A CONTRASTIVE ANALYSIS OF ENGLISH AND BENGALI CONSONANTS

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ABSTRACT

This paper is an analysis of similarities and differences between English and Bengali consonant phonemes. The reason why a study of contrast has been undertaken are these majors tenets of the CAH (Contrastive Analysis Hypothesis) to which the author subscribes: 1) Errors are mainly L1 induced, 2) the more different the two languages are, the more difficult or erroneous the acquisition of the TL is, 3) the study of contrasts helps both the teacher and the learners predict learning difficulties and, helps the teacher design appropriate remedial and corrective materials and tasks, 4) CA can be applied to any aspect of language, i.e., phonology, syntax, or pragmatics, 5) the study of phonological contrasts between two languages work out the best, and 6) L1 phonological negative transfer is more pronounced than the transfer of any other aspects of language. Based on the above assumptions about contrastive analysis of languages, English and Bengali consonant phonemes are analyzed in detail in this paper in terms of the features of articulation, namely place or articulation, manner of articulation, voicing and, also, aspiration because it is a distinctive feature of some Bengali consonants which are likely to interfere with the acquisition of their counterparts in English. After a detailed analysis of the differences and a very few similarities that exist between the two consonant systems, an inventory of the difficult English consonants is made according to the respective severity of difficulty the consonants pose. Lastly, it is recommended that along with the segmental features of L2 pronunciation, its supra-segmental features are also to be taken care of and that an integrated approach is adopted to the teaching of L2 pronunciation.

Key words: CAH, L1, TL, Transfer, Features of articulation

Introduction

This paper is about the contrasts between English and Bengali consonant phonemes which constitute the lowest meaningful unit of phonology of language. Before the contrasts are made, it is necessary to understand why CA (Contrastive Analysis) should be important. According to the CAH (contrastive analysis hypothesis), the study of differences between specific aspects of a learner's L1 and those of the TL (target language or L2) would help both the teacher and the learner predict learning difficulties and errors in acquiring the target language and would assist and direct the materials writer in designing effective teaching materials.

First developed by Fries (1945, p.9), the CAH claims that the most effective teaching materials are those based on the scientific description of the language to be learned and by carefully comparing it with a parallel description of the native language of the learner. Later, Lado (1957: vii) strongly claimed that the L2 learning difficulties can be predicted by systematically comparing and contrasting the language and culture of the TL with those of the L1. A similarly strong claim was made by Banathy, Trager and Waddle (1966, p. 37): "The changes that take place in the language behavior of the foreign language student can be equated with the differences between the structure of the student's native language and culture and that of the target language and culture." In essence, the acquisition of a L2 is dependent on the L1 linguistic form and culture. Later, Wilkins (1972, pp. 197 – 198) expressed a similar opinion that bigger the difference in two language forms, i.e., the L1 and the TL, the more difficult the acquisition of the TL form is likely to be.

Anderson (1998) supports this by saying that similarities between the target language and the L1 stimulate acquisition but differences restraint it. Larsen-Freeman (1991, p. 53) holds a similar view that where the two languages are similar, positive transfer in terms of L2 acquisition would occur whereas negative transfer or interference would occur where the two language forms vary.

Regarding the proposition that contrastive analysis is effective in the teaching of a L2, Chan (2004) has the view that the study of differences between L1 and L2 forms may help syllabus designers and curriculum writers to anticipate learning problems and subsequently focus on remedial efforts and try out error-correction activities and consolidating exercises. Chan found that understanding differences between language forms may help syllabus designers and curriculum planners to focus their remedial efforts and error correction activities by anticipating learning problems revealed through differences discovered by demonstration and metalinguistic clarifications and any other form-focused activities.

Some, however, do not subscribe to the view that contrastive analysis is beneficial to the teaching and learning of a L2. They raise the following issues:

1. All languages have common deep structures (meaning), so superficial differences between languages are insignificant.

2. CA puts emphasis on inter-language errors only.

3. CA cannot predict strategies learners are likely to employ to reduce error.

4. Analysis of contrasts is effective if errors are regular and systematic.

5. Some errors predicted may not be confirmed by actual performance.

6. Learners are not presented with the whole system of the TL.

7. CA can be used in a homogenous classroom or learning environment.

8. Sufficient knowledge of both the languages (the L1 and the TL) is required for a description of contrasts.

The following answers to these criticisms would seem appropriate:

1. Form is the basis for meaning or deep structure. A wrong form may signal a wrong meaning. With regard to pronunciation, the wrong phonological representation of a word resulting in wrong articulation of the word may create comprehension difficulty to a listener.

