

*Positive Outcomes of Contrastive Instruction on L2 Phonology*

SM Mohibul Hasan, Dhaka University, Bangladesh

The Asian Conference on Language Learning 2015  
Official Conference Proceedings

**Abstract**

This research essay attempts to examine the effect of explicit pronunciation teaching by reporting the findings of a quasi-experiment which studied the process and outcome of L1-L2 contrastive pronunciation instruction on the learning of English stop consonants by Bangladeshi students of English as a Foreign Language. There were two sections. Results of the intervention section (N=9) were compared with those of the control section (N=9). The students in the intervention section were given contrastive pronunciation instruction while the other section received placebo (L2-only) pronunciation instruction. Their progress in perception and production was measured by pre-tests and post-tests, leading to the following conclusion: Contrastive pronunciation instruction has positive outcomes on Bangla-speaking learners of English.

Keywords: contrastive pronunciation instruction, English stop consonants, quasi-experiment, L2-only pronunciation instruction, Bangla-speaking learners of English

**iafor**

The International Academic Forum

[www.iafor.org](http://www.iafor.org)

## 1. Introduction

SLA researchers have tried to observe the effect of instruction on almost all areas of L2 including pronunciation. In the development of L2 phonology, explicit instruction<sup>1</sup> has been a traditional but dominant trend (for some studies, see Neri, Mich, Gerosa, & Giuliani, 2008, Cardoso, 2011 etc.). Many such instructions utilize the argument of Contrastive Analysis Hypothesis. Lado, the proponent of CAH, observed,

In the comparison between native and foreign language lies the key to ease or difficulty in foreign language learning. Those elements that are similar to native language will be simple for him, and those elements that are different will be difficult. (1957, pp. 1-2)

In other words, contrasting the features of L1 and L2 should predict the difficulties or general difficulty areas of L1-speaking learners of L2 (Crystal, 2003). Thus, conscious instruction on pronunciation forms--especially difficult forms--should bring tangible gains in the pronunciation performance of learners. In fact, based on the CAH, L1-specific lists of English sounds for native speakers of particular languages have been made available in texts like Braithwaite (2008).

In the context of Bangladesh, there were some observational studies on L2 pronunciation (for example, see Hasan, 2000, Hasan, 2013, and Maniruzzaman, 2008). However, there has not been any experiment or quasi-experiment to evaluate the effect of explicit instruction of contrastive features of L1 and L2 on Bangla-speaking learners of English. The present study intends to fill this gap. It will specifically experiment with the instruction of the contrastive features of stop consonants in English and their counterparts and near-counterparts in Bangla to Bangla-speaking learners of English.

## 2. The Difference between Bangla and English Phonological Systems

There are a number of English phonemes that are challenging to learners with L1 Bangla. However, the present study pays attention to only the stop consonants. The main focus will be on the following:

1. English has three voiceless stops /p, t, k/. Depending on their position in a syllable, each of the stops has two main allophones: aspirated and unaspirated. For example, [p<sup>h</sup>] is usually used in syllable-initial positions contrasting phonetically with [p] in other positions. As learners do not know about the importance of aspiration in syllable-initial positions in English, they do not expect initial /p, t, k/ to be aspirated. As a result, when they say or hear words having stops, confusions occur. To a trained ear, their /p, t, k/ sound indistinguishable from their /b, d, g/. Also, when they hear Standard English, they tend to hear /b, d, g/ as /p, t, k/ because they do not know that, in syllable-initial positions, the main difference between the two pairs is aspiration (Roach, 2009). To make matters worse, they

---

<sup>1</sup> Such instructions are also referred to as FoFS (focus on-formS) as defined by Doughty and Williams (1998).

have both voiceless unaspirated plosives /p, t<sup>2</sup>, k/ and voiceless aspirated plosives /p<sup>h</sup>, t<sup>h3</sup>, k<sup>h</sup>/ as individual phonemes in their L1, Bangla. This distribution in Bangla makes them victims of negative transfer from L1 (Selinker, 1972). Therefore, the first instructional focus will be teaching the allophones of /p, t, k/--unaspirated voiceless [p, t, k] following s- or in initial positions of unstressed syllables versus aspirated voiceless [p<sup>h</sup>, t<sup>h</sup>, k<sup>h</sup>] in word-initial or stressed syllable-initial positions.

