Extended geminates, and the preference for CVC syllables in Bangla/Bengali

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Bangla is known to be a language that is rich in both phonemic and derived geminates (Kar, 2010; Khan, 2010). Most geminates in Bangla fall into three categories found crosslinguistically: lexical geminates, e.g., /konna/ → [ˈkon.na] 'daughter'; assimilated geminates, e.g., /raʈ + ɖin/ → [ˈraɖ.ɖin] 'day-night, and concatenated geminates, e.g., /ʃaʈ + ʈara/ → [ˈʃaʈ.ʈara] 'seven star' (c.f. Kar, 2009; Ridouane, 2010; Davis, 2011; Oh & Redford, 2012; Hayes, 1989). In this paper we extend previous research on Bangla, by describing and providing an explanation for the properties of a fourth, previously unexplored, category of geminates, which we name "extended geminates" as the examples in (1):

1. (i) [kː] in /bi + krom/ → [ˈbik.krom] 'chivalry' (ii) [gː] in /bi + gjan/ → [ˈbig.gɛn] 'science'
   (iii) [k^{h}ː] in /ku + kʂɔn/ → [ˈ$kuk^{h}.k^{h}$ɔn] 'bad time'

Like assimilated and concatenated geminates, Bangla extended geminates occur in derived environments. However, unlike other geminates, the surfacing of extended geminates alters syllable structure from /CV+CCVC/ to [CVC.C(C)VC]. The process of extended gemination thus transforms CV syllables into CVC syllables, exhibiting a cross-linguistically unusual preference for the creation of a CVC over a CV syllable, even though CV is cross-linguistically the least-marked syllable type (Levelt, Schiller, & Levelt 2000), and even though, in Bangla, CV is the most common syllable type (Kar, 2010). Our paper thus addresses two questions: (1) what is the phonological motivation for the derivation of extended geminates; and (2) what is the motivation for the preference of CVC over CV syllable types in Bangla extended geminates?

In our paper, we systematically examine a comprehensive set of data collected from the *Adhunik Bangla Avidhan* (Modern Bangla Dictionary, 2016) and the existing literature, predominantly from Kar (2010). We show that the extended geminates in Bangla are derived at prefix-stem boundaries when the initial singleton consonant in an underlyingly complex-onset stem, immediately follows a vowel final prefix syllable. Extended gemination is triggered by only three underlying complex onset types: obstruent – semi-vowel (ii), obstruent – retroflex fricative (iii), and obstruent – liquid (i) where there is a sonority gap between the consonants (c.f. Kar, 2010; Gouskova, 2004).

We argue that the phonological motivation behind the derivation of extended geminates through the creation of a coda in Bangla comes from the need for structures imposed by an interaction between the *Lexical Stress* pattern and the *Syllable Contact Law*. Using the framework of Optimality Theory (OT) (c.f. McCarthy, 2001; Prince & Smolensky, 2002; and Kager, 2004) we propose a higher ranking of the constraints, STRESSED SYLLABLE LAW (SSL): stressed syllables are bimoraic (Hall, 2003) which ensures that a stressed syllable must have a coda, and SYLCONTACT: sonority must not rise across a syllable boundary (Gouskova, 2002) which prevents the creation of a syllable boundary in between obstruent and semi-vowel (ii), obstruent and retroflex fricative (iii), or obstruent and liquid (i) (Tableau 1). Our analysis also accounts for the fact that the second consonant in (ii) and (iii) never surfaces because Bangla does not allow obstruent – semi-vowel and obstruent – retroflex fricative complex onsets (Kar, 2010).

Tableau 1: Extended gemination in Bangla

/bi + krom/	SSL	SYLCONTACT	NOGEMINATION	NOCODA
a. [ˈbi.krom]	*!			
b. [ˈbik.rom]		*!		*
☞c. [ˈbik.krom]			*	*

References

Adhunik Bangla Avidhan (Modern Bangla Dictionary) (2016). Ed. Choudhury, Jamil. Bangla Academy, Dhaka.

Davis, Stuart. (2011). Geminates. In Marc van Oostendorp, Colin J. Ewen, E. H. and Rice, K., editors, *The Blackwell Companion to Phonology*, *2*, 837–859. Wiley-Blackwell, Malden, MA and Oxford.

Gouskova, Maria. (2004). Relational hierarchies in Optimality Theory: the case of syllable contact. *Phonology*, *21*(2), 201–250. https://doi.org/10.1017/s095267570400020x

Gouskova, Maria. (2002). Falling sonority onsets, loanwords, and Syllable Contact. In M. Andronis, C. Ball, H. Elston & S. Neuvel (Eds.*), CLS 37: the main session. Papers from the 37th meeting of the Chicago Linguistic Society* (pp. 175-186). Chicago: The Chicago Linguistics Society.

Hall, Tracy Alan. (2003). On the nongemination of /r/ in West Germanic twenty years later. Conference presentation. *Old World Conference in Phonology I*, Leiden.

Hayes, Bruce. (1989). Compensatory lengthening in moraic phonology. *Linguistic Inquiry, 20*. 253–306

Kager, Rene. (2004). *Optimality Theory.* Cambridge: Cambridge University Press.

Kar, Somdev. (2009). Gemination in Bangla: An Optimality Theoretic Analysis. *The Dhaka University Journal of Linguistics, 1*(2), 87-114.

Kar, Somdev. (2010). *Syllable Structure of Bangla: An Optimality-Theoretic Approach.* Newcastle upon Tyne: Cambridge Scholars Publishing.

Khan, Sameer ud Dowla (2010). Bengali (Bangladeshi Standard). *Journal of the International Phonetic Association*, *40*, 221-225.

Levelt, Clara. C., Schiller, Niels. O., & Levelt, Willem. J. (2000). The Acquisition of Syllable Types. *Language Acquisition*, *8*(3), 237–264. https://doi.org/10.1207/s15327817la0803_2

McCarthy, John. (2001). *A Thematic guide to optimality theory*. Cambridge: Cambridge University Press.

Oh, GE., & Redford, MA. (2012). The production and phonetic representation of fake geminates in English. *Journal of Phonetics 40*(1), 82-91.

Prince, Alan S., & Paul Smolensky (2002). *Optimality Theory: constraint interaction in generative grammar*, Ms. first circulated (1993) University of Massachusetts, Amherst, MA and Rutgers University, New Brunswick, NJ, RuCCS-TR-2. [ROA-537, http://ruccs. rutgers. edu/roa.html].

Ridouane, Rachid. (2010). Geminates at the junction of phonetics and phonology. *Laboratory Phonology 10*, 61-90.