thorough analysis of different cases of Bangla non-specific genitivization, and with the help of theories of prominence and moraic syllable weight has explained the prosodic motivations behind phonetic reduction often realized as vowel syncopation.

Key Words: Bangla Case, Non-specific Genitive, Case-marker, Syllable Weight, Vowel Deletion.

Discussion

Cases are traditionally described as 'a system of marking dependent nouns for the type of relationship they bear to their heads' (Blake 1994). With a very few exceptions, world languages mostly prefer suffixes to prefixes as positive case markers for both nouns and pronouns that undergo such affixation. Even in exceptional cases, a prefixal possessive marker is attested either as an additional element to occur along with the dominant suffix or permissible on many other conditions restricting its frequency (Lichtenberk 2009: 254). Complying with the general phenomenon observed in possessive affixation, Bangla allows only suffixes but bans prefixes consistently across all the varieties. The pattern for singular non-specific noun undergoing case inflection is uniform—/er/ being the only case marker. Unlike the plural forms, it

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never depends on the noun's degree of animacy. It means, of the singular non-specific nouns, the marker doesn't distinguish between the human and non-human (whereas it's often distinguished in plural *e.g.* /c^{h}eleder/ *'of the boys'* vs. */rastader/ *'of the roads'*).

Case inflections are potential sources of acoustic or phonological alternations of vowels in many languages. As an example, in its genitivization process Bangla displays different vowel alternations like glide formation, merger, epenthesis, phonetic reduction (even syncope as an extreme form of this), triggered by the singular case-marking inflection /er/ for non-specific nouns. Interestingly these processes can affect the phonological structure of either the stem coming under inflection or the case-marker itself, but never both simultaneously.

Primarily it can be said that while in case of genitivization of open-ended monoyllables glide-formation is mandatory, it is not so in open disyllables that often deploy vowel syncope to avoid hiatus. The general pattern is like the following:

Domain (Open Stem	**Concatenated Context V/V̯V̯# + /er/ (Suffix)**	**Alternation Strategy**	**Specification**
Monosyllabi	/CV.e/	Glide Formation	Direct Onset Formation
Mono-/Di-syllabic	/VV̯.e/ or /V.CVV̯.e/		Coupled with Merger
Disyllabic	/V.CV.e/	Vowel Reduction	Syncope (in the Stem)
			Syncope (in the Suffix)

Table 1: General Pattern of Bangla Genitivization-induced Alternations

The following table summarizes, with the help of examples, the different ways the strategies of hiatus blocking in Bangla genitive case inflection occur:

		Monosyllabic stem	Genitives
Open	Monophthong final	/ca/ 'tea'	/cajer/
	Diphthong-final	/cau/ 'chow'	/cawer/
Closed (with a coda		/cal/ 'rice'	/caler/

Disyllabic stem	Genitives
/bac^{h}a/ 'kid'	/bac^{h}ar/
/bac^{h}ai/ 'selection'	/bac^{h}ajer/
/bacal/ 'th talkative'	/bacaler/

Table 2: Syllable Structure, Count and Hiatus in Bangla Genitivization-induced Alternations

It is evident that, any open monosyllabic stem (dominated by primary prominence) is resistant to vowel reduction that affects only the non-prominent slots. As in Bangla, primary prominence is mostly on the first syllable (Chatterji 1926, 1970, 1993, Hayes & Lahiri 1991, Das Mandal *et al.* 2002, 2007), a disyllable (closed or open with a diphthong) constitutes a lexical trochee [σ'.σ] with the non-prominent syllable to

trail. But still this weak trailing syllable also can block reduction through moraic heaviness. Only a disyllable open with a monophthong can lead to vowel reduction (mostly syncope), while undergoing genitivization. Through the analysis of more data on open disyllabic stems, the current paper aims at finding out a definite pattern, if any, of any vocalic change at the phonological level induced by genitivization.

The default genitivizing suffix being /er/, there is formation and epenthesis of glide in genitivizing the monophthong-final monosyllabic stems like /ca/, both glide formation and merger in genitivizing a diphthong-final stem—monosyllabic /cau/ or disyllabic /bac^{h}ai/, and vowel syncope in genitivizing the monophthong-final disyllabic stems like /bac^{h}a/. However, any such process is blocked by the coda in a monosyllabic or disyllabic stem. The coda creates V-to-V distance after affixation, thereby avoids hiatus condition. Given this pattern of genitivization-induced vowel change, this article would concentrate on two basic research questions:

[a] when does vowel syncope come into effect? Does it take place only to avoid hiatus?

[b] In disyllables, where does the stem undergo vowel syncope, where else does the suffix, and why so?

Previous studies on Bangla case inflections and consequent vowel alternations are mainly a corpus-based cataloguing of pre- and post-alternation forms of vowels. The present study, limited to the scope of genitivized disyllables and trisyllables (non-specific and singular), posits to explain the prosodic motivations behind. Couched in the framework of stress and moraic theory (Hayes 1987, 1995), it aims at finding a definite pattern of phonological alternation, if any.

Bangla, a major Indic language spoken in Bangladesh and some Eastern Indian states, is a toneless, syllable-timed language (Dan 1992, Ghosh 1996), where syllable structure and weight hold key to many of the vowel alternation processes. Prosodically, it has a very weak lexical stress system that is quantity-sensitive. Standard colloquial Bangla (SCB) displays, following the common Germanic stress system, chiefly a system of left-dominant trochaic parsing invariably with final stresslessness in the word domain, as Hung (1993) argued. In spite of a sharp preference for lexical trochees, for maintaining its rhythmic pattern, Bangla can hardly depend on its weak lexical stress system that is too much mora-centric. That's why, apart from the 'lexical trochee' (Figure 1a.) and 'syllabic trochee' (Figure 1b.) that are independent of mora count, Bangla phonology frequently resorts to the other resources like 'moraic trochee' (Hayes 1995):

