Educational Administration: Theory and Practice
2024,30(2), 1399 - 1405
ISSN:2148-2403
https://kuey.net/

Research Article

Nasal Counterparts Of Bengali Vowels: A Corpus Study

Sumayah Sharmin[1*]

[1*]PhD Fellow; English Phonetics and Phonology; Kangwon National University; South KoreaMLecturer, Department of English; City University, Bangladesh sharmin.knu21@gmail.com

Citation: Sumayah Sharmin , (2024), Nasal Counterparts Of Bengali Vowels: A Corpus Study *Educational Administration: Theory and Practice*, *30*(2), 1399 - 1405
Doi: 10.53555/kuey.v30i2.7239

ARTICLE INFO

ABSTRACT

This study delves into the nasal vowels of Bangla (also known as Bengali) with the primary objective of discerning their phonemic status. While it has long been assumed that each of the seven monophthongal oral vowels in Bangla possesses a phonetically contrastive nasal counterpart, a comprehensive examination of this subject has been conspicuously absent from the existing literature. Employing a phoneme dictionary generated from a corpus comprising 15 million-word tokens and encompassing approximately 300 thousand-word types, this research endeavors to determine whether all oral vowels indeed exhibit phonemically contrastive nasal vowel counterparts. The findings of this investigation suggest that only five out of the seven monophthongs manifest phonetically contrastive relationships with their nasal counterparts, thereby revealing the absence of this link between nasality and the vowels /ɔ/ and /æ/.

Key Words: Nasalization, Bengali vowels, Bengali phonology, Phonemic analysis, Corpus study, Nasal vowels

1. Introduction

This study delves into the nasal vowels of Bangla (also known as Bengali) with the primary objective of discerning their phonemic status. While it has long been assumed that each of the seven monophthongal oral vowels in Bangla possesses a phonetically contrastive nasal counterpart, a comprehensive examination of this subject has been conspicuously absent from the existing literature. Employing a phoneme dictionary generated from a corpus comprising 15 million-word tokens and encompassing approximately 300 thousand-word types, this research endeavors to determine whether all oral vowels indeed exhibit phonemically contrastive nasal vowel counterparts. The findings of this investigation suggest that only five out of the seven monophthongs manifest phonetically contrastive relationships with their nasal counterparts, thereby revealing the absence of this link between nasality and the vowels /ɔ/ and /æ/.

Key Words: Nasalization, Bengali vowels, Bengali phonology, Phonemic analysis, Corpus study, Nasal vowels
Many studies show that Bangla contains a seven-vowel system and that the nasality of those vowels adds another set of phonetically contrastive vowels (Morshed, 1972; Alam, Habib, and Khan, 2008; Thompson, 2012). As a result, the seven monophthong vowels /i, e, a, o, u/ are said to contrast with their nasal counterparts /ĩ, ẽ, æ̃ , ã, ɔ̃, õ, ũ/. However, all previous explanations of vowel nasality in Bangla were based entirely on subjective judgment, and the claim was not directly and properly addressed with sufficient factual data in the previous literature. This study intends to examine the phonemic status of the nasal vowels in Bangla to understand the significance of nasality in phonemic vowel differences.

1.1 Vowel System of Bengali

Bangla is a seven-vowel symmetrical language. Morshed (1972) has listed the vowels. There are two high vowels, two high-mid vowels, two low-mid vowels, and one low vowel in /i, u, e, o, a/ (Figure 1). In terms of backness, there are distinctions between frontness and backness. Backness contrasts, except for the low one.

	Front	Central	Back
High	i		U

High-mid	e		O
Low-mid	æ		ɔ
Low		a	

Figure 1: Bengali Vowels (Morshed, 1972, p.24)

Shamim (2011) investigated vowel contrasts in terms of phonological properties and discovered that the number of vowels was the same, but with a little variance. Morshed (1972) used the sign /ɛ/ to symbolize the vowel /æ/ in his book, referring to it as a "non-low" [-low] vowel (the /æ/ vowel has frequently been referred to as [+low] (Zsiga, 2013: p. 270)). Shamim's recommendation that the difference between /e/ and /ɛ/ be recorded using the [ATR] feature rather than the [low] feature, where /e/ is [+ATR] and /ɛ/ is [-ATR]". The front vowel pair /e/-/ɛ/ and the back vowel pair /o/-/ɔ/ form a symmetric pattern, and the [ATR] feature is employed to achieve both contrasts.

