An Optimality Theoretic (OT) account of word-final vowel epenthesis and deletion processes in the incorporation of loanwords into the Dhaka dialect of Bangla

Khaled Karim
University of Victoria
khaledk@uvic.ca

This paper investigates the phenomenon of word-final vowel epenthesis and consonant deletion processes in the incorporation of loanwords into the Dhaka dialect of Bangla and provides an Optimality Theoretic (OT) account of these two processes. With tableaux, I have demonstrated that a high-ranked markedness constraint *COMPLEX^{COD} (Kager, 1999), is active in Dhaka. Also, while MAX-C/V motivates the optimal outputs with a deleted consonant in 'nasal+obstruent' 'liquid [l]+obstruent' and 'stop+stop' clusters, the vowel epenthesis in 'liquid+nasal' clusters is allowed by two lower ranked faithfulness constraints CONTIG-IO and DEP-IO. Finally, I interpreted that the apparent /r/ deletion in 'liquid [r]+obstruent' clusters of OB in Dhaka dialect is a process of merger of /r/ with the preceding vowel (Cote, 2004) or it is an effect of auditory perception of English source language form (i.e., perceiving /r/ as a vowel) by borrowing language speakers of Dhaka dialect.

1 Introduction

This paper investigates the phenomenon of word-final vowel epenthesis and consonant deletion processes in the incorporation of loanwords into the Dhaka dialect of Bangla and provides an Optimality Theoretic (OT) account of these two processes. The vowel epenthesis process in Dhaka dialect takes place to break the consonant clusters word-initially, word-medially and word-finally. The deletion process in consonant cluster simplification is evident only in word-final positions. This paper accounts for the vowel epenthesis and consonant deletion processes evident in the word-final clusters in the Dhaka dialect. Examples presented in (1a &1b) demonstrate the epenthesis and deletion patterns evident in word-final clusters.

(1) Source (English borrowing) Loan adaptation Gloss

a. hɔrn 'horn'	(CVCC)	→	hɔrɔn (CV.CVC)
b. panʈ 'pant'	(CVCC)	→	pan (CVC)

Previous research has investigated epenthesis in word initial clusters in non-standard Bangla (e.g., Gouskova, 2001) and also investigated the syllable structure of standard Bangla with a limited comparison with its dialectal variation (e.g., Kar, 2009), but no research has directly investigated the epenthesis and deletion processes in all three clusters of any of the dialectal variations of Bangla. Accordingly, this study aims to address one of these phenomena evident in Dhaka dialect with a detailed description and analysis, which will be a valuable contribution to research literature. The main source of the data is the researcher himself, but Bangla dictionary and previous research (e.g., Kar, 2009[1]) were also used to obtain certain data. The analysis of the data is within the framework of Optimality Theory (OT) (McCarthy & Prince 1993; Prince & Smolensky, 1993) to reveal the motivations behind the split epenthesis patterns and the deletion processes.

The paper is organized as follows: Section 2 provides background information about Bangla. Next, section 3 presents the possible word-final clusters and an overview of the epenthesis and deletion facts observed in Dhaka dialect. An OT analysis of epenthesis and deletion, along with motivation for the constraints posited therein is included in section 4. Finally, Section 5 wraps up with the conclusion.

2 About Bangla and the Dhaka dialect

Bangla, known as Bengali in English, is an eastern Indo-Aryan language with approximately 211 million speakers in Bangladesh and the Indian state of West Bengal. Bengali emerged as a new Indo-Aryan language by 900-1000 AD from Magadhi Prakrit (600 BC - 600 AD), a descendent vernacular form of the ancient Sanskrit language, along with two other Indo-Aryan languages, Oriya and Assamese (Chatterji, 1926). The Bangla alphabet is a syllabic alphabet in which consonants all have an inherent vowel. Vowels can be written as independent letters, or by using a variety of diacritical marks which are written above, below,

[1] I am indebted to Somdev Kar, who shared his thesis and the Bengali corpus with me. He did an immense amount of work on the syllabification of standard Bangla that has made my research possible. My description and analysis of vowel epenthesis and deletion processes of Dhaka dialect are built on the data of Standard Bangla he used in his thesis.