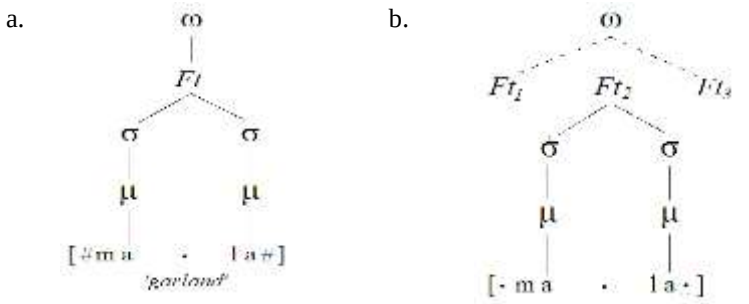


Figure 1: Lexical Trochee versus Syllabic Trochee

Both these trochees (Figure 1) are assigned two syllables at the minimum (stress on the first), but the lexical trochee, unlike the syllabic one, is ideally bracketed by word boundaries. Keeping the same leftward stress pattern, the third kind of trochee is assigned (rather than two syllables necessarily) two moras that are the units of weight, borne by segments except onset. The concept of 'moraic trochee' is founded upon the light-heavy contrast in syllable structures that typically characterizes the rhythmic character of Bangla. Therefore, few linguists like Faenhdrich (2005) called it mora-timed language to some extent.

A moraic trochee can consist even of a single syllable if it is heavy (*i.e.* bearing more than one mora). In Bangla this monosyllabic heaviness can be ensured by allophonic vowel lengthening in an open monosyllable (Figure 2a.), a diphthong (Figure 2b.), or a single vowel plus a coda (Figure 2c.).

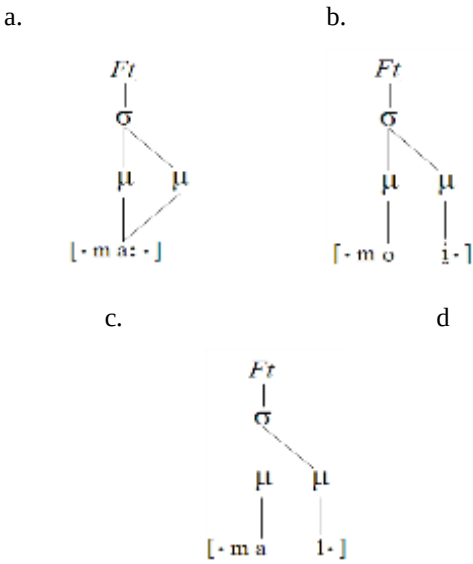


Figure 2: Types of Moraic Trochee

A syllabic trochee (involving two syllables) may be called a moraic trochee also, if both the syllables are light with one mora each (compare Figures 1b. and 2d.). By impacting the syllable count or mora count, suffixation or vowel syncope in Bangla is often a potential threat to the inherent trochaic rhythm. Bangla case inflection and the resultant vowel alternation pattern can be best understood through an analysis of the problem in the framework of moraic theory, because it explains as to how the language maintains its rhythm employing different strategies.

As regards the relationship factor Blake (1994) spoke of, through the genitive case marker /er/ inflected to the preceding noun that is non-specific and singular, Bangla expresses its possessive relationship with the following head, *e.g.*

(1	**Determiner (Possessive Stem Noun**	**Inflection**	**Head Noun**	**Surface Form**	**Gloss**
	/ʃeʃ/	/er/	/din/	[#ʃe.ʃer#din#]	‘the last day’
	/din/	/er/	/ʃeʃ/	[#di.ner#ʃeʃ#]	‘end of the day
	/din/	/er/	/kaɹ/	[#di.ner#kaɹ#]	‘work for the da
	/kaɹ/	/er/	/din/	[#ka.ɹer#din#]	‘working day’
	/ʃeʃ/	/er/	/kaɹ/	[#ʃe.ʃer #kaɹ#]	‘work at the end
	/kaɹ/	/er/	/ʃeʃ/	[#ka.ɹer#ʃeʃ#]	‘end of the work

But rather than the relationship between the determiner possessive noun and the head noun, this study concentrates on the sound change through the process of affixation of first noun (henceforth stem) triggered by the genitive marker /er/. However, all the examples cited above being closed monosyllables, affixation and morpheme concatenation produces a /C#V/ sequence where the coda of the stem syllable blocks any vocalic adjacency. This sequence, with a morpheme boundary in between, neither offers any hiatus situation nor is favourable for any radical vocalic alternation at the phonological level.

With the monosyllabic stems, it’s observed that while undergoing genitivization the stem-final vowel behavior and the process of glide formation vary significantly depending upon syllable structure of the stem. If the monosyllabic stem is open but light, then the glide is formed to occupy the trailing syllable onset slot only. But when the stem is heavy with a diphthong, beside that glide-formation, the stem final diphthong is split into a full vowel and half vowel, the latter being merged with the gliding onset of the following syllable. As such, the syllable boundary is not very well-defined because of the bipositional representation of the output element, that is, the glide /j/ shared by two prosodic slots. Consequently, the head syllable has maintained its moraic heaviness even after the loss of the stem-final half-vowel at the surface level. Thus, the pattern of alternations taking place in the genitivization of all the monosyllabic stems is as follows

Pattern of Alternation ► / Stem Structure▼	Prosodic		Segmental			
	Syllabic Gain	Prominence Shifting	Glide Formation	Merger	V-Syncope	
					In Suffix	In Stem
Closed: /VC/ or /CVC/	✓	×	×	×	×	×
Open: /CV/ (monophthong-final)	✓	×	✓	×	×	×
Open: /CV̯/ (diphthong-final)	✓	×	✓	✓	×	×

Table 3: The Alternation Schema for Monosyllabic Stem Genitivization

Bangla stems disyllabic or monosyllabic prefer to receive the primary prominence word-initially.