2. There are three voiced stops in English: /b, d, g/. In case of syllable-initial positions of stop consonants, there is no possibility of misunderstanding between /b, d, g/ and /p, t, k/ if aspiration is maintained properly. However, in syllable-final positions, the phonemes /b, d, g/ are almost-voiceless or completely voiceless (Roach, 2009). In such cases, the cue to the difference between and identification of /p, t, k/ and /b, d, g/ is pre-fortis clipping. As students do not know this, they tend to confuse them. It seems logical for the 2<sup>nd</sup> instructional attention to be given to unaspirated voiceless /p, t, k/ versus unaspirated almost-voiceless /b, d, g/ at syllable-final positions. One advantage for Bangla-speaking learners is that their L1 has /b, d<sup>4</sup>, g/ in her inventory of stop consonant phonemes. Selinker (1972) refers to this kind of phenomenon as positive transfer from L1.

### 3. Specific Research Questions and Hypothesis

The specific research questions of this quasi-experiment are: Does explicit instruction have any effect on Bangla-speaking learners of English in their perceptual and articulatory learning of the pronunciation contrast between:

- (a) unaspirated voiceless /p, t, k/ following s- or in initial positions of unstressed syllables and aspirated voiceless /p<sup>h</sup>, t<sup>h</sup>, k<sup>h</sup>/ in word-initial or stressed syllable-initial positions?
- (b) unaspirated voiceless /p, t, k/ versus unaspirated almost-voiceless /b, d, g/ at syllable-final positions?
- (c)

It is hypothesized that the subjects in the intervention section of this study will experience a difference (compared with those in the control section) from the explicit approach in L2 pronunciation instruction in developing the above-mentioned contrast, which may otherwise affect their intelligibility (Levis, 2005).

### 4. Data Collection and Analysis

#### 4.1 Participants

The participants of the study were 1<sup>st</sup> year undergraduate students of BRAC University, Bangladesh. Out of 18 students, 10 of them were female and 8 were male

---

<sup>2</sup> According to prominent Bangla linguists including Hai (1967) and Shaw (2012), Bangla has /t/, /t<sup>h</sup>/, and /d/ (retroflex) instead of /t/ and /t<sup>h</sup>/, and /d/. However, as replacing retroflex with alveolar stops does not give rise to phonemic difference (in Bangla or English), teaching the difference was not considered worth-instructing.

<sup>3</sup> See footnote 1

<sup>4</sup> See footnote 1

with an average age of 19. They were randomly divided into 2 sections (N=9 each). Their level was similar: intermediate. In this quasi-experimental study, contrastive L2 pronunciation instruction and control instruction were compared using quantitative research methods.

## **4.2 Intervention**

The current study supports that contrastive L2 pronunciation instruction is effective at promoting students' L2 pronunciation learning. Their perception of the metalinguistic knowledge of the contrastive analysis will be assessed through their production of the target phonemes.

Two weeks before the actual intervention, the students of both control and intervention sections sat a pre-intervention test. The perception part of it featured 30 words with syllable-initial fortis/lenis consonants and 40 words with syllable-final fortis-lenis or lenis-fortis pairs (based on *Audio Unit 4* of Roach, 2009). In the production part of it, they read aloud 36 words with the target consonants (/p, t, k/) in initial positions and 21 words with final fortis/lenis stops. The objective of the test was to assess whether they could pronounce English stop consonants correctly.

The students in the intervention section were given instructions on effective perception of contrastive phonetic and phonological features of the target stop consonants of Bangla and English. It included explicit instruction on selected pairs of stop consonants--especially contrastive phonetic and phonological knowledge on target English phonemes and their perceptually similar counterparts in Bangla followed up by listen-and-repeat exercises and explanatory notes. For example, the instructor discussed the importance of aspiration and lack of aspiration in pronouncing English stops; and how to clip the vowels before syllable-final fortis consonants. The intervention was meant to improve the learners' metalinguistic knowledge of contrastive features. On the other hand, the control section received placebo (L2-only) instruction. The entire process took three weeks.

Two weeks after the intervention, to apply their newly gained knowledge, the students were asked first to appear in a perception test which was a different version of the sound discrimination items used in the pre-intervention perception test. And the production component also comprised items similar to the pre-intervention production test but they were ordered in a different way to preclude the elicitation of responses from recognition memory.