© 2011 Khaled Karim

before or after the consonant they belong to. Word order in Bangla is SOV (Kar, 2009), for example, ami (I) bhat (rice) khai (eat) instead of "I eat rice" in English.

Bangla lexicon is varied, as a range of words have been integrated into it from different languages. In terms of the origin of words, Bangla lexicon can be stratified in three major groups: a) Tadbhaba b) Tatsama and c) Deshi o Bideshi (Kar, 2009). Tadbhaba words are Native Bangla (henceforth, NB) words, rooted in Sanskrit and Prakrit. These words had been borrowed from Sanskrit, but had changed to fit the phonology of Bangla language. E.g., /kāṭh/ [kaʈʰ] 'wood', /phul/ [pʰul] 'flower' etc. (Kar, 2009). Tatsama words are directly borrowed from Sanskrit (henceforth SB: Sanskrit borrowing) and they retained their original Sanskrit form. E.g., /grām/ [gram] 'village', /kabi/ [kobi] 'poet' etc. (Kar, 2009). Deshi o Bideshi are words borrowed from Indian (Deshi) and foreign languages (Bideshi), which could not be traced back to Sanskrit. Henceforth, this will be abbreviated as OB (Other Borrowing). E.g., /ānāras/ [anarɔʃ] 'ananas' (<Portuguese), /burjoyā/ [burɟoa̯] 'bourgeois' (<French), /bāduṛ/ [baduɽ] 'bat' (<Austro- Asiatic), /haratāl/ [hɔrotal] 'strike' (<Gujarati: [hɔʈtal]) etc. (Kar, 2009).

Bangla has two literary styles: one is called Sadhubhasa (elegant language) and the other Chaltibhasa (current language). The differences between the two styles are not huge and involve mainly forms of pronouns and verb conjugations (Sahidullah, 1965). Spoken Bangla, including what is heard in news reports, speeches, announcements, is modeled on Choltibhasha. This form of spoken Bangla stands alongside other spoken dialects or regional Bangla. The majority of Bengalis are able to communicate in more than one dialect. According to Chatterji (1921), these dialects can be divided into four major groups- Western, North central, Northern, and Eastern (with South-eastern sub-group). The Eastern dialects serve as the primary colloquial language of the Dhaka district. In Dhaka and its surrounding dialect, a vowel is inserted between the consonant clusters and also a consonant is deleted word-finally in loanwords as consonant simplification processes (examples presented in 1 a & b), an investigation of which is the focus of this paper.

3 Word final Clusters

Word final consonant clusters are also very rare in NB words with just a few exceptions. Example of one such exception is: /ganj/ "part of a place name" as in /nababganj/ "name of a place" (Kar, 2009). Word final consonant clusters are mainly found in OB cases in Bangla. For instance, /panṭ/ [panʈ] 'pant' (<English), /dost/ [doʃt] 'friend' (<Persian) etc. The following are a set of word final consonant clusters available in OB stratum of standard Bangla lexicon:

© 2011 Khaled Karim

(2) a. Nasal+Obstruent clusters: ŋk, nɖ, nʈ, mp
b. Liquid+Obstruent clusters: rk, rc, rɟ rbʰ, rɖ, rʈ, lʈ
c. Obstruent+Obstruent clusters: pʰʈ
d. Liquid+Nasal clusters: rn, rm, lm
(Kar, 2009).

These clusters are mostly English words that mostly contain obstruent as the second member of the cluster. Liquids and nasals are mostly the first member in the clusters with one exception of obstruent. Word-final consonant clusters with coronal obstruents are also found in OB stratum of standard Bangla, which are presented in (3).

(3) Word-final consonant clusters with coronal obstruents: rs, rsʈ, sk, ks (Kar, 2009).

