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Optimality Theory in Bangla Phonology: Introducing Specific Constraints

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ABSTRACT

Optimality Theory is a recent innovative model for the authentic solution of raising problems in the field of linguistic research. This grammatical model evaluates numbers of linguistic forms which mostly resembles to each other except a very sensitive difference and among which only one can be optimized as correct one. This grammar finds out the correct candidate and rules out the incorrect combination through the application of few constraints. Some of phonological forms in Bangla is shown here to be optimized thorough this models.

KEYWORDS OT, Constraints, English, Bangla, Dialect, etc.

1.0 Introduction

The modern linguistic study ranges from language to dialect, traditional linguistics to recent technical model of linguistic research. As the area of research is broadened, techniques of research are also being enriched through application some innovative models. The recent models help seeking immediate solution to any difficult problems of linguistic research. Such an excellent model of linguistic research is the Optimality Theory (Prince & Smolensky 1993). Researchers of linguistics are successfully utilizing this model for more than last ten years. This paper introduces an OT analysis of Bangla phonology.

2.0 Optimality Theory

Optimality Theory is a general model of how grammars are structured. Optimality Theory (OT) is a linguistic model proposing that the observed forms of language arise from the interaction between conflicting constraints. OT models grammars as systems that provide mappings from inputs to outputs; typically, the inputs are conceived of as underlying representation, and the outputs as their surface realizations. A surface form is 'optimal' in the sense that it incurs the least serious violation of a set of violable constraints, ranked in a language-specifics hierarchy.

2.1 Constraints and their Functions

Constraints are universal. Languages differ in ranking the constraints, giving priorities to some constraints over others. Such ranking are based on 'strict' domination: if one constraint outranks another, the high ranked constraint has priority, regardless of violation the lower-ranked one. However, in Optimality Theory, there are two main types of constraints. On the one hand there are structural constraints (syllable constraints) that demand output to be structurally unmarked, while on the other hand there are faithfulness constraints that demand outputs to be faithful to their inputs whether these are structurally marked or not (Fery & Vijver 2003). Beside the universal constraints, every language has its some specific constraints. Here the paper is introducing some such constraints for phonologically analyzing Standard Colloquial Bangla (SCB) and its dialect Noakhali Bangla (NKB).

3.0 Optimality Grammar in SCB and NKB

Since every language in the world does not have syllables in accordance to the surface form CVCVCV, it is the job of some constraint interaction to optimize the unmarked syllables in a language. When onset and coda are concerned, complexity in them is expected. Both margins in languages may employ combination of consonantal segments. Whatever may be the combination, but such combination should be in a perfect sonority format, that is they should obey the Sonority Sequencing Principle. This principle claims that in a syllable, sonority should increase towards the peak and decrease towards the margins. The nucleus contains the most sonorous segment, while the less sonorous ones occur towards the margins. To quote Clements (1990: 299): "Sequence of syllables display a quasiperiodic rise and fall in sonority, each repeating portion of which may be termed as sonority cycle."

3.1 Sonority Sequence in Bangla Syllable Boundary Clusters

This sonority sequencing arrangement is not merely applied syllable initially or finally, it is also well applicable in syllable boundary level. Cross-syllabically, the boundary atmosphere also happens according to SON-SEQ, where the previous coda falls in sonority and the following onset again rises in sonority. For example, in SCB, /tor.kO / is restructured as /tok.ro/ 'argument' in NKB. In this output, the coda /k/ of the first syllable is less sonorous than the following onset /r/. So, one falls in less sonority and another rises with more sonority. But, in the SCB input, the coda of the previous syllable ends with more sonority then the sonority of the onset of the following syllable. So the syllable boundary cluster in SCB /tor.kO/ 'argument' does not happen according to the constraint SON-SEQ. Alternatively, it is also a fact that when these syllables are analyzed in isolation, both /tor.kO/ and /tok.ro/ happen in accordance to the sonority sequencing principle.

On the other hand, there is also another constraint that is seriously violated in the second scalar representation of NKB form /tok.ro/. According to SYLL-CON (SYLLABLE CONTACT LAW), sonority should not rise across the syllable boundary. The sonority in this position can either be equal, or it may be such that the following onset will not more sonorous than the preceding coda, as it happens in SCB /tor.kO/. But in /tok.ro/, sonority rises at the boundary level, where /k/ is less sonorous than /r/. Hence, according to SYLL-CON, it can be assured that the boundary cluster of NKB /tok.ro/ 'argument' is not well formed. While two particular constraints are employed to examine wellformedness of the syllable boundary clusters in SCB and NKB, it is found that one of the two constraints is violated in each of the dialects: NKB /tok.ro/ violates SYLL-CON and SCB /tor.kO/ violates SON-SEQ. It is perhaps, for this reason that /tor.kO/ is often realized in NKB as /tok.ko/, what is also a standard form having the well balanced sonority figure in SCB.

Moreover, a general solution to this conflict between SON-SEQ and SYLL-CON is that in general cases SON-SEQ dominates SYLL-CON whose violation can be considered as minimal. Accordingly, the tabular illustration in (1) below favorably finds out the optimal output /tok.ro/ in NKB corresponding from the SCB input /tor.kO/. On the contrary, in SCB, the constraint SYLL-CON dominates SON-SEQ to find out the optimal output through a binary constraint interaction, as in tableau (2):

(1) NKB optimal output

INPUT: /tor.kO/	SON-SEQ	SYLL-CON
☞tok.ro		*
tor.kO	*!	