## **4.3 Assessment**

During the perception tests, the instructor played audio clips and immediately after listening to them the participants checked one of four answer choices provided in the answer sheet. Only the target plosives were considered while the multiple choices were designed. In other words, one test item tested the candidates only on the target stop consonant. Table 1 shows scoring values for the sample item "peat" in the perception tests:

Student Answer	Score Received
[p <sup>h</sup> i:t]	3
[pi:t]	2
[bi:t]	1
[Ci:t] <sup>5</sup>	0

Table 1. Scoring values for “peat”

In the production tests, the participants were given hardcopies of the test with items such as “peak”, “speak”, “forepeak” etc. Their productions of the test items were recorded digitally on a computer hard disk and then scored. Table 2 shows some sample items in the production tests with student pronunciations and scores.

Sample item	Student Pronunciation	Score	Sample item	Student Pronunciation	Score	Sample item	Student Pronunciation	Score
peak	p <sup>h</sup> i:k	2	speak	spi:k	2	forepeak	fɔ:pi:k	2
	pi:k	1		sp <sup>h</sup> i:k	1		fɔ:p <sup>h</sup> i:k	1

Table 2. Sample items in the production tests

Students may have pronounced /ɪ/ in place of /i:/. However, that did not affect their scores. The test was strictly controlled for any deviances found in their perception and production of phonemes that were not relevant to the experiment.

#### 4.4 Results

To ensure the reliability of the pre-tests, the researcher relied on Cronbach’s Alpha. The values for perception and production pre-tests were 0.90 and 0.95 respectively, signifying very high reliability index. Additionally, before running the independent T-tests, normality distribution assumptions were checked in the Shapiro-Wilk test. The results for post-intervention perception and post-intervention production tests were 0.99 and 0.98 respectively. Thus, the test confirmed the normality distribution assumption extremely highly.

As the two most important assumptions for parametric tests were successfully met, independent T-tests were run to ascertain any difference between the sections. There was no statistically significant difference between the variable of pre-instruction ability of control and intervention sections. In the T-test, the P value of intervention and control sections in the perception pre-test was 0.79 (greater than 0.05), which is not considered to be significant. The t (16) and Cohen’s d values were 0.26 and 0.12 respectively. The P value of the sections in the production pre-test was 0.88 (greater than 0.05), which again is not considered to be significant. The t (16) and Cohen’s d values were 0.15 and 0.07 respectively.

---

<sup>5</sup> Participants were instructed to choose choices starting with C if they heard a non-stop consonant.

The post-intervention tests were carried out to confirm or reject the hypothesis of this research study, which held that contrastive L2 pronunciation instruction would make a difference between the learning experience of the intervention section and that of the control section. Table 3 and 4 show all the details of both sections that were submitted to t-tests to ascertain the effect of independent variables in this study.

		Pre-intervention			Post-intervention		
		Mean	SD	N	Mean	SD	N
Perception	Intervention Section	104.61	4.57	9	123.5	6.56	9
	Control Section	104	5.45	9	115.4	6.46	9

Table 3. Details of Perception

		Pre-intervention			Post-intervention		
		Mean	SD	N	Mean	SD	N
Production	Intervention Section	110.28	6.65	9	127.5	7.95	9
	Control Section	109.78	7.73	9	110.22	9.95	9

Table 4. Details of Production

Statistically strong differences were found in the post-intervention perception test. The P value of intervention and control sections in the perception post-test equaled 0.02, considered to be significant. The t (16) and Cohen's d values were 2.63 and 1.24 respectively. In the post-intervention production test, the P value of the sections was 0.0009. This value is statistically very significant. The other values are t (16) = 4.07 and Cohen's d = 1.92. Cohen's effect size values ( $d \geq 0.8$ ) signaled high practical significance in both perception and production post-tests.

Additionally, to check for any difference, the paired t-tests for dependent variables were run for each individual section as well. Both sections achieved statistically extremely significant intra-section gains from their pre- to post-intervention performance in perception: IS Perception ( $t(8) = -25.07$ ,  $p < 0.0001$ ,  $r = 0.86$ ) and CS Perception ( $t(8) = -30.37$ ,  $p < 0.0001$ ,  $r = 0.69$ ). Intervention Section also did well in their pre- to post-intervention performance in production. The values are IS Production ( $t(8) = -37.05$ ,  $p < 0.0001$ ,  $r = 0.76$ ). However, the CS did not fare well: CS Production ( $t(8) = 0.53$ ,  $p = 0.61$  (not statistically significant),  $r = 0.03$  (very low correlation or small effect)). So, the perception and production pre-tests triggered positive impact on only the competence of the CS.

