Aspects of Epenthesis across Different Bangladeshi (Bangla) Dialects: Analysis from Various Phonological Perspectives

Naywaz Sharif Shubha
University of Dhaka

1 Introduction

Many of the early research on Bangla epenthesis have focused on the English loan words of the Bengali language, like the study of Karim (2010). However Chung (2019) has focused on the consonant clusters adapted from the English language (included many instances of epenthesis) to Bangla dialects, but didn't focus on the aspects of the native Bengali words (the focus being only on the loans from English). Kar (2009) has illustrated the data from Bangla like /iskul/ which comes from the word /skul/ for the English word "school". However, the current paper tries to focus on the aspects of the epenthesis that take place on the dialect level lexicon of the Bengali language, especially those that are native Bangla words, to be exact the dialect words. This aspect has rarely been discovered or researched in the Bengali Language although there exist similar research on epenthesis in dialects of other languages like Arabic, Nepalese, German, Gaelic etc. (Hall, 2013; Ohala & Ohala, 1991;Golston & Wiese, 1996; Clements, 2016) Moreover, many other types of research in different languages have also demonstrated the epenthetic analysis with the Optimality Theory (OT) and other supra-segmental analyses; however, in the present study these different approaches have been combined together for bringing a comprehensive understanding of the underlying complexities between the epenthesized words of the dialects and the standard language.

2 Theoretical Background

2.1 *Past studies on Bangla epenthesis and existing issues* Examples of epenthesis in Bangla can be found in past research studies where English words realized by Bangla speakers (loan words) have been exemplified (Karim, 2010); and in most of those examples words with onset clusters had been modified in Spoken Bengali and there were no changes in the Standard Bengali (eg. /frʌnt/ becomes /fərʌnt/ in spoken Bengali, but doesn't change in Standard Bengali). Different epenthetic processes can be found in other examples in the Bangla language, where the onset clusters and the epenthesis process are realized as different. However medial consonant clusters are allowed in the Bangla language (Chung, 2019). Chung (2019) also shows examples from the Dhaka dialect (all of which are the loan words of English) where coda clusters are modified by insertion of a sound and those examples were adopted from the study of Karim (2010). Additionally, Chung (2019) cites the deletion in some cases of epenthesis and which is also supported by the data in the present study.

After bringing the examples from Karim (2010) in his study, Chung (2019) goes onto criticize and reevaluate the study for having less structured/ logical aspects on the epenthetic process and proposes his own views and modifications on those aspects with the help of the Optimality Theoretic approach (with different ranking constraints and schematic representations). Lombardi (2003) in his study similarly brings discussion with the same approach, particularly focusing on the typology, markedness etc. of the epenthetic vowels; results in more of a theoretical discussion on OT.

In a next paper on epenthesis, Karim (2011) brings the vowel epenthesis in the loan words' final position of the Dhaka Dialect (Bangladeshi), and particularly the point should be emphasized that the work don't focus on other different dialects of Bengali where epenthesis also takes place. In that study, he represented the phenomenon of deletion taking place along with the epenthesis process, which is also found in a large number of our surveyed data. A very interesting fact is that in all of the earlier research works on Bangla epenthesis- the theories, related explanations and their applicability only focus on the loan words or borrowed words [mostly from English] (Karim, 2010) or the realization of the foreign words by the Bengali speakers (Chung, 2019) - thus making the scope of those studies more restricted and narrower; especially for relating the analysis only to the non-native words of Bangla. Chung (2019) however added Dhaka dialect with the Sylheti Dialect and then discusses the whole issue of epenthesis, which are mostly borrowed from Karim (2010); his constraint-based analysis gives some further insights on the topic.

Proceedings of *AJL 6*

3 Methodology & Data Collection

Many earlier research studies on epenthesis in different languages adopted the approach of collecting data from certain texts, ongoing conversations, recordings or certain or specified corpus data. Some research even cited data sources from the author himself (see, Karim, 2010). However, in the present research, a different approach has been undertaken, the data for epenthesis in dialects was collected from a number of informed participants (N=33) who had been given an overall explanation about the topic of the epenthesis (how sounds change and how the sounds are inserted); additionally, they were also given instructions on the survey form- how does the change take place, how the data should be input in the form etc. Finally, they provided consent that they understood the process. All of these participants were the students of the University of Dhaka, pursuing their undergraduate degrees, who were native Bengali speakers and the data collection process was initiated and finished in December 2020, in a span of one week.