2. There is no denying that errors occur not only because of inter-lingual influence, but the focus of this paper is L1 interference in the acquisition of pronunciation which has enough evidence of being mainly influenced the L1.

3. Use of learner strategies should follow the identification of the problematic forms first.

4. In the author's context, the learners' pronunciation errors are indeed regular and systematic. The fact is pronunciation habits of a particular speech community, except for a few variations within the group, are regular and systematic.

5. Not all predictions, in any case, are always true. In actual performance, therefore, there might be some deviations which may need further investigation as to their source or sources.

6. An analysis of the whole language system is neither possible nor is it necessary. An investigation of a particular language feature for a given purpose should suffice.

7. Not having sufficient knowledge of the language systems cannot be an excuse for not undertaking a study of contrasts.

Contrastive analysis is a systematic procedure. Whitman (1970) suggests the following steps:

Step one: A description of the languages in question take place place.

Step two: A selection of linguistic items to be contrasted is made.

Step three: The contrasts are investigated - one linguistic system is mapped onto another.

Step four: Difficulty levels of the selected items are hierarchically arranged.

Step five: The predictions are tested.

(Based on Whitman, 1970, pp. 191 – 197; and Gas and Selinker, 1994, p. 60)

In the light of the above discussion, the major assumptions about the Contrastive Analysis Hypothesis or CAH may be summarized as follows:

1. The major source of comprehension and production errors is L1.

2. Similarities facilitate learning while differences restrain it. In other words, an awareness of the differences between what is being learnt what is in the mother tongue minimizes interference from the latter and thus enhances acquisition.

3. Contrastive analysis helps learners predict learning difficulty which helps the teacher design appropriate teaching materials, methods and techniques.

4. Effective teaching materials are those based on the study of similarities and differences between the two languages concerned.

5. Highlighting contrasts while making instructional intervention may help learners notice errors that they have produced and self-correct themselves.

6. The greater the difference, the more difficult the acquisition of the L2 is likely to be.

7. Such an analysis applies to all aspects of language, i.e., phonology, morphology, syntax, semantics and pragmatics. However, phonological analysis of contrasts is believed to work out the best because. as Ellis (1994, p.316) claims:

8. "There is widespread recognition that transfer is more pronounced at the level of the sound system than at the level of syntax." (Ellis, 1994, p. 316)

The following study reports confirm the prevalence of L1 phonological transfer to the acquisition of L2 consonants.

Rahimpour and Dovaisa (2011) carried out this study prior to preparing materials for teaching English pronunciation to Kurdish students. The 44 English phonemes were compared with the 38 Kurdish phonemes. Some of the data collected from the learners' pronunciation of English contained the following deviations:

1. All English unaspirated voiceless stops were aspirated.
2. / k /, / g / and / t / were palatalized.
3. / v / was substituted by / w /.
4. / r / was pronounced as / ɽ /, a flap.
5. / θ / was substituted by / s / or / t /.

All of the above deviations were attributed to the negative influence of Kurdish which is phonologically different from English, the TL.

Next, Joshi (2014) conducted an investigation into the differences in segmental phonology (phonemes) of Standard English (RP) and GIE (General Indian English) with special reference to Gujrati English with a view to devising pedagogical strategies to resolve pronunciation problems of his learners. Given below are some of the deviations he found in the learners' English pronunciation:

1. / z / was pronounced as / ʤ /
2. / f / was pronounced as / fʰ /
3. / r / was pronounced as / ɽ / or a tap
4. / p / and / l / were doubled
5. / g / was pronounced as / gʰ /

The researcher concluded that differences in the phonological systems between the two languages in question were to blame for the errors which are likely to cause unintelligibility.

In yet another study the same year (2014), Fan and Yongbing conducted an experiment to address the issue of L1 negative phonological influence on L2 word identification and production. In this study, 30 intermediate Chinese English learners were asked to read words containing the English consonant sounds / θ / and / ð /. The subjects assimilated / θ / and / ð / into / s / and / d / respectively. The reason, as the researcher pointed out, was the absence of these sounds in Chinese, so they replaced them with the sounds available in their L1 (/ s / and / d /) respectively. This is a phenomenon of a Single Category Pattern (Major, 2008) of the mapping of two similar L2 sounds onto one nearly equivalent L1 sound. The result confirms that difference in form between the phonological systems of two languages, or when the L2 form is unavailable in the L1, influence occurs from it as negative transfer indicating difficulty.