Epenthesis is the most common repair strategy for OB in Dhaka dialect by a large margin. However, there is also evidence of deletion repairs in certain situations. In case of the adaptation of OB English words with word-final clusters in Dhaka dialect, interestingly, both vowel epenthesis and deletion of segments occur. Vowel epenthesis occurs only in 'liquid +nasal' clusters. But, deletion of consonant occurs in cases of 'nasal+obstruent', 'liquid+obstruent', and 'obstruent+obstruent' clusters. The examples of vowel epenthesis are presented in (4).

(4) Vowel epenthesis in word-final 'liquid+nasal' clusters of OB in Dhaka dialect:

Cluster	**OB Stratum**		**Dhaka dialect**	**Meaning**
rn	hɔrn	→	hɔrɔn	'horn'
rm	pʰɔrm	→	pʰɔrɔm	'form'
lm	fɪlm	→	fɪlɪm	'film'

As we can see from data in (4), epenthesis occurs between a word-final liquid and nasal.

Examples of word final consonant deletions are presented in (5).

(5) a. Deletion in word-final 'nasal+obstruent' clusters of OB in Dhaka dialect:

Cluster	**OB Stratum**		**Dhaka dialect**	**Meaning**
ŋk	baŋk	→	baŋ	'bank'
nɖ	paunɖ	→	paun	'pound'
nʈ	panʈ	→	pan	'pant'
mp	lamp	→	lam	'lamp'

© 2011 Khaled Karim

b. Deletion in word-final ‘liquid+obstruent’ clusters of OB in Dhaka dialect

Cluster	OB Stratum		Dhaka dialect	Meaning
rk	park	→	pak	‘park’
rc	ʈɔrc	→	ʈɔc	‘torch’
rbʰ	narbʰ	→	nabʰ	‘nerve’
rɖ	borɖ	→	boɖ	‘bord’
rʈ	sarʈ	→	saʈ	‘shirt’
lʈ	belʈ	→	bel	‘belt’

c. Deletion in word-final ‘obstruent+obstruent’ clusters of OB in Dhaka dialect

Cluster	OB Stratum		Dhaka dialect	Meaning
pʰʈ	lipʰʈ	→	lipʰ	‘lift’

(Data source for (4) and (5): OB words- Kar, 2009; Dhaka dialect- Author’s own speech)

As presented in (5), deletion repairs occur in different patterns. With ‘nasal-obstruent’ clusters, as presented in (5a), the word-final obstruents get deleted but in case of ‘liquid-obstruent’ clusters, the liquids get deleted, as presented in (5b). In (5c), a word-final stop is also deleted.

Again, as it is evident from the above data in (5b), that, there are differing deletion processes for ‘[l]-obstruent’ clusters and ‘[r]-obstruent’ clusters. In cases of the ‘[l]-obstruent’ clusters, the word final obstruents are deleted. For example,

(6)	/belʈ/	→	[bel]	‘belt’
	/salʈ/	→	[sal]	‘salt’
	/golɖ/	→	[gol]	‘gold’

But in cases of ‘[r]-obstruent’ clusters, the liquid /r/ that precedes the final consonant tends to get deleted. For example,

(7)	/sarʈ/	→	[saʈ]	‘shirt’
	/park/	→	[pak]	‘park’

4 Analysis of Vowel Epenthesis and Consonant Deletion Processes in Word-final Clusters

It has been mentioned in section 3, that, word-final clusters are only found in OB words in standard Bangla. In case of the adaptation of OB English words with

© 2011 Khaled Karim

word-final clusters in Dhaka dialect, both vowel epenthesis and deletion of segments occur. It is evident from the data presented in 3, that occurrence of consonant clusters word-finally is also not allowed in the Dhaka dialect. Therefore, a high-ranked markedness constraint *COMPLEX^{COD} (Kager, 1999) is active in Dhaka dialect, which can be defined as in (9).

(9) *Complex^{CODA}
‘Codas are simple’ (Kager, 1999).