	i	E	ɛ	u	O	ɔ	A
High	+	–	–	+	–	–	–
Low	–	–	–	–	–	–	+
ATR	+	+	–	+	+	–	–
round	–	–	–	+	+	+	–
Back	–	–	–	+	+	+	+

Figure 2: Bangla Vowels and Phonological Features (Shamim, 2011, p.8)

Alam, Habib, and Khan (2008) researched the acoustic features of Bangla vowels and identified the same seven vowels, although Morshed (1972) and Shamim (2011) based their vowel descriptions primarily on native speaker intuition or impressionistic observation. Figure 3 depicts the first two formant frequencies of vowels (F1 on the Y-axis and F2 on the X-axis). The appropriate Bangla vowel grapheme is shown in the figure to the left of the IPA symbols, which reflect the mean F1 and F2 values for the vowel categories. The acoustic space also indicates the Bangla vowel space. The formant frequencies of the nasal vowels are also given in the figure; they appear to share a symmetric vowel space with the oral vowels.

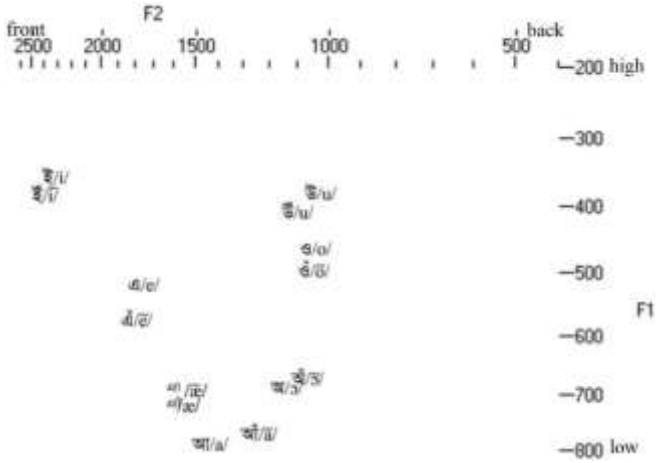

Figure 3: Bangla vowels and acoustic space (with nasals) (Alam et al., 2008, p. 9)

1.2 Bengali Nasal Sounds

Each of the seven oral vowels in Bangla has a phonetically contrastive nasal counterpart, according to previous research. Morshed (1972) defines oral and nasal vowels as two types of vowels in Bangla since they are phonetically separate. As shown in the table below-

Oral vowels	Nasal vowels
/i/	/ĩ/
/e/	/ẽ/
/æ/	/æ̃/

/a/	/ã/
/ɔ/	/ɔ̃/
/o/	/õ/
/u/	/ũ/

Table 1: Oral vs. nasal vowels in SCB (Morshed, 1972)

In the same spirit, Khan (2008) argued that all Bangla oral vowels have nasal equivalents, albeit he suggested that only specific regional dialects would be affected. According to him, Bengali includes seven vowels, including "seven nasal vowels for dialects that have contrastive nasalization" (p. 25).

According to Barman (2011), any [oral] vowel in Bangla is capable of nasalization. As a result, each of Bangla's seven pure vowels has a nasalized counterpart" (p. 21). He presents the following words (Table 2) as examples of vowel nasality in Bangla.

Nasal vowel	**Word**	**Gloss**
/ɑ̃/	/tʃɑ̃ɖ̪/	Moon
/ĩ/	/ĩɖ̪ur/	Rat
/ẽ/	/pẽtʃa/	Owl
/õ/	/dʰõa/	Smoke
/ũ/	/ũtʃu/	High
/ɔ̃/	/pɔ̃tʃa/	Rotten
/æ̃/	/pæ̃tʃ/	Complexity

Note: Barman (2011) used /ɑ/ and /ɒ/ instead of /a/ and /ɔ/, respectively

Table:2 Words with nasal vowels (Barman, 2011, p. 21)

Thompson (2012) presented several minimal pairs (Table 3) to provide a more detailed representation of the scenario. Indeed, descriptions of genuine minimum pairings demonstrate unequivocally that the oral and nasal pairs are phonologically contrastive. Thompson found evidence for two Bangla vowels: /o/ and /a/, but most previous analyses did not include minimum pairings in the scene.