That glide-formation or vowel syncope is slot-specific and prosodically motivated is evident in the following examples, where the same root forms the monosyllabic stem and the trailing syllable of a disyllable:

(2) **UR**	**Gloss**	**SR**		**Genitivized**	**Process**
/ʃɔ̀/	*'hundred'*	[ʃɔ̀]	→	[ʃɔ̀jer]	Glide epenthesis
/ɛ́kʃɔ/	*'one'*	[ɛ́kʃo]	→	[ɛ́kʃor]	Vowel Syncope (in suffix)
/cʰȧ/	*'offspring'*	[cʰá]	→	[cʰájer]	Glide epenthesis
/bȧcʰa/	*'baby'*	[bȧcʰa]	→	[bȧcʰar]	Vowel Syncope (in suffix)
/ɟʰi̇/	*'maid'*	[ɟʰi]	→	[ɟʰi̇jer]	Glide epenthesis
/bȯnɟʰi/	*'sister's daughter'*	[bȯnɟʰi]	→	[bȯnɟʰir]	Vowel Syncope (in suffix)
/pȯ/	*'son'*	[pȯ]	→	[pȯjer]	Glide epenthesis
/bʰȧi̯po/	*'nephew'*	[bʰȧi̯po]	→	[bʰȧi̯por]	Vowel Syncope (in suffix)

As the peak of the trailing syllable, the monophthong never leads to the glide formation since the suffix vowel syncope would maintain the lexical trochaic pattern. But, on the contrary, the same monophthong as the monosyllabic prominent peak attests glide formation in the following onset slot to convert the moraic trochee [$\sigma_{\mu\mu}$] into a lexical one [σ̇.σ].

Now let us come to the second strategy adopted in Bangla genitivization of singular non-specific nouns, *i.e.*, vowel syncope (*q.v.* Tables 1 and 2). Gimson (2001: 287) classified vowel deletion into 'allophonic variation' and 'phonemic elision'. He defined allophonic variation as the omission of the diphthong-final non-syllabic vowel. Glide-formation and merger, in genitivizing the diphthong-ended stems, as discussed above, is by no means this 'allophonic loss', since it is actually an adjacency-induced assimilation between two minimally

contrasted non-syllabic elements. In spite of merger, the preservation of moraic value of the diphthong-final element is an argument against any possibility of syncopation or deletion of any kind.

Cross-linguistically, in informal utterances, prosodically weak slots often lead to some phonological or acoustic reduction of the vowel as its nucleus. On the acoustic level, such vowel exhibits 'target undershoot' (Lindblom 1963, Stevens et al.1966) in general; whereas phonologically this reduction can even take the form of vowel syncope (*e.g.* Wells 1982, 1995, Dalby 1984, Lodge 1984, Nolan & Kerswill 1990, Ashby & Ashby 1990, Bald 1990, Fokes & Bond 1993, Laver 1994, Shockey 2000, Utman et al.2000). This is typical of all the stress-timed languages. But it is also evident in Bangla, a syllable-timed language though (Dan 1992, Ghosh 1996), especially in concatenative morphological processes like case-marking. The language has plenty of genitives where the non-prominent syllables have phonologically reduced vowels that are adjacent to the suffix-initial vowel. Adopting the moraic theory, this paper makes an attempt to investigate such reduction induced by morphological process of genitive inflection. Disyllabic Bangla genitives for the non-specific singular forms sometimes exemplify this phonologized syncopated reduction in certain contexts.

Like the glide, vowel syncope too features in a non-prominent syllable. Prominence ensures segmental distinctiveness but the lack of it leads to some loss of this distinctiveness. Following Clarey & Dixson (1963) and Rogerson (2006), it can be ascribed to the 'law of economy' with regard to the gestural kinematics of the articulators. This economy principle comes into effect when the articulators refuse to take a radically new position for every single sound and minimize the gestural contrast between the adjacent sounds in order to save time and energy. Beside the merger strategy, the same principle works in vowel syncope too that affects non-prominent syllable, but the reduction process mandatorily spares the leading syllables, the prominent heads, be it a monosyllabic stem or the head of a disyllable, (Table 4):

	Stem-Final Vowel			**Stem+Suffix**	**Gloss**	**Affixed Form**
i	[+ATR]	[+High]	[+Front]	/ʃi.ʃi/ + /r/	' bottle'	[ʃi.ʃir]
ii			[+Back]	/t^hu.tu/ + /r/	' saliva	[t^hu.tur]
iii		[-High] [-Low]	[+Front]	/c^he.le/ + /r/	'boy'	[c^he.ler]
iv			[+Back]	/mo.mo/ + /r/	' momo'	[mo.mor]
v	[-ATR]	[-High] [-Low]	[+Front]	—	—	—
vi			[+Back]	—	—	—
vii		[+Low]	[-Back]	/pa.ta/ + /r/	' leaf'	[pa.tar]

Table 4: Genitivization of Disyllabic Stems Open with Possible Monophthongs

In genitivizing a monophthong-final disyllabic stem, glide formation is not favoured because the stem-final syllable, being light,

can neither draw prominence nor can be heavy to form a moraic trochee. Then, in such open disyllables, beside glide, some segmental reduction in the form of vowel syncope takes place. With some complementary distribution, such vowel syncope affects either the stem-final or inflection-initial slot depending on morpho-phonemic and phonological factors.

Though vowel reduction takes the form of deletion in the non-prominent position, the process is hardly uniform. Disyllabic stems ending with the back-mid /e/ or /o/ occasionally (but not always) undergoes final vowel syncope after ginitivization (*q.v.* figure 3), whereas a stem ending with any other monophthong permitted in the slot retains its final vowel consistently and the suffix-initial vowel is then syncopated instead (*q.v.* figure 4).

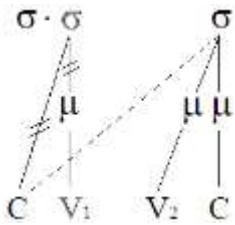


Figure 3: Vowel Syncope In the Stem-Final Slot of an Open Disyllable

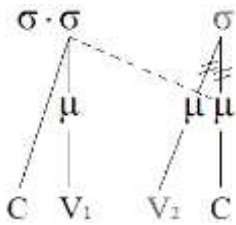


Figure 4: Vowel Syncope In the Suffix-Initial Slot of an Open Disyllable

As already mentioned, any quantal vowel occurring stem-finally in a disyllable is never reduced phonologically. That's why, when such disyllables undergo genitive case inflection, it's the suffix-initial vowel that is syncopated (Table 4, i, ii, and vii), as already shown in the following figure:

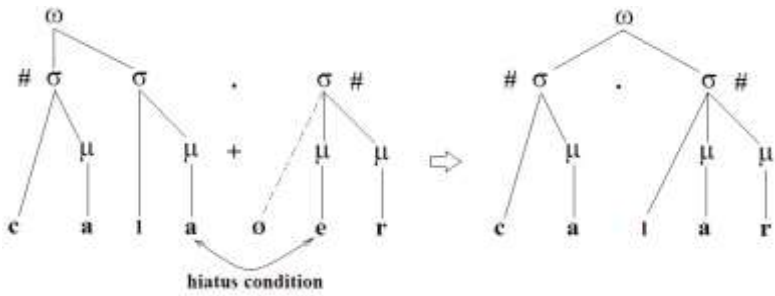


Figure 5: Vowel Syncope as a Strategy to Avoid a Possible Hiatus

Thus, the hiatus possibility in /V.e/ context (in the open disyllabic stem with /$C_0V_1C_nV_2$/ structure) has been averted through syncopating the suffix-vowel. But the preservation of V_2 is highly conditional rather than absolute. Quantal theory of vowels (Stevens 1972, 1989) argues in favour of a comparative articulatory-acoustic stability of the corner vowels. And, in accordance with this theory, Bangla /i/, /u/ and /a/ occurring stem-finally in a monosyllable or disyllable are absolutely resistant to any phonological change induced by genitive inflection. The disyllabic stems ending with corner vowels offer evidences for genitivization-driven vowel syncope, *e.g.* /ni.ʃi/ → /ni.ʃir/ *'of night'*, /t^hu.tu/→/t^hu.tur/ *'of saliva'* and /ca.la/→/ca.lar/ *'of hut'*, where the suffix-initial vowel has been syncopated.

Of the mid vowels, SCB never attests /ɛ/ and /ɔ/ word-finally (Table 4, v and vi), but licenses /e/ and /o/. However, the high-mid vowels are highly context-sensitive: any vocalic adjacency resulting from morpheme concatenation, often makes them syncopate themselves, or leads to suffix-initial vowel syncopation instead.

	UF	Gloss		SF
Syncope (Stem)	/pros.no/	'question'	+ /er/	[pros.ner]
	/c^{h}at.tro/	'sentence'	+ /er/	[c^{h}at.trer]
Syncope (Suffix)	/keʃ.ʈo/	'Lord Krishna'	+ /er/	[keʃ.ʈor]
	/kɛno/	'the reason'	+ /er/	[kɛnor]

Table 5: Genitivization of Open Disyllabic Stems: Slot-specific Vowel Deletion

But when the stem ends with the non-prominent peak /e/, *e.g.* /ɟele/ *'fisherman'* or /hire/ *'diamond'*, syncope of this /e/ or of the suffix-initial one leads to same surface form, *i.e.*, /ɟeler/ or /hirer/, respectively. To determine as to which vowel is syncopated here and in which specific context, some deep peep into similar cases with /o/-ended disyllabic is going to be really helpful. The factors (that configure the diverse contexts across languages) responsible for such vowel reduction include stress, vowel quality and consonantal context (Farnetani & Busà 1999), as well as prominence, prosodic rhythm and word length (Baltazani 2007). Now the rest of the paper intends to discuss several conditioning contexts in genitivization triggering vowel reduction that /e/ and /o/ undergo.

While surfacing word-finally in disyllabic stems, the output [o] is not always the same at the underlying input level. Rather, an [o] at the surface may be classified into two groups—

(I) non-derived; and

(ii) phonologically derived:—

(a) progressive vowel-harmony (VH)-induced

(as per the rule: ɔ → o/$V_{[+High][+Back]}$C___#)

(b) through word-boundary or non-prominence induced.

(as per the rule: ɔ → o/ σ.C___#)

Non-derived [o] is the one that is faithful to the UR (/o/ = [o]), and word-finally this faithful [o] never undergoes any phonological reduction. Rather, it leads to the vowel syncope in the genitive suffix-initial slot that immediately follows the non-derived [o], as in (3):

(3)		**UR**	**SR**	**Gloss**
Genitive				
/peto/	→ [peto]	'hand bomb'		[peɽor]
/gero/	→ [gero]	'tangle'		[geror]
/teto/	→ [teto]	'bitter taste'		[tetor]
/hero/	→ [hero]	'loser'		[heror]
/tɛro/	→ [tɛro]	'thirteen'		[tɛro]
/boro/	→ [boro]	'paddy type'		[boror]
/ʃolo/	→ [ʃolo]	'sixteen'		[ʃolor]
/k^hok^{h}o/	→ [k^hok^{h}o]	'a game'		[k^hok^{h}or]
/alo/	→ [alo]	'light'		[alor]
/kalo/	→ [kalo]	'colour black'		[b^halor]
/b^halo/	→ [b^halo]	'goodness'		[b^halor]

Such resistance of the underlying [o] is inherent and absolute. Contrarily, when derived phonologically (/ɔ/ → /o/), it betrays ambiguous behavior: the vowel-harmony (VH)-induced one never syncopates (as in (4)), but as the prosodic weakness/word-finality induced one it frequently does so (*cf.* (6), (8), (10)-(11)).

/d^hula/	→	[d^hulo]	'dust'	[d^hulor]
/ɟuta/	→	[ɟuto]	'shoe'	[ɟutor]
/tula/	→	[tulo]	'cotton'	[tulor]
/d^huna/	→	[d^huno]	'incense'	[d^hunor]
/mukta/	→	[mukto]	'pearl'	[muktor]
/sukta/	→	[sukto]	'bitter dish'	[suktor]
/nou̯ka/	→	[nou̯ko]	'boat'	[nou̯kor]

It supports the claim of Farnetani & Busà 1(999) that vowel quality often plays a decisive role in vowel reduction and syncopation. In (4) the VH-triggering [+High] vowel /u/ can be held responsible in a way for the suffix-vowel syncope because the /u/ has transferred its [+ATR] value to the following vowel. Thus, the /u/ and /o/ become even less contrastive and form together too strong a collocative bond to allow any alternation process. The impact of the [+High] vowel on /o/ makes the latter exclusively immune to any other alternation rule; thus it can be said that the progressive VH rule (say, rule X) and the stem-final deletion rule (say, rule Y) are in a 'bleeding' relationship (Kiparsky 1968):

Bleeding Rule: X bleeds Y if application of X eliminates potential inputs to Y.

Here, as soon as the VH effect is exercised on /o/, it makes it impossible for the stem-final deletion rule to work on this high-mid back vowel.