4 Results and Analysis

4.1.1 *Number of Dialects and their Geographical Distributions* In the surveyed data; it was found that all the participants came from around 20 districts amongst the total 64 districts of Bangladesh. All the found districts were listed in alphabetical order, after leaving out or cleaning the duplicates. It is because there were multiple respondents among the participants who came from the same districts and also had the same dialects. Thus after the cleaning process, only 20 dialects from 20 districts were counted from the 33 respondents' data.

After conjugating all of the districts, then their respective positions was located, the standard range was calculated from the Central Bangladesh. The locations of those parts indicate that majority of the districts were from the Southern part of Bangladesh. Others were from the Central parts and the least number of districts were from the Northern part of Bangladesh.

4.1.2 *Quantification of Epenthesis* The data that was collected from the survey; then was transcribed into standard IPA from the Bengali orthographic forms (the responses). After transcription of the IPA format, it was clear and easy to count the syllables, and find the vowels and incidence of epenthesis in the provided dialect words. Using the MS Excel files, only the epenthesized data were taken into a single sheet. Then in; the next step, the inserted sounds were counted using the algorithmic functions by matching the character of the vowel in the sheet.

The vowels were measured quantitatively, actually finding their frequencies at different positions with the help of the function of the computer program. In the majority of the cases, there were commonly found only about four vowels which were occurring again and again. A total of 120 incidents were found in the epenthesis process in the survey data. The highest occurring vowel is /i/, which occurs about 76 times (70%). When in the second place comes the vowel a, which occurred about 16 times (15%), which occurs actually one-fifth times of the first vowel /i/.

Then in the third place comes the vowel, /u/- which occurs about 13 times (12%). The least number of times the vowel inserted is /o/ (3 times, 3%). So, it is quite clear that in the Bangla epenthesis of the dialect words, vowel /i/ is inserted most often times as the dominant epenthesized vowel. The comparison between the numbers of the epenthesis has been shown in the following Table 1.

Vowels in the epenthesized words	Occurrences (N)
i	76
u	13
a	16
o	3

Table 1: Vowels (n) in the epenthesis process in the surveyed data

After counting the quantity of the vowels in the epenthesis process, the positional variance of insertion in the process was taken into consideration. So this can give us an idea of where the vowel sounds were inserted in the process of those dialect words in Bengali. Firstly, the words were marked in each of the cases where the epenthesis had been happening inside the syllable structure so that a general idea on the positional epenthesis could be derived.

Types of Epenthesis	Total
Initial epenthesis	3

Medial epenthesis	49
Final epenthesis	7

Table 2: Epenthesis at Different Positions (n) in the Data

In the whole data set, only three types of epenthesis were mainly identified- initial epenthesis, medial epenthesis and final epenthesis. After quantification of the data, medial epenthesis was found the most dominant amongst all, happening about 49 times (83%); the final epenthesis coming about 7 times (12%), and the initial epenthesis occurs only about 3 times (5%)- which is the least occurring phenomenon in these positional epenthesis.

4.2 *Structural and Supra-segmental Changes*

4.2.1 *Various Changes in Syllables* Dominantly, it is claimed that the vocalic epenthesis acts as a way of breaking difficult consonant clusters, however, in Bengali Dialects, it is found that the epenthesis acts as a way of inserting sounds even after vowels and also reduplicating the next consonant sound partially after the vowel (for example, bẽce >ba͡i̯cca). Very interestingly, vowel is also inserted word-initially before a perfect syllable structure like CV (e.g., CV.CVC (cʰilam)> V.CV.CVC acʰilam)

In some contexts, the initial consonant gets deleted and a diphthong sound is inserted in its place (hãta>a͡i̯tta). In many of the dialect words which have a consonant (liquid, nasal) followed by a vowel then there comes a sound inside the word which acts a diphthong in the word. (ʃonɖʱa>hɔinɖʱa, begun>baigun, kalke>kailka)

There are strange changes in the epenthesis process, where there are words ending in a consonant sound (with almost bounded perfectly), there a vowel is inserted inside the word for making two perfect CV syllables, CVC (rat) > CV. CV (raito). Even when a word has two complete syllables, even at that place certain pattern of consonant-vowels' cluster are inserted together- CVC. CV (korbe) > CVCV.CVCV (korahaba), which are rarely found in the examples of the epenthesis in Bangla language. Again, there are words where the consonant sounds are inserted to make a perfect syllable VC.CV.CVC (o͡i̯kɟoʈan) imperfect structure- VC.CCV.CVC (o͡i̯kkɟoʈan). This consonant insertion is somewhat near to partial reduplication of the consonant.