Nasal	Gloss	Oral	Gloss
/bõʈi/	curved knife	/boʈi/	Pill
/gã/	Village	/ga/	body
/kãʈa/	Thorn	/kaʈa/	to cut
/bãɖ̪ʰa/	Bind	/badʰa/	obstruction
/ãʈa/	fix, stitch	/aʈa/	flour
/kʰãɽa/	Sword	/kʰaɽa/	erect
/kãɖ̪a/	Weep	/kaɖ̪a/	clay
/kãtʃa/	unripe, green	/katʃa/	wash

Table 3: Oral-nasal minimal pairs (Thompson, 2012, p. 15)

According to the claims made in previous literature, which were discussed above, the status of Bangla nasal vowels can be classified into two categories. First, as most studies assert, Bangla includes fourteen different, phonologically contrastive monophthongs, in which all nasal vowels and oral vowels are treated as separate phonemes. The problem with this assumption is that no attempt has been made to actually validate it using Bangla data; instead, previous research' claims were exclusively based on impressionistic judgements. Thompson (2012) described only a few minimal pairs based on nasality, which are displayed in Table 3. Even in this description, the only vowels supported by evidence were /o/ and /a/.

The second possibility is that not all seven nasal vowels in Bangla are phonetically contrastive. The nasality of some spoken vowels may be affected by lexical or phonetic situations. Some nasal vowels are phonetically different from their oral counterparts.

2. Method

Finding minimal or nearly minimal pairs based on the target segment is a valid method of determining whether or not a segment is phonemic in a given language. Kennedy (2017) claims that "minimal and near-minimal pairs are convenient tools for us to discover contrastive oppositions" (p. 117). According to Kennedy, using minimal pairings is "a convenient shortcut to identify phonemes within languages," and a minimum pair is "a pair of words that differ at the surface just by a single phoneme" (p. 95).

This study tried to determine whether all nasal vowels in Bangla are contrastive with their oral counterparts using minimum and near-minimal pairings. The study used a corpus of Bangla written text including over 18 million word-tokens with nearly 400 thousand word-types as its data source. For numerous reasons, written text was favored above any vocal data. First, creating a spoken corpus requires significant time and resources, as well as the requisite coding of the relevant parameters. A text corpus is much easier to create and use.

Second, the diversity of lexicon in a speech corpus is typically lesser; it is difficult to ensure all conceivable word-types in speech (since corpus development typically occurs in experimental settings, which do not allow for much flexibility in terms of experiment length). However, accumulating a large text corpus is slightly easier (written texts in many languages are created in great quantities on a daily basis and are frequently freely available).

A text corpus was chosen for this study because Bangla orthography closely matches to the spoken form, which is not the case for many other languages, such as English. The similar approach would not be appropriate in English due to the great lack of correlation between graphemes and phonemes. A phonemic vocabulary, such as the CMU dictionary (CMU, 2018), would be necessary in these cases. Because most Bangla graphemes are related one-to-one with the corresponding phonemes, the usage of a text corpus was regarded appropriate for this study. (Of course, there are still some circumstances in which complex consonants and inherent vowels are exceptions to the one-to-one correspondence in Bangla; Section 3.2 provides more detail on how these challenges were overcome.).

2.1 Corpus

Arafat, Islam, and Khan (2006) built and used the Prothom Alo Corpus for the first time in this study. The corpus was composed of sections from Prothom Alo, a daily Bangla publication widely recognized as Bangladesh's most popular. According to (2006), the Prothom Alo was chosen for corpus development since it was "one with less spelling mistakes and with conventional spelling of Bangla words" (p. 2). The corpus comprised approximately 18 million-word tokens and 400 thousand different word kinds. This study used a subset of the broader corpus, which had approximately 8 million word tokens and 275 thousand word categories.

3. Data Processing

Although most Bangla graphemes consistently translate to corresponding phonemes, there are few deviations that must be considered. This affected both consonants and vowels. For example, the Bangla word " (/bak-ko/ "sentence") features a difficult grapheme sequence in which the letters /k/ and /j/ are merged in "," but the combination is pronounced as [kk] in speech. As a result, the corpus sequence /kj/ had to be modified to /kk/. Furthermore, while vowels do appear in speech, Bangla's orthography occasionally lacks unambiguous vowel graphemes. For example, the word "" (/kɔbor/ "grave") includes only three consonants: /k, b, r/, while the speech form [kɔbor] has two vowels.

Thompson (2012) (p. 24) refers to these as "inherent vowels" because they are always either /o/ or /ɔ/ depending on the phonological context.

Using a set of criteria developed, the exceptional graphemes outlined above were translated into the matching surfacing phonemes. A phoneme dictionary was thus developed utilizing a modified corpus of Bangla words and their phonetic pronunciations.