This constraint requires that the coda should not be complex. The outputs with word final consonant deletions in Dhaka dialect will violate the constraint ANCHOR-R, which does not allow any deletion at the right edges of the output. This constraint can be defined as in (10).

(10) ANCHOR-R
‘Any segment at the right periphery of the output has a correspondent at the right periphery of the input’ (Kager, 1999).

Other constraints that we need to account for the word-final deletion is the faithfulness constraint MAX-IO, as the output with a deletion will be possible with the violation of this constraint. Also, we need DEP-IO and CONTIG C-Stop as the outputs with epenthetic vowels will violate these two constraints. These constraints are defined in (11), (12) and (13).

(11) MAX-IO
'Input segments must have output correspondents (No deletion)'
(Kager, 1999).

(12) DEP-IO
'Output segments must have input correspondents (No epenthesis)'
(Kager, 1999)

(13) CONTIG C-Stop
‘An adjacent Consonant and Stop sequence standing in correspondence in the input form a contiguous string, as do the corresponding portion in the output’[2].

The constraint in (13) has been formulated generally for any C, rather than /s/, so that it can be extended to other clusters as well. Also, in all cases, ‘C-Stop’

[2] Acknowledgement: Thanks to Dr. Suzanne Urbanczyk (personal communication) for suggesting this approach.

© 2011 Khaled Karim

sequences remain contiguous in Dhaka. However, these constraints alone cannot predict the different deletion patterns evident in ‘nasal-obstruent’ and ‘liquid-obstruent’ clusters. This deletion patterns in Bangla is fairly complex and I propose that the factor that determines the behavior of the word-final clusters is perceptual salience (Cote, 2004). According to Cote (2004), “only the least salient consonants may delete and frequency of deletion correlates with the relative perceptibility of the consonants” (p. 167). Cote adds that, “postvocalic consonants benefit from the cues present in vocalic transition” (p. 166), thus these consonants become perceptually stronger and less subject to deletion than the cluster-final consonants. This observation suggests that a constraint that does not allow deletion of consonants that are adjacent to a vowel. This perceptual salience based constraint is MAX-C/V (Cote, 2004) and it is defined as in (14).

(14) MAX-C/V
‘Do not delete a consonant that is adjacent to a vowel’ (Cote, 2004).

This constraint, I propose, is active in Dhaka dialect. Also, this claim that the perceptually salient consonants are not deleted, I think, clearly explains the reason why word final ‘nasal-obstruent’, ‘liquid [l]+obstruent’ and ‘stop-stop’ clusters in Dhaka dialect allows outputs where word-final consonants are deleted. To account for vowel epenthesis in ‘liquid+nasal’ clusters, we need two lower ranked faithfulness constraints DEP-IO and CONTIG-IO. DEP-IO has been defined in (12) and CONTIG-IO can be defined as in (15).

(15) CONTIGUITY-IO
'The portion of S_1 standing in correspondence forms a contiguous string, as does correspondent portion of S_2' (Kager, 1999).

4.1 Constraint ranking and tableaux

The optimal candidates will violate the faithfulness constraints ANCHOR-R and MAX-IO, therefore, they need to be crucially ranked lower than the markedness constraint *Complex^{CODA} to determine optimal candidate in Dhaka. The constraint MAX-C/V also needs to be crucially ranked higher than ANCHOR-R and MAX-IO to determine that the candidates with the deleted consonant adjacent to vowel will get ruled out. To account for deletions in ‘nasal-obstruent’, ‘liquid[l]+obstruent’ and ‘stop-stop’ clusters, we need CONTIG C-Stop and this constraint is crucially ranked higher than DEP-IO to make sure that candidates with an epenthetic vowel get ruled out.