There are found single or double syllable structures starting with a vowel sound-like VC (aɟ),V.CV (utʰe) where there is inserted multiple vowels and also the later sound is partially reduplicated to make it into V.CCV (a͡i̯ɟɟa), VC.CV (u͡i̯[tʰæ). The stress pattern also seems to change after the epenthesis. In these words, the starting with an open syllable (with a vowel) is epenthesized by inserting another vowel in the initial position and resulting in a diphthong at the starting of the word. Such instances are also found in many other words where there is a vowel insertion after another vowel and thus the vocalic epenthesis results in a creation of a diphthong in the sound pattern.

There are words where the single-syllable words with consonant clusters [CCVC] are broken with a certain vowel sound insertion for making the pronunciation easier [CV.CVC] (e.g., klip,> kilip, bʱru> bʱuru, glas> gilaʃ).

There is also strange epenthesis, where there exist perfect syllable structures like CVC in a single syllable, yet another vowel inserted transforms it into double syllable CV.CV (e.g. raʈ > ra͡i̯to, bon> bo͡i̯no). In some data in the dialects, the syllable structure is reduced to two-syllable (CVC.CV; ra͡i̯kʰkʰa) from three syllables (CV.CV.CV; rakʰiʲa) by insertion of a vowel and a partial reduplication of the existing consonant sound inside the word (rakʰiʲa >ra͡i̯kʰkʰa).

There exists consonantal epenthesis where a nasalized vowel sound is transformed into a pure nasal consonant with the insertion of another vowel sound (after the epenthesis process the pre-existing vowel becomes a diphthong) inside the lexicon [CV.CV (kãɖa) > CVC.CV (ka͡i̯nɖa)].

There are contexts where the vowel epenthesis and the consonantal epenthesis occurs at the same time in two different syllables, where the previous vowel becomes diphthong and the later inserted consonant makes the perfect symmetric CV.CV structure turns into an asymmetric CV.CVC structure. [kʰabo > kʰa͡i̯ʲum, ɟabo > ɟa͡i̯ʲum,] These changes are the most difficult to find meaning to the root words. However, the opposite insertion is also possible, where the consonant is inserted in the first syllable (partial reduplication of the consonant) and the vowel is inserted in the second syllable but the process remains the same, breaking the perfect symmetric CV.CV structure to an imperfect asymmetric CV.CVC syllable structure. [mɔla > mo͡i̯lla]

In most cases there are no changes in the syllable structure of the word after the epenthesis is completed, thus it is also a major part of the process that shows strict domination to the root and thus brings coherency for the word meaning without much change of the base form of the word. In most of the cases, the vowel insertion or vocalic epenthesis is resulted in the 'Diphthongization' (Goldstein, 2013) of the primary vowels. A glimpse of such changes can be found in the following table-

(1) Syllable Changes : Strong similarity to Roots*

i) ʃɔnɖʱa > ʃɔi̯nɖʱa (evening), ʃoʈʈo > ʃɔi̯ʈʈo (truth)
ii) aɟke, > ai̯ɟke (today) , raʈer > rai̯ʈer (night)
iii) kalke > kai̯lke (tomorrow) , aʃe > ai̯ʃa (come)
iv) geye>gaiye (sing), tɔmeto > tamatu (tomato)
v) coɖɖo> coi̯ɖɖo (fourteen) , dal > dai̯l (split peas)
vi) beca> bei̯ce (to live) , mɔla > moi̯lla (a fish name)
*many more similar changes which can be found in the collected data.

4.2.2 *Changes in the structures: Diachronic changes related to the form of language* For explaining the changes, further analysis of the patterns in which they come to the data surveyed in our participants' contribution needs special focus or attention. One way of explaining the changes is the diachronic approach, where the changes in the current dialect data can be related to the previously existing standard form of Bangla called the /ʃaɖʱu bʱaʃa /, which was actually the Standard Orthographic Bangla (SOB) - in contrast to the Standard Colloquial Bengali (SCB) /t͡ʃoliʈo bʱaʃa/ (spoken). So, the changes that happen to the dialect words are actually due to the previously existing dominant form of Bangla language, SOB /ʃaɖʱu bʱaʃa / from where the oral changes come in the existing dialect. It is to reemphasize again that the /ʃaɖʱu bʱaʃa / was once the more standard language, however, now the Standard Colloquial Bengali (SCB)- /t͡ʃoliʈo bʱaʃa/ has become more of the standard language both in the spoken and the written form over the course of time. The changes that we are suggesting would be illustrated as the follows-