One more study report should suffice to establish the prevalence of phonological negative transfer. This case was different from the earlier three in that the opposite was the case – English speakers were learning Arabic. The objective of the research was to find out to what extent the CAH would help teachers and American English speaking students of Arabic predict pronunciation errors occurring in the classroom. The subjects were three adult English speakers. The researcher (Huthaily, 2003) sat in the classroom and made notes of the phonological mistakes the students made. The following were the few found among others:

1. / tʰ / was used instead of / t̪ / (ت)
2. / k /(ق) was aspirated as / kʰ /
3. / d̪ / (د) was pronounced as / d /
4. / r / (ر), a trill, was pronounced as / ɹ / an English approximant

The researcher has the opinion that deviant pronunciation occurred because of the learners' L1 (English) which had a powerful influence on the acquisition of Arabic. He also claims that to teach pronunciation, being a native speaker alone is not enough; the teacher must have the phonological knowledge of both the L1 and the L2. The researcher, in a way, subscribes to the CAH which recommends language awareness through an analysis of similarities and differences between the L1 and the TL.

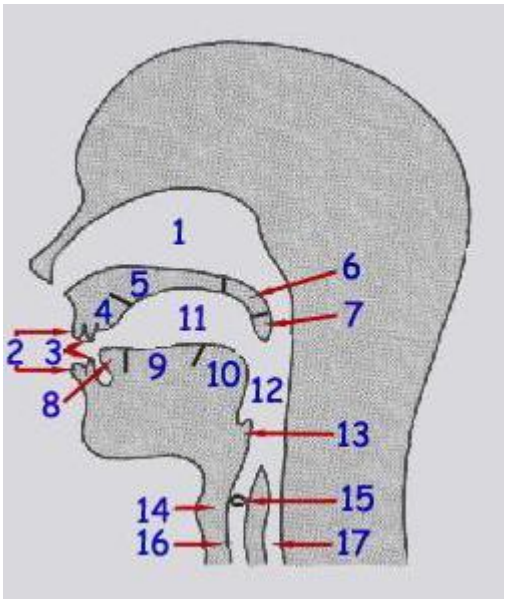
This paper will now attempt to analyze the similarities and differences between the English and the Bengali consonant phonemes (excluding the vowels for no other reasons but lack of space) which constitute the lowest meaningful component of pronunciation. In line with the CAH, it is believed that because Bengali consonants negatively influence the learning of the English consonants, it is necessary for the teacher to make them aware of the differences between them which, in turn, will help the instructor predict students' learning difficulties and design effective learning materials. It might be mentioned here that English is the one most important foreign language in Bangladesh after Bengali which is used for academic, professional and, to some extent, for social purposes as well.

As the first step in the procedure of an analysis of contrasts, each English consonant is categorized according to the features of articulation, i.e., place and manner of articulation and voicing. Aspiration is also taken into consideration because it is a distinctive feature of articulation in Bengali and has somewhat negative influence. The qualitative distinctiveness of Bengali aspiration will be dealt with in more detail later in the paper.

However, because the names of the articulators of the human speech apparatus are associated with the naming of consonants, e.g. *labial* from the lips, *alveolar* from the alveolar ridge, or *dental* from the teeth, a clear understanding of the organs of speech is necessary (See figure 1 below).

Figure 1: The organs of speech

1-nasal cavity
2-lips
3-teeth
4-aveolar ridge
5-hard palate
6-velum (soft palate)
7-uvula
8-apex (tip) of tongue
9-blade (front) of tongue
10-dorsum (back) of tongue
11-oral cavity
12-pharynx
13-epiglottis
14-larynx
15-vocal cords
16-trachea
17-esophagus



A description of the articulators would not be necessary because their names and places are easily identifiable from the diagram. However, alongside the places of articulation, yet another dimension is necessary for the description of consonants, i.e., manners of articulation or the way how the organs behave in their production. For instance, though / p /, / b /, / m /, and /w/, are bilabial , they are different on account of manner; the first two are plosive requiring a complete stricture of the articulators and a final release stage, the third one is nasal requiring a stricture formed by two lips obstructing the egressive pulmonary airflow, then releasing it through the nasal cavity, and the fourth one is an approximant in the articulation of which the two lips are close but not close enough to form a complete stricture.