When /e/-final disyllable is genitivized, the locality of vowel syncope is ambiguous, *e.g.* /pe̯.pe/ *'papaya'* + /er/ → /pe̯.per/. As the alternation is like /e.e/ → [e], it's not a straightforward case to conclude which /e/ gets syncopated: the stem-final or the suffix-initial one. However, the discussion above on the stem-final /o/ preservation can solve the puzzle about /e/ deletion in the following examples:

(5)	**UR**	**Gloss**	**SR**		**Genitivized SR**
a.	/bije/	'marriage'	[bije]	→	[bijer]
	/c^{h}ele/	'boy'/ 'son'	[c^{h}ele]	→	[c^{h}eler]
	/meje/	'girl'/ 'daughter'	[meje]	→	[mejer]
	/ɟele/	'fisherman'	[ɟele]	→	[ɟeler]
	/bede/	'gypsy type'	[bede]]	→	[beder]
	/kaste/	'scythe'	[kaste]	→	[kaster]
b	/b^{h}ik^{h}k^{h}a/	'begging'	[b^{h}ikk^{h}e]	→	[b^{h}ikk^{h}er]
	/ninda/	'denouncement'	[ninde]	→	[ninder]
	/mit^{h}t^{h}a/	'lie'	[mitt^{h}e]	→	[mitt^{h}er]
	/piʈ^{h}a/	'home-made cake'	[piʈ^{h}e]	→	[piʈ^{h}er]
	/p^{h}ita/	'tape'	[p^{h}ite]	→	[p^{h}iter]

The same reasoning about UF—SF correspondence (as in (5)a.) and vowel harmony effect (as in (5)b.) can justify the preservation of stem-final /e/ and syncope of the affix-initial /e/ while undergoing genitivization (Figure 6):

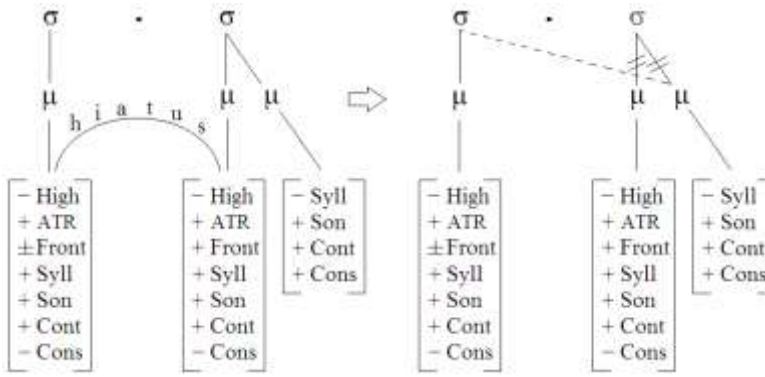


Figure 6: Stem-final Vowel Preservation Featurally Captured

Thus, it's evident that, with the loss of suffix-initial /e/, the syllabicity is lost, and the moraic coda /r/ has to be associated with the previous syllable.

But the occurrence and alternation of the stem-final /o/ is more frequent and complicated. Like /e/, as already shown how the stem-final high-mid vowel /o/ refuses to undergo syncope when:

(i) it originates from the progressive VH;

(ii) it is faithful to the underlying form: that means, there is a correspondence between the input and the output.

Besides, the following discussion is going to add more conditions for /o/ preservation like: when

(iii) it forms the trailing peak with non-glottal intervocalic singleton as the onset;

(iv) it forms high-mid vowel combination /e+o/ with no glottal singleton in between in the disyllabic lexical domain; and

(v) it occurs stem-finally in the lexically transferred category of noun.

At the first place, when the stem-final vowel is resistant to syncopation, inversely it triggers the same suffix-initially in order to maintain the disyllabic structure and to keep the preferred lexical trochee intact. The Figure below shows how the suffix vowel /e/ deletion (that mora loss means loss of syllabicity itself) leads to restructuring of the second syllable.

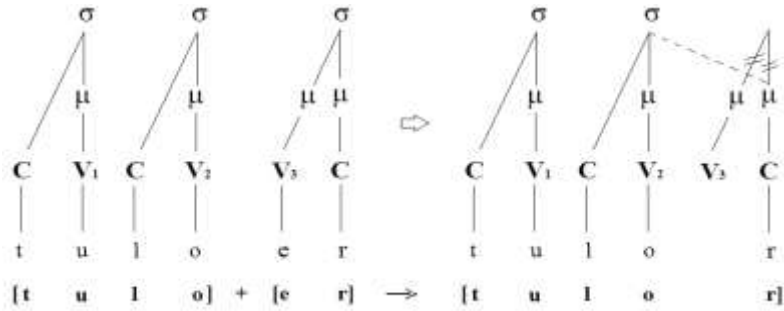


Figure 7: Suffix-initial Vowel Syncope and Preservation of the Lexical Trochee

Though the moraic weight of the coda /r/ is retained, and consequent upon its transfer to the stem-final syllable, the trailing syllable becomes heavy (as shown in Figure 7 above), the lexical trochee structure remains intact because of the stem-final non-prominence requirement.

On the other hand, when syncopation spares the suffix-initial vowel, it comes into force stem-finally. But to remember, of all vowels in the stem-final slot, the most context sensitive is /o/. In disyllables, this vowel, surfacing in the stem-final slot as an outcome of the non-prominence-induced raising of the default vowel /ɔ/ (necessarily followed by a word-boundary), can syncopate only. But such syncope of this stem-final /o/ (even when /o/ is induced by # or by prosodic weakness) is neither absolute nor uni-local. Though in most cases it is syncopated (as in (6), (8), (9) and (11)), sometimes it's retained and the suffix can be affected, as evident in (7), (10) and (12).