(2) SCB optimal output

INPUT : /tor.kO/	SYLL-CON	SON-SEQ
tok.ro	*!	
☞tor.kO		*

3.2 The Emergence of Unmarked Syllables in NKB

The output-oriented faithfulness constraints for unmarked syllables are in fact, the basic reasons for the application of few cluster breaking repair strategies in NKB. These repair strategies modify the marked syllable structure or 'bad-syllable contact' (Bradley 2006) for tautosyllabic forms in NKB. The present section approaches a constraint-based analysis concerning the emergence of NKB unmarked syllables. It is in fact, because of the universally employed some markedness constraints that favor the unmarked syllables in languages. It is also for the domination of few language-specific phonotactic constraints that some particular clusters are avoided in some particular languages. Generally, SCB clustered forms are repaired in NKB, while SCB also does not have multiple kinds of complex C-clusters. But whatever may be the clusters in SCB, they are avoided when they appear in NKB oral communication. While *CLUSTERS is the most dominating universal markedness constraints for syllables, constraints such as *[Cr σ, *[Cn σ, *[Cl σ, *[Cp σ, *[Ct σ, *[Ct^h σ, *[Ck σ and *[Ck^h σ are the phonotactically marked constraints in NKB that ignores the marked tautosyllabic clusters present in the input SCB variety. This is different realization of the universal constraint *CLUSTERS that those phonotactic constraints in particular are put into service. So while universality is ruling from the top, the phonotactics realizes the universality from the lower level.

The input Cr, Cn and Cl clusters satisfy the sonority sequencing principle (Kager 1999: 267) that complex onset rises in sonority and complex codas fall in sonority as in /pran/ 'life' and /snan/ 'bath'. In Cl cluster, the sonority level remains the same only when the first C is the nasal /m/ as in /mlan/ 'gloomy'. Of course, in the remaining four C-combinations, the sonority sequencing remains unbalanced since there the first C will necessarily be the fricative /s/ and it has more sonority than the second plosive Cs as /p t t^h k k^h/. SON-SEQ is such a constraint that dominates over SCB complex clusters. In SCB, the universality of syllable structure that the syllable margins should be preferably simple is extremely violated by complex clusters. But in NKB, this universality is enriched through few realizing constraints in favor of *CLUSTERS. The following tableaus illustrate constraint ranking orders for achieving the optimal outputs in SCB and NKB respectively:

(3) SCB optimal output

INPUT : (SCB) pran	SON-SEQ	MAX-IO (seg.)	*CLUSTERS
☞pran			*
pan		*!	

(4) NKB optimal output

INPUT: (SCB) pran	*CLUSTERS	MAX-IO (seg.)	SON-SEQ
☞ho.ran			
pran	*!		
pan		*!	

Thus, repair strategy like V-epenthesis phonotactically rearranges the syllable structure permissible in NKB syllables corresponding from SCB input syllables. It is probable that in NKB, the leading constraint *CLUSTERS demands the underlying C segments in every case to be concretely released without any neutralization, weakening or simplification. Otherwise, one of the C segments of the sequence CC, tends to be unreleased totally as it is articulated in its isolated form. Ohala (1990) and Steriade (1995b) also viewed the same thing, while they were analyzing the simple onset and simple codas in languages (Kager 1999: 94). So, while simple onsets and simple codas are concerned, three possible syllable structures are consequent, as CV, CVC and VC. NKB has these three syllable types and occasionally a V type syllable. Again, CV is the most preferred or 'perfect' syllable shape among those four shapes. A constraint NO-CODA rules out CVC, VC and the constraint ONSET dominates over the V type syllable as 'less perfect' syllable shape. The constraint NO-CODA demands syllables to be open or not to be ended in a consonant, what is also a cross-linguistic preference.

It is for this reason that the syllable final codas in languages are often supplied with an epenthetic V so that a further CV is affected, as in NKB /zoT/ à /zo.Da/ 'fibrous hair'. While epenthesis is concerned, there may arise conflict between the well-formedness constraints and faithfulness constraints as the epenthetic segment does not have any counterpart in the input. Thus, ONSET and NO-CODA sometimes give violation to the faithfulness. For example, in /gQ.ram/, /Q/ violates the faithfulness relationship between the input and the output. Kager (1999: 98) gives a solution to this violation at the expense of faithfulness: "…The costs of inserting a (non-underlying) segment are less than those of imperfect syllable structure." In fact, to say of the conflict of well-formedness constraints and the faithfulness constraints in NKB unmarked syllables, it is better to say that faithfulness constraint is dominated by the well-formedness constraints as in the tableau below:

(5) Well-formedness >> Faithfulness

INPUT	Well-formedness	Faithfulness
☞Candidate 1		*
Candidate 2	*!	

(6) Well-formedness >> Faithfulness NKB unmarked syllables

INPUT	Well-formedness	Faithfulness
☞gQ.ram		*
gram	*!	

4.0 Conclusion

Utilizing the Optimality Theoretic grammar, the two issues (among many others) of Bangla phonology are linguistically solved in this research paper. The sonority sequencing of the syllable boundary clusters in SCB and NKB can easily be examined similarly in the way as in the above form. SON-SEQ and SYLL-CON are the two leading constraints to optimize such boundary clusters. On the other hand, *CLUSTERS and its language-specific supporting constraints evaluate the unmarked syllables in NKB. These constraints rule out the clustered syllables in SCB and rule in the unmarked syllables in NKB.

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