(2) Relating the Changes to the Diachronic Data in Bengali Language

Dialect Words	SOB /ʃaɖʱu bʱaʃa /	SCB /t͡ʃoliʈo bʱaʃa/
a) kai̯ta	katiʲa	kete
b) bai̯cca	baciʲa	bẽce
c) hai̯ta	hatiʲa	hata

The change can be schematically showed in the following way-

(3) Standard Orthographic Bangla (SOB) >>> Dialect Words
a) katiʲa >>> kai̯ta

So, the changes in these dialect words actually come in two stages, at first stage, the dialect data changes from the SOB /ʃaɖʱu bʱaʃa / and the /i/ vowel comes before the /t/ sound, this is an metathesis process actually because of two vowels coming in each other's place (changing the position), and then the latter sound /iʲa /which is a glide associated with a vowel, gets deleted or dropped. So, if we show the changes schematically with every sound changes inside the dialect words, then this representation would be more correct in the following way*-

* The explanation for this approach was taken from the Indian Bengali linguist Rameshwar Shaw' s analysis in his book; who reconstructed a similar explanation to be related with the /ʃaɖʱu bʱaʃa /

SOB	Changes taking place	Process	Sound
	kaitʲa	Metathesis	i and t
/katiʲa /	kait	Deletion	iʲa
	kaɪ̯ta	Epenthesis	a

Table 3: Process of Changes in the epenthesis Process

In another dialect (Narsingdi), the same word / katiʲa / changes to /kaɪ̯tta/ in quite different manner (but with the same phonemic distribution), however, some other additional changes come to the word quite distinct from previous one. Let's first represent the word's schematic changes to the dialect form as the follows-

(4) Standard Orthographic Bangla (SOB) > >> Dialect Words
a) katiʲa > >> kaɪ̯tta

This time- the changes are not so simple, rather a complex process is involved in the process. Previously, there were only two processes- Epenthesis and Deletion took place. However, this time there are four processes involved- Epenthesis, Deletion, Diphthongization and the Partial Reduplication of sounds. Let's represent the changes schematically as the previous case-

SOB	Changes taking place	Process	Sound
	kaitʲa	Metathesis	i and t
	kait	Deletion	iʲa
/ katiʲa /	kaɪ̯t	Diphthongization	aɪ̯
	kaɪ̯tt	Partial Reduplication	t
	kaɪ̯tta	Epenthesis	a

Table 4: Process of Changes in the epenthesis Process (2)

4.2.3 *Cases of Consonantal Epenthesis* In the whole collected data, the incidence of consonantal epenthesis was very rare. However, there were some examples where the consonantal epenthesis was found. But these types of consonantal epenthesis are also rare even in the Bengali Language. One of the example of consonantal epenthesis is-

(5) CV.CV (kãn̪da) > CVC.CV (kaɪ̯nn̪da) [crying]

This example inserts the nasal sound /n/ after the vocalic epenthesis of the sound /i/.

4.3 *OT Analysis in Dialect Words*

4.3.1 *Evaluating Different Dialects Data involving Optimality Theoretic Approach* First and foremost important topic to be reemphasized in adapting Karim's (2010) approach from his study here is that 'not only the borrowed or loan words in Bengali obey the rules of epenthesis, but even the native Bengali (dialect) words involved in epenthesis from the dialects are also faithful to the rules; which has not been mentioned till now in any of the earlier research studies. Continuing with the scheme proposed by Karim (2010), at the end of this paper, it would be clear that the dialect data (involving epenthesis) can be analyzed the same way, as for the loan words. Thus it is emphasized that as the changes both in the standard Bengali and also the native Bengali in epenthesis process obeys the same rules of the language; this topic can provide a chance for explaining- how the grammar and lexicon of the Standard Bengali and Bengali dialects relates to each other and the discussions can be expanded further.