(6) **UR**		**SR**	**Gloss**	**Genitive**
/grihɔ/	→	[griho]	'house'	[griher]
/dehɔ/	→	[deho]	'body'	[deher]
/snehɔ/	→	[sneho]	'affection'	[sneher]
/buhɔ/	→	[buho]	'circle'	[buher]
/mohɔ/	→	[moho]	'fascination'	[moher]
/grəhɔ/	→	[groho]	'planet'	[groher]

Farnetani & Busà (1999) talked about the effect of vowel quality and consonantal context on the vowel reduction, and the examples in (6)-(11) bear evidences for this. The intervocalic /h/ is a glottal singleton that requirs the least lingual or labial participation. Due to the absence of any strict locality in the oral constriction, the glottal /h/ can neither be a moraic coda nor be geminated, and the voice onset time (VOT) for the following vocalic element is hardly distinguishable from the voice offset of the previous vowel. As such, the post-glottal vowel tends to be reduced more acoustically, and in this kind of genitivization the reduction becomes phonological. Thus, the intervocalic singleton /h/ leads consistently to the stem-final syncope, whereas such syncope is effectively blocked by any non-glottal singleton between vowels:

(7) **UR**		**SR**	**Gloss**	**Genitive**	**Genitive**
/ʃɔtɔ/	→	[ʃɔto]	'hundred'	*[ʃɔter]	[ʃɔtor]
/k^hɔtɔ/	→	[k^hɔto]	'wound'	*[k^hɔter]	[k^hɔtor]
/nɔmɔ/	→	[nɔmo]	'regards'	*[nɔmer]	[nɔmor]
/brɔnɔ/	→	[brɔno]	'acne'	*[brɔner]	[brɔnor]
/brɔtɔ/	→	[brɔto]	'vow	*[brɔner]	[brɔnor]

Importantly beside the stem-final vowel preservation, in these genitive surface forms the [ATR] disharmony characterizes the vowel combinations. With a glottal singleton in between, the vowels strictly form a vowel combination on the principle of [ATR] harmony but no such harmony in case of other intervocalic consonants. It argues in favour of two points: (i) consonantal effect on vowel reduction—intervocalic singleton /h/ ensures stem vowel syncope and the resultant VH but the non-glottal blocks it, and (ii) vowel quality effect—when the stem-final vowel (here post-glottal) is weak in terms of both prosody and acoustics, hiatus condition is averted by its syncopation. On the contrary, when the stem-final syllable is weaker only prosodically but not otherwise significantly (post-non-glottal singleton) then the second vowel is retained and suffix vowel syncopates (*q.v.* (7)).

The following figure shows how, with the syncope of the stem-final vowel, the syllabicity itself is lost and consequently the onset shifts to the very next syllable.

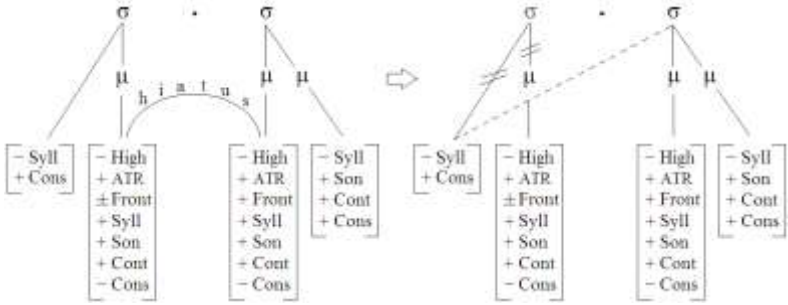


Figure 8: Stem-final Vowel Syncope Featurally Captured

Most importantly in this process the hiatus has been blocked. While the alternation process has been featural presentation above, it can also be analysed using the precepts of linear phonology showing a contrast between the underlying form and the surface form:

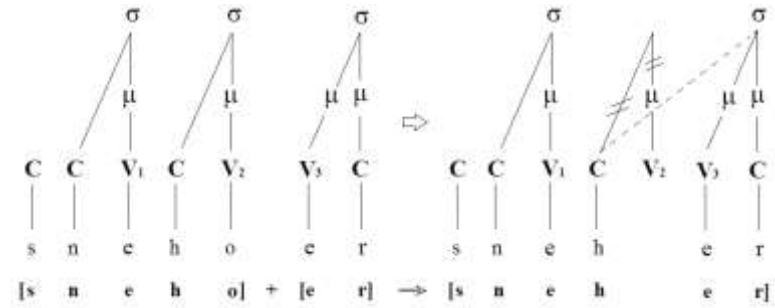


Figure 9: Stem-final Vowel Syncope and Preservation of the Lexical Trochee

It shows how, at the output level, the underlying V_2 has lost its association with any surface form.

[In Bangla, the word-initial /s/ followed by another consonant in the onset is extra-syllabic (Fudge 1969, Kenstowicz 1994)].

In spite of the trochaic rhythm lexically maintained throughout, in pre-genitive disyllables in (6) and (7), both the syllables are light. This cross-syllabic moraic parity makes it conducive for the intervocalic singleton consonant quality (glottal versus non-glottal) to play a decisive role in determining the syncope locality. Having had both prominence and moraic heaviness, two-fold weightage on the leading syllable compels the following syllable peak to syncopate (*e.g.* (8) - (10), sparing only the cross syllabic vowel combination /e+o/ in the stem (*e.g.* (11)).

(8)	**Stem**		**SR**	**Gloss**	**Affixed Form**
a.	/soi̯nɔ/	→	[soi̯no]	‘soldier’	[soi̯ner]
	/doi̯bɔ/	→	[doi̯bo]	‘miracle’	[doi̯ber]
	/doi̯nɔ/	→	[doi̯no]	‘penury’	[doi̯ner]
	/sou̯dʰɔ/	→	[sou̯dʰo]	‘monument’	[sou̯dʰer]
	/mou̯lɔ/	→	[mou̯lo]	‘element’	[mou̯ler]
b.	/lou̯hɔ/	→	[lou̯ho]	‘iron’	[lou̯her]

Thus, the effect of the intervocalic non-glottal singleton, as mentioned in (7), has been lost as soon as the moraic weight parity in the stem dissolves into comparative heaviness of the leading syllable that is now

bimoraic (*q.v.* (8)a). The example in (8)b. supports the claims about stem-final deletion triggered by both intervocalic glottal singleton /h/ and heavy leading syllable.

While the above set provides examples of bimoraic leading syllable in the stem that is heavy with the diphthong (a moraic trochee in itself, *cf.* Figure 2b.), such heaviness can also be ascertained by the monophthongal peak plus a coda to make it a moraic trochee too (*cf.* Figure 2c.). (9) contains examples with intervocalic geminate, and the next set in (10) offers examples of consonant cluster belonging to two different prosodic slots.