The feature which comes next in the articulation of consonants is voicing which gives them distinctiveness as in these phonemic pairs:

/ p / and / b /; / t / and /d/; /k / and / g /; / f/ and / v /; / ʃ / and / ʒ /

Place- and manner-wise, the consonants in each pair share the same characteristics but voicing-wise, each one is different from the other forming words with different meanings.
The last feature is aspiration but, unlike in Bengali, this one is not a distinctive feature in the English consonants system; rather, it is responsible for allophonic variations of the same sound. English / t /, for example, is aspirated in syllable-initial positions, but if not aspirated, it may be misunderstood as / d /, especially, by a native English speaker. Similarly, if not aspirated in syllable-initial positions, / p / or / k / may be misunderstood as /b/ or /g/ respectively.

In addition to aspiration being a distinctive feature of Bengali consonants, its nature in Bengali is different from that in English. Whereas aspiration in English occurs when the glottal/h/ follows the consonant, i.e., p + h, t + h or k + h, aspiration in Bengali is 'built-in', that is, the / h / permeates through the whole segment rendering it distinctive, as in the sound to the right in each of the following pairs.

/ p (□)/ vs / $f^{ɦ}$ (□)/; / b (□) vs /$b^{ɦ}$ (□) /; / t̪ (□)/ vs /$t̪^{ɦ}$(□)/; /t(□) / vs / t^{h} (□)

What follows now are the three consonant charts (Figures 2 – 4): one drawn by Gimson (1980), the second by Roach (1982), and the third, the IPA chart (revised to 2015). There are a few minor variations in the names and placements of a few consonants across the charts which will be discussed before an easy and clear chart is drawn in which both the English and the Bengali consonant phonemes appear.

Figure 2: Gimson's consonant chart (1980, p.151)

Place / Manner	Bilabial	Labio-dental	Dental	Alveolar	Post-Alveolar	Palato-Alveolar	Palatal	Velar	Glottal
Plosive	p, b			t, d				k, g	
Affricate					tr, dr	tʃ, dʒ			
Fricative	ʍ	f, v	θ, ð	s, z		ʃ, ʒ			h
Nasal	m			n				ŋ	
Lateral				l					
Continuants /Semi-vowels/Approximants	w				r		j		

Figure 3: Roach's consonant chart (1991, p.62)

Place / Manner	Bilabial	Labio-dental	Dental	Alveolar	Palato-Alveolar/Post-Alveolar	Palatal	Velar	Glottal
Plosive	p, b			t, d			k, g	
Fricative		f, v	θ, ð	s, z	ʃ, ʒ			h
Affricate					ʧ, ʤ			
Nasal	m			n			ŋ	
Lateral				l				
Approximant	w				r	j		

Figure 4: The IPA consonant chart (revised to 2015)

Place / Manner	Bilabial	Labio-dental	Dental|Alveolar| Postalveolar	Retroflex	Palatal	Velar	Uvular	Pharyngeal	Glottal
Plosive	p, b		t, d	ʈ, ɖ	C, ɟ	k, g	q, G		ʔ
Nasal	m	ɱ	n	ɳ	ɲ	ŋ	N		
Trill	B		r				R		
Tap/Flap		ⱱ	ɾ	ɽ					
Fricative	ɸ, β	f, v	θ, ð | s, z | ʃ, ʒ	ʂ, ʐ	ç, ʝ	x, ɣ	χ, ʁ	ħ, ʕ	h, ɦ
Lateral fricative			ɬ, ɮ						
Approximant		ʋ	ɹ	ɻ	j	ɰ			
Lateral approximant			l	ɭ	ʎ	L			

As can be seen from Gimson's consonant chart, the alveolar consonants are followed by post-alveolar and palato-alveolar categories respectively whereas in Roach's chart these two are the same category. In the revised IPA chart, palato-alveolar consonants are replaced with retroflex consonants; dental, alveolar, and post-alveolar categories are bound by one broad column. The term retroflex is a problem because it is not a place and, also, it is not shown vertically as a manner (which in fact it is) in any of the charts; it is the manner in which the tongue is curled upwards and backwards farther than the alveolar region in the oral cavity. This term is assigned to the consonants occurring within the limits of the alveolar and the palato-alveolar regions (but definitely not the palatal region). This is confirmed by the fact that / r / is labeled as a retroflex consonant in the post- or palato-alveolar region though it is observed to be less retroflex than it is in some other languages. To avoid unnecessary confusion, in the chart of English and Bengali consonants that follows, this sound is assigned the position and manner of a palato-alveolar and an approximant having the quality of a retroflex. The problem with / r / does not end here. Strangely, Gimson has placed it in the category of the semivowels along with the two others - / w / and /j /; all three are given alternative names – continuants/semivowels/approximants. By definition, / r / is an approximant but how it is considered a semivowel is difficult to understand although the two others are.