In Bangla text, nasal vowels are consistently denoted with the diacritical mark "chandara-bindu" (ঁ) above the appropriate segment, and this practice is nearly universal. As a result, all vowels with the sound "chandra-bindu" in the corpus were classified as nasal vowels. For each of the word categories that featured a nasal vowel, the full corpus was searched to discover (and record) any words of the same segments without the nasal marker (essentially, minimal pairs). This technique was repeated for the entirety of the words in each vowel category. If no minimal pairs were found for a specific vowel category, additional research was conducted by extracting the settings where they did occur in order to locate and investigate near-minimal couples.

4. Results

4.1 Vowel /o/- 'ও'

The corpus contained 62 word types with nasal consonants, and there were instances of true minimal pairs. As shown in Table 4, a difference in nasality between word pairs like /khoda/- God and /khõda/ is all that is needed to achieve a contrast in meaning. This is a blatant demonstration that the nasal vowel is phonemically distinct from the oral vowel.

However, a few situations presented a more complicated situation. If the meaning of /tʃʰõɽa/ is "lad/boy," the word /tʃʰoɽa/ "to throw" can form a minimal pair with /tha/; however, the same word can also be pronounced with the oral vowel (/tʃʰoɽa/) and still mean "lad/boy" (Huq, Lahiri, and Sarker, 2000, p. 446). As a result, /õ/ vs. /o/ is contrastive. In these situations, /o/ depends on the context. /kʰõta-kʰota/, "to mention someone's negative points," /khõpa-khopa/, "hair bun, /põt̪a-pota/, "to plant/bury something in the ground," /phõɽa-phoɽa/ etc. are examples of phrases that are similar where the differences in meaning caused by phonetic variations were not influenced by nasality.

Nasalized		**Non-nasalized**	
খোঁজা /khõdʒa/	to search	খোজা /kodʒa/	castrated
ফোঁটা /phõta/	droplet	ফোটা /pʰota/	To bloom
ধোঁয়া /dhõwa/	smoke	ধোয়া - /dhowa/	To wash

4.2 Vowel /u/- 'উ'

Among the 827 word types that had the nasal vowel //, only 4 were found to belong to minimal pairs with contrast /ũ/-/u/. The list is shown in Table 5, and it clearly demonstrates that in Bangla, the vowel /u/ is phonemically contrastive with //, as lexical differences can be explained by differences in nasality alone.

Nasalized		**Non-nasalized**	
কুঁড়ি /kũri/	bud	কুড়ি- /kuri/	twenty
কুঁড়া /kũra/	husk	কুড়া- /kura/	to collect
খুঁটি /kʰ ũti/	piller	খুটি /kʰuti/	to pick something

4.3 Vowel /i/- 'ই'

The corpus contained 196 word types with the nasal sound /ĩ/, but interestingly, none of these word types had a minimally contrastive counterpart for nasality. There were orthographic minimal pairs like like /tʃĩɽa/ vs. /tʃiɽa/ in the corpus. /tʃiɽa/ which means "flattened rice," but these were just different lexical forms with the same meaning. As a result, it was necessary to search for near-minimal pairs in the absence of true minimal pairs.

The near-minimal pairs for the /ĩ/-/i/ contrast in the corpus are shown in Table 7 as a subset. Table 7 shows that because the pairs differ by more than one segment, they are not quite minimal pairs. However, the environments in which the two vowels (nasal vs. identical within pairs of oral) occur. The positions of occurrence of the nasal and oral vowels are unpredictable, for instance, in the words /pĩpɽa/ "ant" and /pipaʃa/ "thirst," where both /ĩ/ and /i/ occur in the same phonological environment [p p]. This demonstrates that these two vowels are distributed contrastively.

Nasalized		**Non-nasalized**	
সিঁদুর /ʃĩdur/	vermillion	বিধুর /bidur/	widower
বিঁধা /bĩdha/	to drill	বিধান /bidʰan/	rules
খিঁচ /khĩtʃ/	to pull	খিচুড়ি /kʰĩtʃuri/	mixed rice

4.4 Vowel /e/- 'এ'

Among the 478 word types in the corpus, just four were found with minimal pairs of nasal vowels /ẽ/ (Table 8). Every other word that contained a nasal vowel, /ẽ/, either had its phonetic equivalent or was simply naturally nasal. However, Table 7's minimal pairs show that nasality is still contrastive for the vowel /e/.