To account for vowel epenthesis in ‘liquid+nasal’ clusters, CONTIG-IO, and DEP-IO need to be crucially ranked lower than *Complex^{CODA} , MAX-C/V and MAX-IO. Also CONTIG C-Stop is not required to account for the epenthesis

© 2011 Khaled Karim

process, because there are no oral stops in these clusters. Thus, the ranking of constraints to account for word-final deletions in Dhaka dialect should be like in (16) and to account for vowel epenthesis, which is evident only in ‘liquid+nasal’ clusters, should be like in (17).

(16) *ComplexCODA , MAX-C/V, CONTIG C-Stop >> MAX I-O, ANCHOR-R, DEP-IO

(17) *ComplexCODA , MAX-C/V, MAX I-O >> CONTIG-IO, ANCHOR-R, DEP-IO

What follows now are tableaux to demonstrate how word-final deletion and epenthesis is obtained in Dhaka. The tableau in (18) demonstrates the deletion processes of ‘nasal+obstruent’ clusters, tableau (19) demonstrates deletion process evident in ‘liquid[l]+obstruent’ clusters, and tableaux (20) demonstrate deletion process of ‘stop+stop’ clusters. The vowel epenthesis in ‘liquid+nasal’ clusters has been presented in (21), followed by a discussion about the deletion of [r] in ‘liquid[r]+obstruent’ clusters.

(18) Tableau: Word-final consonant deletion in ‘nasal+obstruent’ cluster of OB in Dhaka dialect following the constraint ranking presented in (16).

/panʈ/ ‘pant’ (OB)	***Complex^{CODA}**	**MAX-C/V**	**CONTIG C-Stop**	**MAX-IO**	**ANCHOR-R**	**DEP-IO**
a) panʈ	*!					
b) paʈ		*!		*		
→ c) pan				*	*	
d) pa.naʈ			*!			*

In this tableau, candidate c) [pan] is a winning candidate. Although it violates the faithfulness constraint MAX-IO and ANCHOR-R, it satisfies the higher ranked constraints. Candidate a) [panʈ] has been ruled out for violating the highest-ranked constraint *COMPLEX^{COD}. Candidate b) [paʈ] appears with the consonant that was adjacent to a vowel and thus, gets ruled out for violating MAX-C/V. Candidate c) does not violate CONTIG C-Stop because the stop is deleted; it does not stand in correspondence in the output and hence CONTIG C-Stop is vacuously obeyed. Candidate d) [pa.naʈ] loses for violating crucially ranked constraint CONTIG C-Stop. The next 2 tableaux (in (19) and (20)) further demonstrate how cluster-final consonant deletion of OB words in Dhaka dialect is motivated by the higher ranked constraints Complex^{CODA}, MAX-C/V, and CONTIG C-Stop.

© 2011 Khaled Karim

(19) Tableau: Word-final consonant deletion in 'liquid [l]+obstruent' cluster of OB in Dhaka dialect following the constraint ranking presented in (16).

/golɖ/ 'gold' (OB)	***Complex^{CODA}**	**MAX-C/V**	**CONTIG C-Stop**	**MAX-IO**	**ANCHOR-R**	**DEP-IO**
a) golɖ	*!					
b) goɖ		*!		*		
→c) gol				*	*	
d) go.loɖ			*!			*

(20) Tableau: Word-final consonant deletion in 'stop+stop' cluster of OB in Dhaka dialect following the constraint ranking presented in (16).

/lipʰʈ/ 'lift' (OB)	***Complex^{CODA}**	**MAX-C/V**	**CONTIG C-Stop**	**MAX-IO**	**ANCHOR-R**	**DEP-IO**
a) lipʰʈ	*!					
b) liʈ		*!		*		
→c) lipʰ				*	*	
d) li.pʰiʈ			*!			*

In the tableau presented in (19), the candidates c) [gol] and in tableau in (20), candidate c) [lipʰ] are winning candidates as they satisfy higher ranked constraints Complex^{CODA}, MAX-C/V, and CONTIG C-Stop, while rest of the candidates each violates one of those candidates and get ruled out for violating them.