On the chart which follows, therefore, / r / is shown as an approximant, not a semivowel. Besides, Apart from this, Gimson has added two post-alveolar affricates (tr, dr), in addition to these two universally acceptable sounds / tʃ / and / dʒ /, which do not appear elsewhere for the probable reason that they qualify more as consonant clusters than as single phonemes. They are excluded from the chart of English and Bengali phonemes which is next. In the revised IPA chart, on the other hand, what is intriguing is the manner-wise categorization of / l / as a lateral approximant, but an approximant is a consonant in the articulation of which no stricture is formed by the articulators involved whereas, for / l /, the tip of the tongue touches the alveolar ridge to form a stricture allowing the airflow to escape sideways (laterally). In the chart of English and Bengali consonants, therefore, / l / retains its original name and position as an alveolar lateral. These clarifications are manifested in figure 5 below.

Figure 5: A combined chart of English and Bengali consonants

PLACE / MANNER	BILABIAL	LABIO-DENTAL	DENTAL	ALVEOLAR	PALATO-ALVEOLAR	PALATAL	VELAR	GLOTTAL
Plosive	P b **p** (□) **pʰ** (□) **b** (□) **bʰ** (□)		**t̪** (□) **t̪ʰ** (□) **d̪** (□) **d̪ʰ** (□)	t d **ʈ** (□) **ʈʰ** (□) **ɖ** (□) **ɖʰ** (□)		**C** (□) **Cʰ** (□) **ɟ** (□) **ɟʰ** (□)	k g **k** (□) **kʰ** (□) **g** (□) **gʰ** (□)	
Fricative		f v	θ **ʂ** (□)	s z **ʃ** (□)	ʃ ʒ	**ʃ** (□)		h **h** (□)
Affricate					**ʧ** **ʤ**			
Nasal	m **m** (□)		**n̪** (□)	n **n**(□)			**ŋ** **ŋ** (□)	
Lateral			**ɭ** (□)	l				
Approximant	w				ɹ	j		
Flap			**ɾ** (□)	**ɽ** (□) / (□)				

The Bengali consonants (in bold) have been categorized after Choudhury and Choudhury (1983, p.18) and been represented through the IPA notations and their diacritics. The original Bengali consonants appear in parentheses. The chart clearly shows the differences between the two consonant systems in question; however, a discussion that follows about the similarities and differences would make them even clearer.

PLOSIVES

1. / p /, / b / vs / p / (প), /b (ব) /: The English sounds are plosives, so are the Bengali sounds. But /p/ in English is aspirated as mentioned earlier in the syllable-initial position whereas / p / in Bengali is unaspirated. / b / is not problematic because it shares the same characteristics as / b / in Bengali

2. / t /, / d / vs / t (ট)/ ɖ (ড)/: / t / is also aspirated but / d / is not. / t /, therefore it poses problem as far as aspiration is concerned. /d/ offers no problem because the Bengali / ɖ / (ড)/ has almost the same features of articulation (except for a little retroflexion).

3. / k /, / g / vs / k (ক) /, / g (গ) /: Once again, the first sound in English is aspirated whereas the Bengali equivalent is unaspirated. The voiced counterpart of this sound in Bengali is the same; hence no problem. Because aspiration in Bengali is qualitatively different from aspiration in English (as explained earlier), the English voiceless plosive phonemes are likely to be pronounced as / f^h (ফ) /, t^h (ঠ), and /k^h(খ)/ respectively.

FRICATIVES

1. / f /, / v / vs / f^h (ফ), / b^h (ভ) /: The first English sound is a labio-dental fricative but / ফ / is a bilabial plosive; therefore, they are different in terms of both place and manner. The English /v/ is often mispronounced as the Bengali / b^h (ভ)/

2. / θ /, / ð / vs / t̪ʰ /, / d̪ʰ(ধ) /: The English sounds are dental fricative but the Bengali equivalents are dental plosive, that is, they are different in terms of manner. Bengali speakers, by and large, mispronounce these two English sounds.