(9)	**UR**		**SR**	**Gloss**	**Genitive**
	/biʃʃɔ/	→	[biʃʃo]	'world'	[biʃʃer]
	/ɟudʰdʰɔ/	→	[ɟuddʰo]	'battle'	[ɟuddʰer]
	/sottɔ/	→	[sotto]	'truth'	[sotter]
	/soɟʰɟʰɔ/	→	[soɟɟʰo]	'toleration'	[soɟɟʰer]
	/kɔmmɔ/	→	[kɔmmo]	'work'	[kɔmmer]
	/pɔddɔ/	→	[pɔddo]	'lotus'	[pɔdder]
	/bakkɔ/	→	[bakko]	'sentence'	[bakker]
	/kʰaddɔ/	→	[kʰaddo]	'food'	[kʰadder]

These entries further strengthen the argument for moraic heaviness of the stem-head being instrumental for the syncopation of its final vowel. A non-singleton in intervocalic position—made of the coda (the non-syllabic glide of the diphthong or the moraic consonant) and the following onset—leads to the same effect without fail. This non-singleton effect is evident when it is a glide-consonant combination (in (8)), or a long consonant/geminate belonging to two different prosodic slots (in (9)) or a cluster of two different consonants (in (10)):

(10)	**UR**		**SR**	**Gloss**	**Genitive**
	/tirtʰɔ/	→	[tirtʰo]	'pilgrimage'	[tirtʰer]
	/mitrɔ/	→	[mitro]	'friend'	[mitrer]
	/kʰetrɔ/	→	[kʰetro]	'field'	[kʰetrer]
	/bɛgʰrɔ/	→	[bɛgʰro]	'tiger'	[bɛgʰrer]
	/sutrɔ/	→	[sutro]	'clue'	[sutrer]
	/gotrɔ/	→	[gotro]	'sub-race'	[gotrer]
	/pɔtrɔ/	→	[pɔtro]	'letter'	[pɔtrer]
	/ʃɔŋkʰɔ/	→	[ʃɔŋkʰo]	'conch'	[ʃɔŋkʰer]
	/gɔlpɔ/	→	[gɔlpo]	'story'	[gɔlper]
	/kanɖɔ/	→	[kanɖo]	'stem'	[kanɖer]
	/patrɔ/	→	[patro]	'groom'	[patrer]

With a geminate as the intervening consonant, post-genitivization vowel combination /e/+/e/ is unattested in Bangla. Then there will be suffix vowel syncope and the stem-final /o/ is to be retained. This is evident in (11) but the finding here goes against the claim made in (9).

(17/11)	**UR**	**SR**	**Gloss**	**Ungrammatical**	**Genitive**
/sedʰdʰɔ/	→	[seddʰo]	'boiling'	*[seddʰer]	[seddʰor]
/lekʰkʰɔ/	→	[lekkʰo]	'document'	*[lekkʰer]	[lekkʰor]
/sebbɔ/	→	[sebbo]	'liquid'	*[sebber]	[sebbor]
/mlecʰcʰɔ/	→	[mlecʰo]	'untouchable	*[mlecʰer]	[mlecʰor]

All the three instances violate the rule of twofold weightage on leading syllable triggering stem-final deletion, because Bangla sharply prefers cross-syllabic /e+o/ combination to /e+e/ when the geminate (bilabial /bb/, alveolar /d^hd^h/, affricate /c^hc^h/ or velar /k^hk^h/) intervenes. This provides evidence for the impact of the prominent vowel plus geminate (/e+C:/) on vowel syncope in Bangla singular genitives.

Additionally, nouns with /σ.Cɔ/→[σ.Co] structure derived through syntactic category transfer makes its final vowel alternation-proof, and leads to the loss of suffix vowel /e/, as seen in (12) following:

(12) **Syntactic**	**R**		**SR**	**Gloss**	**Genitive Category**
adjective	/meɻɔ/	→	[meɻo]	'middle'	[meɻor]
adjective	/bɔɽɔ/	→	[bɔɽo]	'elder'	[bɔɽor]
adjective	/c^hoɽɔ/	→	[c^hoɽo]	'young'	[c^hoɽor]
adjective	/ɟɔɽɔ/	→	[ɟɔɽo]	'inanimate'.	[ɟɔɽor]
adverb	/kɛnɔ/	→	[kɛno]	'why'	[kɛnor]
adverb	/kɔtɔ/	→	[kɔto]	'which number'	[kɔtor]

All the examples in (17) may also be taken as evidences for this syntactic category transfer effect.

When in Bangla /o/-final nouns are adopted as person names (generally with more than one intervening consonant), the distinction is maintained in their genitive forms—in personal genitives there is suffix-initial syncope, but in the genitivized common nouns it is the stem-fianl /e/ that is syncopated, *e.g.* (13):

(13) **UR**		**SR**	**Gloss**	**Genitive (non-human)**	**Genitive (person name)**	
/biʃʃɔ/	→	[biʃʃo]	'world	[biʃʃer]	'a proper name'	[biʃʃor]
/tirt^hɔ/	→	[tirt^ho]	'pilgrimage'	[tirt^her]	'a proper name'	[tirt^hor]
/sottɔ/	→	[sotto]	'truth'	[sotter]	'a proper name'	[sottor]
/ʃɔŋk^hɔ/	→	[ʃɔŋk^ho	'conch'	[ʃɔŋk^her]	'a proper name'	[ʃɔŋk^hor]
/pɔddɔ/	→	[pɔddo]	'lotus'	[pɔdder]	'a proper name'	[pɔddor]

Finally, it comes to the point that, in Bangla /CVC_nV/ non-specific disyllables all the attested stem-final vowels, except /o/ in certain contexts, necessarily undergo suffix-initial vowel syncope for their singular genitives. The preservation of stem-final /o/ can result from only—

(i) UF-SF correspondence effect (*q.v.* (3), (5)a.);
(ii) VH effect (*q.v.* (4), (5)b.);
(iii) Intervocalic non-glottal singleton effect (*q.v.* (7));
(iv) Pre-intervening geminate /e/ effect (*q.v.* (11));
(v) Syntactic category transfer effect (*q.v.* (12)); and
(vi) Person name effect (*q.v.* (13)).