The tableau in (21) demonstrates the vowel epenthesis process. As it was presented in (4), vowel epenthesis is evident only in word-final 'liquid+nasal' clusters in OB of Dhaka dialect. For example, /hɔrn/ 'horn'→ hɔrɔn; and /fɪlm/ 'film'→ fɪlɪm. Both 'liquid [r]+nasal' and 'liquid [l]+nasal' clusters of OB words experience vowel epenthesis in Dhaka. Tableau in (21a) presents vowel-epenthesis in 'liquid [r]+nasal' clusters and in tableau (21b), the vowel-epenthesis process in 'liquid [l]+nasal' clusters.

(21) a. Tableau: Word-final vowel epenthesis in 'liquid [r]+nasal' cluster of OB in Dhaka dialect following the constraint ranking presented in (17).

/hɔrn/ 'horn' (OB)	***Complex^{CODA}**	**MAX-C/V**	**MAX-IO**	**CONTIG-IO**	**ANCHOR-R**	**DEP-IO**
a) hɔrn	*!					
b) hɔn		*!	*	*		
c) hɔr			*!		*	

© 2011 Khaled Karim

→d) hɔ.rɔn				*		*

(21) b. Tableau: Word-final vowel epenthesis in ‘liquid [l]+nasal’ cluster of OB in Dhaka dialect.

/fɪlm/ ‘film’ (OB)	*Complex^{CODA}	MAX-C/V	MAX-IO	CONTIG-IO	ANCHOR-R	DEP-IO
a) fɪlm	*!					
b) fɪm		*!	*	*		
c) fɪl			*!		*	
→d) fɪ.lɪm				*		*

In the tableaux presented in 21 (a) and 21 (b), the candidates d) [hɔ.rɔn] and [fɪ.lɪm] are winning candidates as they satisfy higher ranked constraints Complex^{CODA}, MAX-C/V, and CONTIG C-Stop. Their violations of lower ranked constriants CONTIG-IO and DEP-IO are considered less costly. Candidates in a) in both the tableaux get ruled out for violating highest ranked constraint *Complex^{CODA}. Candidates in b) violate 3 constraints but get ruled out for violating higher ranked MAX C/V. Finally, candidates c) in both the tableaux violate MAX-IO and ANCHOR-R but they lose for violating MAX-IO as it was crucially ranked over ANCHOR-R.[3]

4.2 An account of the deletion of /r/ in ‘liquid[r]+obstruent’ clusters

The focus of this section is on the deletion of /r/ in ‘liquid[r]+obstruent’ clusters word finally in Dhaka dialect. While the cluster-final obstruent gets deleted in ‘liquid [l]+obstruent’ clusters, the /r/ in ‘liquid [r]+obstruent clusters tends to get deleted (data presented in (48)). Following Cote’s (2004) analysis of /r/ deletion in Qubec French, I interpret that /r/ in the Dhaka dialect becomes subject to deletion in post-vocalic position. According to Cote, in post-vocal positions, /r/ becomes a vocalic off glide and may even reduce to nothing. This happens when /r/ is in absolute word final position and when it is followed by a consonant. Thus this apparent deletion of /r/ in ‘[r]+obstruent’ clusters in Dhaka, in fact, is a process of merger of /r/ with the preceding vowel (Cote, 2004). Cote (2004) also added that /r/ can be considered as a glide in post-vocalic position (e.g., in Quebec French) which helps to take place the cluster simplification by effectively reducing /r/-initial word-final clusters to a single consonant. Based on this interpretation, the constraint MAX-C/V (defined in (50)), which motivates the

[3] In the tableaux in 56 (a & b), CONTIG C-Stop was not included to save space, and also due to the fact that, this constraint is not relevant here, as none of the words in the tableaux have oral stops.

© 2011 Khaled Karim

optimal output for word-final 'nasal+obstruent' 'liquid [l]+obstruent' and 'stop+stop' clusters in Dhaka dialect, is also not violated by the output with the deleted /r/ in 'liquid[r]+obstruent' clusters (i.e., when /park/→[pak] 'park' (OB).