3. / s /, / z / vs / s (স) /, / ɟ (জ) /, / ɟ (য) /: / s / is alveolar but the Bengali / s (স) / is dental; however it does not offer any significant production and comprehension problem. What is interesting though about this sound is that it is also pronounced as Bengali (ʃ (ষ) / or /ʃ (শ) / which are different from each other place-wise but practically speaking pronounced as the same sound. To conclude, there is almost no difficulty regarding / s /. The second English sound / z / is indeed problematic. There is no equivalent of it in Bengali, so it is mapped onto the similar Bengali sounds as shown. This is a case of single category pattern (Major, 2008) in which case a L2 sound not available in the L1 is perceived and produced as one close to it in the L1 system. This is a clear evidence of L1 interference in L2 aquisition. There is also a psychological dimension attached to the pronunciation of /z/ in that because Bengali speakers are subconsciously aware that this sound is a sub-standard variation of / য / or / জ / (in fact having the same sound) in Bengali, they would not pronounce it in English too.

4. / ʃ /, / ʒ / vs / ʃ (ষ) /, / ʃ (শ) /, / ɟ (য) /, / জ / : The first English sound is palato-alveolar fricative similar to the first two Bengali sounds which are alveolar and palato-alveolar respectively though they are identical in use. The second English sound, the voiced counterpart of / ʃ /, is not available in Bengali and is more often than not pronounced as /য/, / জ/ or / শ / or /ষ / .

5. / h / vs / h (হ) /: / h / is the same as / h / হ /, so it offers no learning problems for Bengali speakers, though, as pointed out earlier, it is differently realized in these Bengali sounds which, by definition, are aspirated: / ফ /, / ভ /, / থ /, / ধ /, / ঠ /, / ঢ /, ছ, / ঝ /, / খ /, and / ঘ / (see the chart on page 11).

AFFRICATES

/ ʧ /, / ʤ / vs / c (চ)/, / ɟ (য) or / ɟ (জ) /: The English sounds are palato-alveolar affricates whereas the Bengali equivalents are palatal plosive. Affricates are in fact plosive first followed by friction. Most Bengali speakers of English tend to pronounce them as they would the Bengali sounds.

NASALS

1. /m/ vs / m (ম) /: Both are bilabial nasals, so no difficulty arises.

2. / n / vs / n (ন) /, / n (ণ) /: The English consonant is an alveolar nasal but its first Bengali counterpart is a dental nasal. The second Bengali sound is a retroflex and similar to the English / n / but because there is little difference between these two Bengali sounds, (Choudhury and Choudhury, ibid, p. 24), the English / n/ is more often than not pronounced as a dental nasal consonant. The difference, therefore, is in the place of articulation.

LATERALS

/ l / vs / l (ল)/: The Bengali lateral is dental but the English equivalent is alveolar. Most Bengali speakers pronounce it as a dental sound in words like ‘pencil, ‘look’, ‘council’ and the like.

APPROXIMANTS

1. / r / vs / ɾ (র) /, / ɽ (ড়) / or / ɽ (ঢ়) /: Approximants are consonants produced by the concerned articulators (in this case, the alveolar ridge and the tip of the tongue) coming close to each other but not close enough to form a stricture. Though Barman (2009, p.37) considers these sounds as approximants, and Bhattacharya (2006) claims Bengali to have even four approximants, they are, in fact, flaps, sounds produced by quick, light, and repeated contacts of the articulators (Choudhury and Choudhury, ibid, p.25). Likewise, Mostafa (2013) rightly observes that there are no approximants in Bengali. It follows that the first Bengali sound in this category is a dental flap while the second and the third are alveolar flaps. Bengali speakers are influenced by all of

these consonants, so they tend to pronounce the English / r / as either a dental flap or as an alveolar flap similar to the last two Bengali sounds but not as an approximant which the English consonant is.