Nasalized		**Non-nasalized**	
বেঁচে /bẽtʃe/	to live	বেচা /betʃa/	to sell

গেঁয়ে /gẽje/	rural	গেয়ে /geje/	sing
ছেঁড়া - /chẽɾa/	torn	ছেড়ে /chere/	without

4.5 Vowel /a/- 'আ'

Nasality was most common for the vowel /a/, which appears in 2555 different word categories. This group might yield approximately 120 minimum pairs (a few examples are shown in Table 9). As seen in Table 9, the nasal vowel /ã/ clearly produces contrastive meaning from the oral vowel /a/ forming minimal pairs, indicating that /a/ and /ã/ are used to construct phonemic contrastiveness.

Nasalized		**Non-nasalized**	
কাঁটা /kãta/	thorn	কাটা /kata/	to cut
বাঁধা /bãdha/	to tie	বাধা /badha/	to tie
কাঁদা /kãda/	to cry	কাদা /kada/	mud

4.5 Vowel /ɔ/- 'অ'

There were only 22 word types featuring the nasal vowel // in the total corpus. Surprisingly, none of these words had a pair with a minimal or virtually minor nasal-oral difference. In truth, several of the nouns with the sound /ɔ/ were French names, such as /ɔ̃ri/ (Auri) and /mɔ̃lier/ (Moliere), which are usually considered to have nasal vowels in the original language. This demonstrates that these nouns have a lexically inherent nasal vowel, /ɔ/.

The other words such as পঁচাশী-/pɔ̃tʃaʃi/- Eighty-five and পঁচা- /pɔ̃tʃa/- Rotten have nasal vowels, the nasalization in /ɔ̃/ is not contrastive with the oral equivalent. In other words, /pɔtʃaʃi/ is likely to be created and understood in the same way as /pɔ̃tʃaʃi/. The vowels do not have to be nasal all the time, providing the oral vowel complete freedom to be nasal or not. This implies that the nasal and oral vowels are merely in free variation.

4.6 Vowel /æ/- 'এ্যা'

There was no minimal or nearly minimal pair for the vowel /æ/ in the corpus. The nasal vowel (/æ̃/) was only employed in three-word types: /pæ̃ tʃa/ "owl," /pæ̃ tʃar/ "of owl," and /pæ̃ tʃano/ "to twist" (the first two are from the same morpheme paradigm). This was the least common vowel in the sample. Thus, the sole context in which the /æ̃/ vowel appeared was [p tʃ], but no words with the oral /æ/ emerged in the same context were detected. There were no minimal or near-minimal pairs found to demonstrate that /æ/ and /æ̃/ are distributed contrastively in Bangla.

5. Analysis

This analysis presents findings related to nasality in Bangla, focusing on the phonemic contrast of nasal vowels. Let's break down the key points:

1. Nasality as Phonemically Contrastive for Some Oral Vowels:
   - The study indicates that nasality in Bangla is phonemically contrastive, but this contrast is not uniform across all seven oral vowels.
   - It suggests that some oral vowels exhibit phonemic contrast with their nasal counterparts.
2. Phonetic Contrast for Only Five of the Seven Oral Vowels:
   - Out of the seven oral vowels in Bangla (/i, e, a, o, u/), only five have nasal counterparts that show phonetic contrast.
   - This implies that for certain oral vowels, there is a distinct nasal counterpart that can be phonetically differentiated.
3. Lack of Minimal Pairs for /æ/ and /ɔ/:
   - Despite the assertion that only five oral vowels have phonetically contrastive nasal counterparts, the study found no evidence, in the form of minimal or nearly minimal pairs, to support the claim that /æ/ and /ɔ/ lack phonemic contrast with their nasal equivalents.
   - This suggests a potential complexity or exception in the phonemic contrast of nasal vowels for these specific oral vowels.
4. Contrastive Nasal Equivalents for Five of Seven Monophthongs:
   - The study reveals that only five of the seven Bangla monophthongs have contrastive nasal vowel equivalents. This reinforces the idea that not all oral vowels exhibit phonemic contrast in terms of nasality.
5. Lack of Nasal Contrast for /æ/ and /ɔ/ in Bangla:
   - Nasality is highlighted as not being a phonemically contrastive trait for two unspecified Bangla vowels represented by /æ/ and /ɔ/

- This indicates that nasality may not play a distinctive role in differentiating these particular vowel sounds in the language.