Thus, the whole pattern of genitivization of the disyllabic nouns is as the following:

Pattern of Alternation ►	Prosodic		Segmental			
					V-Syncope	
Stem Structure▼	Syllabic Gain	Prominence Shifting	Glide Formation	Merger	In Suffix	In Stem
Closed: /VC_nVC/ or /CVC_nVC/	✓	×	×	×	×	×
Open:/VC_nV/ or /CVC_nV/ (monophthong-final)	×	×	×	×	✓ / ×	× / ✓
Open: /CVCV̰/ (diphthong-final)	✓	✓	✓	✓	×	×

Table 6: The Alternation Schema for Disyllabic Stem Genitivization

Thus, in genitivization of non-specific singular nouns, a monosyllabic stem necessarily allows a glide and a monophthong-final disyllable leads to vowel syncope (the slot being variable) for the sake of fulfillment of prosodic constraints. The paper has offered some insights into how and why this reduction process exclusively spares all other monophthongs in the stem-final position except /o/. Of course, while undergoing genitive affixation, the inflectional vowel /e/ may also get deleted to avoid glide formation, as an alternative strategy to this /o/ → /Ø/ deletion from the stem-final slot. But standard colloquial Bangla (SCB) has a sharp inclination toward the first (stem-final deletion) rather than to the other (*i.e.* suffix-initial deletion).

References

Ashby, M.G. & P. Ashby (1990). *Generalization on RP Consonant Clusters*. In Ramsaran, S. (ed.). pp. 168-177.

Bald, W.D. (1990). *An Example of Phonological Reduction in English*. In Ramsaran, S. (ed.). pp. 317-322.

Baltazani, Mary (2007). *Prosodic Rhythm and the Status of Vowel Reduction in Greek*. Selected papers on theoretical and applied linguistics from the 17th international symposium on theoretical & applied linguistics, vol. 1.31-43. Department of Theoretical and Applied Linguistics, Thessaloniki.

Blake, B. J. (1994). *Case*. Cambridge: Cambridge University Press.

Clarey M.E. & R.J. Dixson (1963). *Pronunciation Exercises in English*. New York: Regents.

Dalby, J.M. (1984). *Phonetic Structure of Fast Speech in American English*. Unpublished Ph.D. Dissertation, Indiana University.

Dan, M. (1992). *Some Issues in Metrical Phonology of Bangla: The Indigenous Research Tradition*. Unpublished Ph.D. Dissertation, Deccan College, Pune, India.

Faenhdrich, Burgel R. (2005). The Effect of Mora-Timing on the Duration of Vowels Preceding Geminate Consonants. *University of Hawai'i Working Papers in Linguistic.*, Vol. 36, No. 3. (April 2005), pp. 1-20.

Farnetani, Edda & M. Grazia Busà (1999). *Quantifying The Range of Vowel Reduction In Italian*. ICPhS99. San Fansisco, USA.

Fokes, J. & Z.S. Bond (1993). The Elusive/Illusive Syllable. *Phonetica 50*. pp. 102-123.

Fudge, E. (1969). Syllables. *Journal of Linguistics 5*, pp. 253-286.

Ghosh, Tanmay (1996). *Some Aspects of the Vowel Phonology of Bangla and Bangla English*. Unpublished M.Phil. Dissertation, CIEFL-Hyderabad, India.

Gimson, A.C. (2001). *Gimson's Pronunciation of English* (6th Edition). London: Arnold.

Hayes, Bruce (1987). A Revised Parametric Metrical Theory. *Northeastern Linguistics Society*, 17, pp. 274–289.

Hayes, Bruce (1995). *Metrical Stress Theory. Principles and Case Studies* . University of Chicago Press.

Hung, Henrietta J. (1993). *Iambicity, Rhythm, and Non-Parsing*. Presented at Rutgers Optimality Workshop (ROW-1) on Theoretical Issues in Ergative Languages, October 22. New Brunswick NJ, USA.

Kenstowicz, M. (1994). *Phonology in Generative Grammar*. Cambridge: Blackwell.

Kiparsky, P. (1968). *Linguistic Universals and Linguistic Change*. In Bach, E. and Harms, R. T., (ed.). *Universal in Linguistic Theory*. Holt, Reinhart, and Winston, New York, pp.170–202.

Laver, J. (1994). *Principles of Phonetics*. Cambridge: Cambridge University Press.

Lichtenberk, Frantisek (2009). Attributive possessive constructions in Oceanic. In McGregor, William B. (eds.) *The Expression of Possession* (pp. 249-292). Mouton de Gruyter. Berlin, Germany.

Lindblom B. (1963). Spectrographic Study of Vowel Reduction, *Journal of Acoustical Society of America* 35, 1773–1781.

Lodge, K.R. (1984). *Studies in the phonology of Colloquial English*. London and Sydney: Croon Helm.

Nolan, F & P.E. Kerswill (1990). *The Description of Connected Speech Processes*. In Ramsaran, S. (ed.). pp. 295-316.

Rogerson, Moana (2006). 'Don'cha Know? *A Survey of ESL Teachers'. Perspectives on Reduced Forms Instruction, Perspectives on Teaching Connected Speech to Second Language Speakers*, ed. by Brown, J. D. and K. Kondo-Brown, 85-97, University of Hawaii Press, Honolulu.

Shockey, L. (2000). *Some Casula English Sound Patterns. Manuscript*. University of Reading.

Stevens, K.N., House, A.S. & Paul, A.P. (1966). Acoustical Description of Syllabic Nuclei: An Interpretation in Terms of a Dynamic Model of Articulation, *Journal of the Acoustical Society of America* 40, 123-132.

Utman, J.A., Sh. Blumstein & M. Burton (2000). Effects on Sub-phonetic and Syllabic Structure Variation on Word Recognition. *Perception and Psychophysics* 62, 6. Pp. 1297-1311.

Wells, J.C. (1982). *Accents of English.* Cambridge: Cambridge University Press.

Wells, J.C. (1995). *New Syllabic Consonants in English*. In Windsor-Lewis, J. (ed.). pp. 401-412.