SEMIVOWELS

2. / w /, / j /: These two English consonants are semivowels besides being approximants having no equivalents in Bengali though Choudhury and Choudhury (ibid) claim that there are Bengali semivowels [similar to the English semivowels]; the first one, as they
put it, could be represented as / অও / and the second one as / ইয় / present in words like 'েনওয়া' and 'খাইয়া' [my examples] respectively. Actually, these two should have been represented as / উ / and / ই /, Bengali vowel phonemes. The English semivowels, conversely, are phonetically vowels but phonologically consonants, accounting for the use of 'a' instead of 'an' before a word like 'university' or 'one'. Besides, their pronunciation has a special feature that initially it is /u/ or /i/ respectively, but quickly glides to the adjoining sound involving some stiffening of the muscles around the pharynx in pronouncing words like 'water', 'yes' and so on. Bengali semi-vowels (?) do not share such a feature with their English counterparts. Consequently, considering them as semivowels would be far-fetched and looking for their English equivalents would be meaningless. The above comparison and contrast between English and Bengali consonants is now summarized in figure 6 below.

Figure 6: Summary of comparison and contrast between English and Bengali consonants

English consonants	Bengali equivalents	Aspect/s of difference	Remarks
Plosive /p/ (1) * /t/ (2)* /k/ (3)*	(p) /প/ (1) (t) /ট/ (2) (k) /ক/ (3)	The English sounds are different aspiration-wise	The Bengali sounds (1-3) are not aspirated; their English equivalents are aspirated in syllabus-initial positions. Comprehension difficulty may occur because of lack of aspiration.

Fricative /f/ (4)* /v/ (5) * /θ/ (6)* / ð / (7)* / s / (8)* / z / (9)* / ʃ / (10) / ʒ / (11)* / h / (12)	(f^h) /ফ/ (4) (b^h) /ভ/ (5) (t^h)/থ/ (6) (ɖ) / দ / (7) (s) / স /(8) (ɟ)/ য /, (ɟ) /জ / (9) (ʃ) /শ/, (ʃ) (ʃ) /ষ/(10) (ɟ) /য/, (ɟ) /জ/, (11) (h) / হ / (12)	The English sounds 4-5 are different Place and manner-wise. The sounds 6-7 are different manner-wise. Sound 8 is different place-wise. Sound 9 is Unavailable in Bengali. For number 10: No difference Sound 11 is unavailable in Bengali. For number 12: No difference	The English sounds 4-5 are labio-dental fricative whereas the Bengali equivalents are bilabial plosive sounds. English phonemes 6-7 are dental fricatives but the Bengali counterparts are dental plosive. The English Phoneme number 8 is an alveolar fricative but Bengali phoneme number 8 is dental. The English phoneme number 9 is not available in Bengali, so it is perceived as any of the Bengali phonemes at number 9. The English phoneme number 10 corresponds to the Bengali phonemes at number 10. The English phoneme number 11 is not available in Bengali but perceived as any of the corresponding Bengali phonemes at number 11, i.e., they are perceived as a single phoneme which means two similar phonemes are mapped onto one L1 phoneme (a single category pattern). The English sound 12 and the Bengali counterpart are the same sound.

Affricate /tʃ/ (13)* /dʒ (14)*	(c) /চ/ (13) (ɟ)/জ/, (ɟ) /য/ (14)	Sounds 13 and 14 are different place- and manner-wise.	The English sounds 13 and 14 are palato-alveolar affricates whereas their Bengali counterparts are palatal plosives.
Nasal / m / (15) / n / (16)* / ŋ / (17)	(m) /ম/ (15) (n) /ন/ (16) /ণ/ (16 A) (ŋ) /ং/ (17)	Number 15 is the same as Bengali 15: No difficulty. Sound 16 is different place-wise. Sound 17 is same as its Bengali counterpart.	The English phoneme 15 is same as the corresponding Bengali phoneme. The English phoneme 16 is alveolar but the corresponding Bengali phoneme 16 is dental. The Bengali phoneme 16A, however, corresponds to the English equivalent (number 16) But this sound is practically of no use in Bengali; the result – The English sound in question is mispronounced as a dental sound. The English sound 17 is the same as the Bengali equivalent
Lateral /l/ (18)*	(l) /ল/ (18)	The English sound is different Place-wise	This English sound (18) is alveolar but its Bengali counterpart is dental
Approximant /ɹ / (19)* / w / (20) / j / (21)	(ɾ) /র/ (19A) (ɽ) /ড়/ (19 B) (ɽ̆) /ঢ়/ (19 C) (20) /উ/ (21) / ই/	Sound 19 is different Place and manner-wise The English sounds 20 and 21 are different in quality	The English sound 19 is a palato-alveolar approximant but the Bengali equivalents (19A, 19B, and 19C) are flaps. Sounds 20 and 21 in English are semivowels which correspond to the Bengali sounds 20 and 21 which are actually vowels; they do not have the characteristics of the English semivowels.