At first let's take the example from the dialect of Narsingdi, from Narsingdi district under Dhaka division. The chosen word is- /siri/ which means beauty, diligent, nice etc. in the Standard Bangla and in Standard Bangla the word is considered as /sri/ with the same meaning. However, there are many other examples with the same patterns, where such clusters and epenthesis occurs in the same way as found in our surveyed data set, a glimpse on those data existing in the Bengali language would be as the followings-

(6) Examples of Bangla Epenthesis with [s]-clusters across dialects (from surveyed data)

[s]- clusters = [sibilant + rhotics sounds]

Main Word	After epenthesis	Inserted Vowels	Meaning
a) sri	siri	i	beauty
b) sri̪ti	siri̪ti	i	memory
c) sromik	soromik	o	laborer
d) sraddho	seraddho	e	death ceremony
e) sroʃta	soroʃta	o	creator
f) srabon	serabon	e	a Bangladeshi season name

Another word which would be analyzed with the Optimality Theoretic approach is the word /kelanto/ which comes from the dialect of Madaripur, from Madaripur district under Dhaka division. The meaning of the word is 'to be tired' and in Standard Bengali the word is realized as /klanto/ (without any epenthesis inside the syllable). This word is also a Bengali word (without any borrowing process); neither is it a foreign word to be considered unfamiliar. This chosen example also has got similarity with other words from some other dialects where epenthesis takes place and almost the patterns are also the same-

(7) Examples of Bangla Epenthesis with [stop+liquids]-clusters found across dialects (surveyed data)

[k]- clusters = [stops+liquid sounds' clusters]

Main Word	After epenthesis	Inserted Vowels	Meaning
a) kroʲ	koroʲ	o	to buy
b) klanto	kelanto	e	tired
c) kromagoto̪	koromagoto̪	o	chronological

Particularly, choosing the two examples- /siri/ and /kelato/ has very basic reasons for the current study. As Karim (2010) in his study states that he differentiates between the rising sonority clusters (where vowel is inserted between two consonants) and the falling sonority clusters (e.g. clusters with s-stops, where vowels inserted before the cluster). So, according to Karim (2010)-the insertion of vowels take place at two different places. However, in my gathered data I found evidences across dialects that the vowel insertions occurs only at the same place, and that is 'only in the rising sonority clusters' of the dialect words in Bengali (i.e., insertion of vowel between two consonants). This argument opposed to Karim (2010) can also be proved by applying his (the same) scheme to the current data without any changes to his proposals; and thus the scheme from Karim (2010) would be adapted to prove that epenthesis in Bengali Dialect words can only occur at the same place [inside consonant clusters], even without any changes to the 'ranked constraints order'.

So, in the Optimality Theoretic approach, the constraints are ranked in a certain order and they are violable, and the constraints can be violated by the candidates [surface realizations] coming after one another (Prince & Smolensky, 2004). The process involves marking of the constraints also in a serial order for violations in the phonological form or the structures of the candidates in the Tableau. The violations are due to the hierarchy of the constraints and the winning candidate would be that candidate which has got least serious violations (Kager, 1999). The constraints are principally divided into two- markedness and faithfulness constraints (Prince & Smolensky, 2004). Markedness constraints usually work to impose some sort of restriction the forms of the input and output, e.g. - 'syllable codas are not allowed' (NOCODA), 'syllable onsets are obligatory' (*ONSET) etc. (Kar, 2009), or others like 'no nasal followed by a consonant' (Kager, 1999). Whereas the faithfulness constraints are the ones which posit language specific characteristics on the forms for no change in the output, like- 'no deletion' (MAX-IO), 'no epenthesis' (DEP-IO) etc.

However, moving to the data from the dialects, for the words that have been chosen for the current analysis following Karim (2010) are as follows-

(8) /sri/ > /siri/
sri > si**.**ri
$C_1C_2V > C_1V.C_2V$

(9) /klanto/ > /kelanto/
klan**.**to > ke**.** lan**.**to
$C_1C_2VC_3.\ C_4V > C_1V.C_2V\ C_3$

It is agreeable with Karim (2010) that there is a restriction against the initial consonant cluster existing in a word, but, there is found no evidence what-so-ever in the whole surveyed data-set, where a specific rule should be applied for different epenthesis site for the [s]-obstruent clusters, especially in native or dialect words in Bengali. As earlier mentioned, I would be adapting the same scheme, same structure and also the same candidates and constraints from Karim (2010) for OT analysis, but I strongly disagree with the idea that a word initial vowel epenthesis is only applicable to the [s]-consonant cluster and propose that the epenthesis in [s]-consonant clusters can take place even inside the cluster, between the two consonants. For example, the word /siri/, where there is a [s]-consonant cluster, but however for its rising sonority pattern (for the sound /r/ existing after /s/), the vowel is inserted between the stop [s] and the rhotic sound [r]. For the rising sonority, Karim (2010) brings a markedness constraint, called SYLLABLE CONTACT for appropriate constraints list (Gouskova, 2001). Other constraints in that analysis include *CCONS, MAX-IO, DEP-IO, and CONTIGUITY-IO. A brief overview of the constraints are given below-