Therefore, it can be concluded that explicit instruction of the contrastive features of stop consonants in English and their counterparts and near-counterparts in Bangla has immediate outcomes on learners' perception of English stop consonants in both the intervention and control sections; and it had greater outcomes on the intervention section's performance than that of the control section.

#### **4.5 Limitations and Ethical Considerations**

As in the case of most classroom studies, teachers have little to do with the sample size, which mostly depends on the number of students signing up for the course. Besides, in an EFL setting, it is almost impossible to find a class of students with a heterogeneous mix of L1s.

Though there was a control group which was deprived of the treatment, control students' results in this study did not affect their final grades. Students' participation counted towards earning 10 points in the final breakdown of evaluation--irrespective of their achievements. However, they were masked to this.

In addition, the results of the statistical analyses were not examined to discover differences, if any, between male and female learners. Future studies may direct their attention to such variables.

#### **5. Conclusion**

The present quasi-experiment has found encouraging outcomes of explicit instruction of the contrastive features of stop consonants in pronunciation instruction since the achievements of the intervention section in both competence and performance were more statistically significant than those of the control section. It may also be added that the pre-intervention tests might have triggered some consciousness of English stop consonants on the control section leading to their better competence proven through the post-intervention perception test.

This quasi-experimental study has been successful in proposing that explicit contrastive L2 pronunciation instruction can be more efficient than placebo (L2-only) pronunciation instruction. Further experiments should explore whether such explicit contrastive L2 pronunciation instruction can help learners improve their competence and performance in other contexts. If such studies can be replicated in other contexts with similar results, one may conclude that explicit contrastive L2 pronunciation instruction has lasting outcomes on the acquisition of L2 phonology.

#### **Acknowledgements**

The author wishes to thank Dr Hakim Arif of Dhaka University for his resourceful advice on this paper; BRAC University for giving a grant for presenting a preliminary version of this paper to the supportive audiences of the Asian Conference on Language Learning 2015; Ted O'Neill and Steve Cornwell of IAFOR for their encouraging comments and inputs; and BRACU students for their participation in this classroom intervention.

## References

- Braithwaite, M. (2008). *Sounds right*. New Plymouth, New Zealand: Curriculum Concepts.
- Cardoso, W. (2011). Teaching foreign sC onset clusters. In K. Dziubalska-Kolaczyk, M. Wrembel & M. Kul (Eds.). *Achievements and perspectives in second language acquisition of speech: New sounds*. 2010 (pp. 29–40). New York, NY: Peter Lang.
- Crystal, D. (2003). *A dictionary of linguistics and phonetics*. Oxford: Blackwell Publishing.
- Doughty, C., & Williams, J. (Eds.). (1998). *Focus on forms in classroom second language acquisition*. Cambridge, England: Cambridge University Press.
- Hai, A. (1967). *Dhvani vijnan o bangla dhvani-tattwa*. Dhaka: Mullick Brothers.
- Hasan, A. D. (2000). Problems of teaching English sound system. *ELT: Directions and orientations*. (pp. 63–69). Rajshahi, Rajshahi University: Department of English.
- Hasan, S. M. M. (2013). Bangla-specific study of English monophthongs. *BRAC University Journal*, 10 (1 & 2), 41–47.
- Lado, R. (1957). *Linguistics across cultures: Applied linguistics for language teachers*. Ann Arbor: University of Michigan Press.
- Levis, J. M. 2005. Changing contexts and shifting paradigms in pronunciation teaching, *TESOL Quarterly*, 39 (3): 369–77.
- Maniruzzaman, M. (2008). Phonetic and phonological problems encountered by the Bengali speaking efl learner: How can they be overcome? Retrieved from <http://www.articlesbase.com/languages-articles/phonetic-and-phonological-problems-encountered-by-the-bengali-speaking-efl-learner-how-can-they-be-overcome-297445.html>
- Neri, A., Mich, O., Gerosa, M., & Giuliani, D. (2008). The effectiveness of computer assisted pronunciation training for foreign language learning by children. *Computer Assisted Language Learning*, 21, 393–408. doi:10.1080/09588220802447651
- Roach, P. (2009). *English phonetics and phonology: A practical course*. Cambridge, England: CUP.
- Selinker, L. (1972). Interlanguage. *International Review of Applied Linguistics in Language Teaching*, 10 (3), 209–231.
- Shaw, R. (2012). *Sadharan bhasavijnan o banla bhasa*. Kolkata, India: Pustak Bipani.

**Contact email:** mohibul@bracu.ac.bd