1–21 indicate serial numbers of the entries

The sounds marked with asterisks (*) are likely to be problematic

(Adapted from Syed, M. I., 2016, p. 71)

From the chart above and the foregoing discussion, the contrasts between English and Bengali consonants are clearly evident: some are different manner-wise, some are different place-wise, and some are different both place- and manner-wise from their Bengali counterparts. Aspiration-wise, / p /, / t / and / k / differ from / p (প) /, / t (ট) /, and /k (ক)/ respectively as they are aspirated in the syllable-initial position. If they are not aspirated in this position, 'pin', 'ten' or 'Kate' may be misunderstood, especially by a native English speaker, as 'bin', 'den' and 'gate'. Voicing, on the contrary, accounts for different phonemes, but what is important is to notice how some English voiced consonants like / v /, and / ʒ /, for example, are different from / b^h (ভ) /, and / ɟ (জ) / or / ɟ (য) / respectively.

Based on the analysis of similarities and differences between the English and the Bengali consonants, the following list of problematic English consonant sounds is proposed (Figure 7). Prator's hierarchy of difficulty from level 0 to level 5 (cited in Brown, 1994, p. 195) has not been strictly followed because, notwithstanding what CAH claims about L1 negative influence in L2 learning, difficulties are not solely attributable to form but also on a host of social and individual factors (Ellis, 1985, Chapters 5 – 7; Ellis, 1994, Chapters 6 – 12). Having said that, the varying levels of difficulty posed by the concerned English consonants, because they are different of from their counterparts in Bengali or they are absent in it (as recorded in an ascending order), are clear.

Figure 7: Difficult English consonants

The difficult English consonants	Number	Aspects/Descriptions of difference and difficulty	Remark
/h/, / m /, / ŋ /, / d /, / b /, / g /, / ʃ /	Seven	No difference	No difficulty
/ n / , / s/, / w /, / j /	Four	Place of articulation (1st two); the next two (semivowels, bilabial and palatal respectively) are not available in Bengali	Insignificant difficulty
// pʰ /, / tʰ /, / kʰ /	Three	Aspiration	Somewhat difficult
/ l /	One	Place of articulation	Significantly difficult
/ ð /, / θ /	Two	Manner of articulation	Very difficult
/ ɹ /, / f /, / v/ tʃ /, /dʒ /	Five	Both place and manner of articulation	/ v / is the most difficult in this group
/ z /, / ʒ /	Two	Unavailability in Bengali	/ ʒ / is the most difficult of all of the sounds listed

As seen from the chart, seven English consonants (h, m, ŋ, b, d, g, ʃ) should not offer any resistance because they share the same features of articulation with Bengali. Two English consonants (n, s) offer little difficulty while two others (w, j - semivowels) in the same group, though not present in Bengali, offer little difficulty like the previous two in the group, three (p, t. k) are difficult because of aspiration but can be remedied through practice, one (l) is significantly difficult, two (θ, ð) are very difficult, one (v) is the most difficult in its group, and two (z, ʒ) are proposed as the most difficult of all of the consonants on the chart in that they do not exist in Bengali and / ʒ / is especially difficult for a Bengali speaker to pronounce.

In this paper, the analysis of the similarities and the differences between English and Bengali consonants has been performed very carefully and thoroughly with reference to the properties of their articulation. This analysis has brought about an inventory of the English consonants which are likely to pose learning difficulty to Bengali speaking learners of English. However, English vowels (another set of segments in the phonological system of the language), which are likely to pose no less learning difficulty to the same learners, could not be dealt with because of the same reason, lack of space. In addition to segmental phonology, clear understanding of and skills in the supra-segmental features of pronunciation, i.e., syllables, stress, rhythm, and intonation are also worth paying attention to for the development of clear speech but, the truth is, they are not within the scope of this paper. Having discovered the difficulties which, the concerned English consonants might offer, it is now upon the material developer to design appropriate materials and tasks to teach them along with the other elements of pronunciation taking into consideration the differences between the two systems and resulting difficulties as proposed by the CAH. Last but not least, classroom teaching of L2 pronunciation should be integrated with the teaching of the other aspects of language.

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