(10) *CCONS: No consonant cluster is allowed on onset positions.
MAX-IO: Input segments must be available in the output segments (no deletion).
DEP-IO: No epenthesis.
CONTIGUITY-IO: Medial epenthesis or deletion of a certain segment is not allowed.
SYLLABLE CONTACT: Rise of sonority disallowed on a syllable boundary

Another crucial factor influencing the output of any optimality theoretic approach is the ranking of the constraints. Ranking a less marked value or constraint in a higher position means it can eliminate any candidate unfamiliar with its structure, thus leading to optimality of an unfamiliar form in the language; and finally the outcome being a wronged one. Thus before deciding any crucial ranking of the optimality theoretic approach, it's quite necessary for a researcher to have a broader idea on the language itself. For the current approach, the ranking by Karim (2010) would be adapted here as earlier explained. This would provide us with a chance to check if the surveyed data either conforms to the previous standard set for the underlying grammar of the Bengali language or requires a new one. The ranking between them would be the following-

(11) *CCONS >>SYLLABLE CONTACT, MAX-IO>> CONTIG-IO>>DEP-IO.

The constraints and the hierarchy are also kept the same [with Karim (2010)], however, the evaluation process would be different as the data is different in this process. The ranking starts with the *CCONS (prohibition of the consonant cluster) which ranks over SYLLABLE CONTACT (Rise of sonority disallowed on a syllable boundary). After that, MAX-IO (no deletion) places in the hierarchy over CONTIG-IO (no medial epenthesis or epenthesis in a certain segment) and CONTIG-IO must dominate over DEP-IO.

Input: /sri/	*CCONS	SYLLABE CONTACT	MAX-IO	CONTIG-IO	DEP-IO
a) sri	*!				
☞ b) siri				*	*
c) si			*!		
d) isri		*!			

Table 5: Tableau A: Epenthesis in a word of [sibilant + rhotic] cluster in Narsingdi dialect.

In the Tableau A, the input form is the /sri/, and here the liquid is preceded by an unaspirated sibilant sound /s/; and the first candidate (a) is the same realization as the input to the Tableau. However, the first candidate gets serious violations for constraint *CCONS, as the [s] cluster following a liquid exists (sibilant and liquid sound together). The second candidate (b) is okay with the first three constraints, however it gets marked for the constraints CONTIG-IO and DEP-IO. However, the fatal violations marks would not be given here as they are relatively in a lower position. The candidate (c) gets fatal violation in the MAX-IO as it has lost a consonant in its second position in the syllable and it is also off the race of winning as a candidate. The last candidate (d) has an initial epenthesis before the consonant cluster, but due to the SYLLABLE CONTACT constraint it gets violated with a major violation, as /is.ri/, here the /r/ sound comes on the syllable boundary and before it comes the /s/ sound, thus here we can observe a rise in the sonority (sonority: rhotic> sibilant). Amongst all of these only the candidate (b) survives with the least serious violations and is held as the winner.

Next, we move to the example of the other word /klanto/, where a stop /k/ is followed by a liquid sound, /l/ and the cluster [kl-] comes as an initial cluster in the syllable. The following is the Tableau for the word-

Input: /klanto/	*CCONS	SYLLABLE CONTACT	MAX-IO	CONTIG-IO	DEP-IO
a) klanto	*!				
☞ b) kelanto				*	*
c) kanto			*!		
d) eklanto		*!			

Table 6: Tableau B: Epenthesis in a word of [stop+liquid]-cluster in Madaripur dialect.

In the Tableau B, the candidate (a) is just like the standard form of the word, however it has got the major violation in consonant cluster for having /k/, /l/ sound together [stop+liquid cluster]. The second candidate (b) like the previous case has got violations in CONTIG-IO and DEP-IO because of the epenthesis of the sound /e/ between /k/, /l/. However, here the serious violations mark (!) would not be inserted as they are relatively lowered ranked constraints, and there are also remaining candidates left over. The candidate (c) drops off the sound /l/ and gets major violations as MAX-IO is higher ranked than remaining others. Lastly, the candidate (d) violates the SYLLABLE CONTACT constraint for the violation of having rising sonorant liquid /r/ sound after the less sonorant stop /k/. Finally, the candidate (b) wins without any fatal violations in any of the constraints, actually for being faithful to the higher ranked constraints.