This interpretation of /r/ deletion in word-final 'liquid [r]+obstruent' clusters in Dhaka dialect can be extended to a perception-based interpretation of loanword adaptation as well, as in the Perception Approach (Peperkamp & Dupoux, 2003). According to the Perception Approach, the changes of non-native sounds in loan words are made at the perceptual level and it does not always involve phonology (Lin, 2009). Lin (2009) adds that, loanword adaptations are "influenced rather than computed by phonological grammar" (p. 1). As Bangladesh was under British rule for over 200 years, British English is predominantly spoken there. As we know, British English does not pronounce [r] in the word-final 'liquid [r]+obstruent' contexts. Thus, in Dhaka dialect /r/ might not be in the input. People in Dhaka may not hear /r/ in '[r]+obstruent' contexts or as Cote (2004) interpreted, due to /r/ 's merger with preceding vowel they might perceive /r/ as a vowel. Thus it can also be interpreted as an effect of auditory perception of English source language form by borrowing language speakers of Dhaka dialect.

5 Conclusion

This paper has presented an OT analysis of the different deletion processes found in 'nasal+obstruent' 'liquid [l]+obstruent', 'liquid [r]+obstruent' and 'stop+stop' clusters and the only epenthesis process evident in 'liquid+nasal' clusters of OB word adaptation into Dhaka dialect. With tableaux, it has been demonstrated that a high-ranked markedness constraint *COMPLEX^{COD} (Kager, 1999), is active in Dhaka dialect. Also, while MAX-C/V motivates the optimal outputs with a deleted consonant in 'nasal+obstruent' 'liquid [l]+obstruent' and 'stop+stop' clusters, the vowel epenthesis in 'liquid+nasal' clusters is allowed by two lower ranked faithfulness constraints CONTIG-IO and DEP-IO. Finally, it has been interpreted that the apparent /r/ deletion in 'liquid [r]+obstruent' clusters of OB is a process of merger of /r/ with the preceding vowel (Cote, 2004) or it is an effect of auditory perception of English source language form (i.e., perceiving /r/ as a vowel) by borrowing language speakers of Dhaka dialect.

References

Chatterji, S K. (1926). The Origin and Development of the Bengali Language. Calcutta University, Calcutta.

Chatterji, S. K. (1921). Bengali phonetics. Bulletin of the School of Oriental Studies, 2(1), 1-25.

© 2011 Khaled Karim

Cote, M. (2004). Consonant cluster simplification in Quebec French. Probus, (16), 151-201.

Gouskova, M. (2001). 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.

Kager, R. (1999). Optimality theory. Cambridge: Cambridge University Press.

Kar. S. (2009). The syllable structure of Bangla in Optimality Theory and its application to the analysis of verbal inflectional paradigms in Distributed Morphology. Unpublished Doctoral Dissertation. Url: http://tobias-lib.uni-tuebingen.de/volltexte/2009/3864/. Retrieved October 24, 2009.

Lin, Y. (2009). Loanword adaptation and phonological theory. Proceedings of the 21 North American Conference on Chinese Linguistics (NACCL-21). 2009. Volume 1. Edited by Yun Xiao. Smithfield, Rhode Island: Bryant University. Pages 1-12.

McCarthy, J. J. & A. Prince. (1993a). Generalised alignment. In G. Booij & J. van Marle (Eds.), Yearbook of Morphology 1993 (pp. 79-153). Doedrecht: Kluwer.

Prince, A. & P. Smolensky. (1993). Optimality theory: constraint interaction in generative grammar. Ms., Rutgers University, New Brunswick and University of Colorado, Boulder. Later published as in 2004 from Blackwell Publishing, Malden, MA.

Peperkamp, S. &Dupoux, E. (2003). Reinterpreting loanword adaptations: the role of perception. ICPhS, 15, 367-370.

Shahidullah, M. (1965). Bangla Bhasar Itibirtto. Mowla Brothers, Dhaka.

© 2011 Khaled Karim