6. Chandra Bindu Diacritic Indicating Nasal Vowels:
   - Vowels marked with the diacritic "Chandra Bindu" (ঁ) are identified as always nasal vowels.
   - Importantly, the assertion is made that vowels without this diacritic are also nasal vowels. This provides a clear marker for identifying nasal vowels in the absence of the diacritic.

In summary, this analysis sheds light on the nuanced nature of nasality in Bangla, highlighting phonemic contrasts for certain oral vowels, the absence of evidence for some, and the role of the Chandra Bindu diacritic in indicating nasal vowels. The findings contribute to a more comprehensive understanding of the phonological features of Bangla.

6. Conclusion

This study concludes that contrary to what has been repeatedly and commonly maintained in the current literature, nasality is only phonemically contrastive for a subset of Bangla's seven oral vowels. According to evidence from minimal and near-minimal pairs from a Bangla corpus, only five of the seven oral vowels (/i, e, a, o, u/) have phonemically contrastive nasal counterparts. It is maintained, however, that // and // are not phonemically contrastive with their nasal counterparts /ɔ/ and /æ/ since the study was unable to find evidence in the form of minimum or virtually minimal pairings to support the allegation. As a consequence, only five of the seven Bangla monophthongs have contrastive nasal vowel equivalents, supporting the study's conclusion that nasality is not a phonemically contrastive trait for /ɔ/ and /æ/ in Bangla.

As Khan (2008) implies, the vowels involved in nasal contrastive nature may alter depending on the Bangla dialect. This study focused on the Standard Colloquial Bangla spoken in Bangladesh; however, information from other dialects may assist create a more complete picture of the vowel nasality issue.

The findings of the study, which are consistent with Sarkar's (2004) analysis of Bangla vowel frequency, reveal an intriguing tendency in which nasal vowels are substantially less frequent than oral vowels. Furthermore, because many nasal vowels were simply phonetic variations of oral vowels, they did not affect lexical meaning. Sociolinguistic factors could still be impacting the variances. Furthermore, it could be a symptom of diachronic shifts in Bangla, where nasality differences are decreasing; further research should look into these possibilities.

References

1. Alam, F., Habib, S. M., & Khan, M. (2008). Acoustic analysis of Bangla vowel inventory. Tech. rep. Center for Research on Bangla Language Processing; BRAC University. Retrieved on May 20, 2018, from http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.173.651&rep=rep1&type=pdf
2. Arafat, Y., Islam, M. Z., & Khan, M. (2006). Analysis and Observations from a Bangla news corpus. Proc. of 9th International Conference on Computer and Information Technology (ICCIT 2006), Dhaka, Bangladesh, December 2006.
3. Barman, B. (2011). A contrastive analysis of English and Bangla phonemics. Dhaka University Journal of Linguistics, 2(4), 19-42.
4. Basu, J., Basu, T., Mitra, M., & Mandal, S. K. D. (2009). Grapheme to phoneme (g2p) conversionfor Bangla. In Speech database and assessments, 2009 Oriental COCOSDA International Conference, 66-71. IEEE.
5. CMU Dict. (2018). The CMU pronouncing dictionary. Retrieved on June 10, 2018 from http://www.speech.cs.cmu.edu/cgi-bin/cmudict?in=C+M+U+Dictionary.
6. Huq, D. (2002). Bhasha Bigganer Katha [Facts about Linguistics]. Dhaka: Mowla Brothers.
7. Huq, M. E., Lahiri, S., & Sarker, S. (2000). Bangla Academy Byabaharik Bangla Abhidhan [BanglaAcademy Functional Bengali Dictionary]. Dhaka: Bangla Academy.
8. Kennedy, R. (2017). Phonology: A coursebook. Cambridge, UK: Cambridge University Press.
9. Khan, S. D. (2008). Intonational phonology and focus prosody of Bengali. UCLA Dissertation. Proquest UMI Dissertation Publishing.
10. Morshed, A. K. M. (1972). The phonological, morphological and syntactical patterns of standard colloquial Bengali and the Noakhali dialect. University of British Columbia MA thesis.
11. R Core Team. (2017). R: A language and environment for statistical computing. R Foundation for Statistical Computing Vienna, Austria. https://www.R-project.org/.
12. Sarkar, P. (2004). Segmental phonology of standard colloquial Bengali. University of Chicago, Department of Linguistics dissertation.
13. Shamim, A. (2011). A reanalysis of Bengali vowel assimilation with special attention tometaphony. The City University of New York, MA thesis.
14. Thompson, H. (2012). Bengali. Amsterdam, Philadelphia: John Benjamins Publishing.