4.3.2 *Alternative analysis to the Dialect Data in Bengali [Adapted from Karim (2010)]* Firstly, representing the data is necessary (the word- /piriṯi/) which are going to be analyzed for an 'alternative analysis' similar to Karim (2010) in the current approach. The data comes from the 'Puran (Old) Dhaka Dialect (local) from the Dhaka City under the Dhaka Division in Bangladesh. (in the current case, /piriṯi/- in some dialects can mean the psychological attachment and relationship between an unmarried male and female, which must be clarified).

The word /piriti/ from the Old Dhaka Dialect (available in data) actually means love or affection in the Standard Bengali. This word is a native Bengali word and its standard form is /priti/ with the initial consonant cluster, with the exact same meaning. However, this word /pri ṯi/ is not loan, borrowed, technical terms or partial translations, rather a word which has its origin in Bengali (as similar to previous data); and thus it is a very similar example (of its kind) of epenthesis in the dialects of Bengali. This word gets epenthesized in the dialect of Dhaka with the insertion of the vowel /i/ after the initial stop /p/, in the second position of the consonant cluster, which occurs due to literally breaking the consonant cluster with a vowel, making it easier for the speakers. It is to be noted that also there is a rising sonority cluster found; stop /p/ followed by a rhotic sound /r/, and similar data are also found in different other words which go through the epenthesis process and have a very similar structure as the following-

(12) Examples of Bangla Epenthesis with different [stops+ rhotic] clusters found across dialects

Main Word	After epenthesis	Meaning
[p- clusters]		
a) priṯi	piriṯi	love/affection
b) prapok	parapok	receiver
c) prerok	pererok	sender
d) prosṯuṯ	pɔrosṯuṯ	be ready
e) pranṯo	peranṯo	margin/horizon
[t- clusters]		
a) ṯriʃ	ṯiriʃ	thirty
[g- clusters]		
a) grahok	gerahok	retainee/consumer

b) graʃ geraʃ devour/destruct
c) grazzo gerazzo to care about

And, it has been already mentioned earlier that in Bengali syllables, certain consonant clusters are not allowed (at the word initial positions), as this is a marked feature (in majority of the cases). That is why epenthesis takes place for replacing the forbidden structure of the language. For the same reason, in the syllable of the word /priti/, changes take place with epenthesis in the following way-

(13) pri. t̪i. > pi.ri. t̪i.
CCV.CV > CV.CV.CV

In the alternative analysis, there were no more than six different constraints (majority brought earlier) to account for the OT analysis (in Karim, 2010) for the epenthesis in Bengali loan words; similarly in the present approach I would be again applying the same scheme to the surveyed data of the dialects' words (rather than loan words). The constraints are as follows-

(14) *OO: Prohibition of two adjacent obstruents inside a word.
*OR: Prohibition of obstruents followed by resonants.
CONTIG-IO: Medial epenthesis or deletion of a certain segment is not allowed.
*CCONS: No consonant cluster is allowed on onset positions.
MAX-IO: Input segments must be available in the output segments (no deletion).
DEP-IO: No epenthesis.

The constraints ranking was consulted in that study by another senior linguist-instructor, Dr. Marion Caldecott [see Karim (2010) for more]. The ranking would be as follows-

(15) *CCONS, *OR, MAX-IO>> CONTIG-IO>>*OO>>DEP-IO

It is the same ranking with the same hierarchy, but the evaluation would determine whether the chosen data from the survey of the dialects words fits in the scheme or not. The ranking of *CCONS (prohibition of the consonant cluster) literally dominates over *OR (prohibition of resonants followed by obstruents), and all others as this is a marked structure in the Bangla language. Then in the order comes the constraint MAX-IO (no deletion) which dominates over CONTIG-IO (no medial epenthesis or epenthesis in a certain segment). At last the prohibition of two obstruents (*OO) dominates over simple epenthesis (DEP-IO). The winning candidate would have the least serious violations in the evaluation process. Every candidate fatally violating the higher ranked candidates would be near to the losing candidates, with each fatal violation the candidate would be eliminated from the race of winning or being the optimal candidate.

Input:/priti/	*CCONS	*OR	MAX-IO	CONTIG-IO	*OO	DEP-IO
a. priti	*!	*				
☞ b. piriti				*		*
c. piti			*!			
d. ipriti		*!				*

Table 7: Tableau C: Epenthesis in a word of [stop+ rhotic] cluster in Old Dhaka Dialect.

In the Tableau C, firstly the candidate (a) violates the very first constraint due to the consonant cluster in its first syllable and it is a serious violation due to its highest ranking position. The candidate (b) gets no violations in the first three constraints, but later gets two violations in CONTIG-IO and DEP-IO for the epenthesis and breaking the consonant cluster; then candidate (c) drops a consonant in its syllable and gets serious violation for the MAX-IO. Candidate (d) gets serious violation in the higher ranked constraint (*OR) for the resonant /r/ comes after the obstruent /p/. Thus the winning candidate with the least serious violations is the candidate (b), as amongst all the candidates, only (b) has got two violations in the lower ranked constraints, CONTIG-IO and in the DEP-IO, but it has no other violations for the higher ranked constraint and completely faithful to them. All the other candidates having serious violations in the higher ranked constraints thus lose to the candidate (b); and the candidate (b) becomes the winner.

5 Conclusion

In the current paper, it has been proposed that a greater part of the dialect words of the Bengali language includes the same epenthesis pattern which was also applied to the loan words (where sounds were inserted) in earlier research studies. No earlier research studies showed that even the changes in the native dialect data (in Bengali) can be interpreted with the same constraints and the same ranking of the constraints of loan words' epenthesis process; giving a chance for explaining the similarity between 'Underlying Grammar' of the 'Standard Bangla' and 'Dialects of Bangla'. The same rules have been applied to the data in pure Bengali dialect words which were applied to the loan words in Bengali. However, this current paper argued against Karim (2010) that the epenthesis takes place only in one place of the clusters (instead of two places), that is in the rising sonority clusters only, which is supported in the data that were found in the survey. Apart from the Optimality Theoretic approach, it has also been found there in the existing data that in the epenthesis process, sometimes the perfect syllable structures are broken for unknown reasons, and also as a marked feature- 'forbidden structures' (consonant clusters) are also broken, and finally, the most occurring epenthesis in the sounds is the /i/ sound inserted in the majority of the cases. In the case of different changes in structures through epenthesis, those were represented in terms of metathesis, and there were found partial reduplication only in the case of the consonant insertion. Also, the deletion process is found vastly in different dialect words (deletion with different processes for the same words are also found); other changes and epenthesis of the vowels has been explained with diphthongization (for vowels). Consonantal epenthesis is very rare, and only found some cases of them.

References

Chung, Chin-Wan. 2019. An Alternative Account of English Consonant Cluster Adaptations in Bengali Dialects. 언어학, *27*(3). 99–123.

Clements, George N. 2016. Syllabification and epenthesis in the Barra dialect of Gaelic. In *The phonological representation of suprasegmentals,* 317–336. Berlin, Boston: De Gruyter Mouton.

Goldstein, David. 2013. Diphthongization. In G. K. Giannakis (Ed.), *Encyclopedia of Ancient Greek Language and Linguistics*. Brill. https://doi.org/10.1163/2214-448X_eagll_SIM_00000447

Golston, Chris & Wiese, Richard. 1996. Zero morphology and constraint interaction: subtraction and epenthesis in German dialects. In *Yearbook of Morphology 1995*, 143–159. New York City, NY: Springer.

Gouskova, Maria. 2004. Relational hierarchies in Optimality Theory: The case of syllable contact. *Phonology* 21(2). 201–250

Hall, Nancy. 2013. Acoustic differences between lexical and epenthetic vowels in Lebanese Arabic. *Journal of Phonetics* 41(2). 133–143.

Kager, René. 1999. *Optimality theory*. Cambridge: Cambridge University Press.

Kar, Somdev. 2009. *The syllable structure of Bangla in Optimality Theory and its application to the analysis of verbal inflectional paradigms in distributed morphology.* Tübingen: University of Tübingen dissertation

Karim, Khaled. 2010. Vowel epenthesis in Bangla: An Optimality Theory analysis. *Working Papers of the Linguistics Circle* 20(1). 26–36.

Karim, Khaled. 2011. An Optimality Theoretic (OT) account of word-final vowel epenthesis and deletion processes in the incorporation of loanwords into the Dhaka dialect of Bangla. *Working Papers of the Linguistics Circle* 21(1). 23–33.

Lombardi, Linda. 2003. Markedness and the typology of epenthetic vowels. *Linguistics and Phonetics 2002*.

Ohala, Manjari & Ohala, John J. 1991. Nasal epenthesis in Hindi. *Phonetica* 48(2–4). 207–220.

Prince, Alan & Smolensky, Paul. 2004. *Optimality Theory: Constraint interaction in generative grammar*. Hoboken, NJ: John Wiley & Sons.