

# Error Analysis in the Acquisition of Chinese Phonetics by Bangladeshi Students

Ruyue Zhang<sup>1</sup>, Haitao Lin<sup>2\*</sup>

<sup>1</sup> School of Open Education and Teaching Management, Yunnan Open University, Kunming, China

<sup>2</sup> Yuxi Normal University, Yuxi, Yunnan, 653100, China

\*Corresponding Author: Haitao Lin Email: drhtlin@yxnu.edu.cn

## ABSTRACT

On the strength of the data collected from Bangladeshi students' pronunciation of disyllables at different stages of teaching practice in Bangladesh, the error rates and error forms of Chinese initials and finals were calculated, and the similarities and differences between Chinese and Bengali in terms of consonants and vowels were compared and analyzed. The errors of Bangladeshi students in the acquisition of Chinese phonetics were analyzed according to the Markedness Differential Hypothesis, where the difficulty levels of acquiring initials and finals were ranked to test the hypothesis in terms of the error rate. It also analyzed the causes of errors in the acquisition of Chinese language by Bangladeshi students from the perspective of interlanguage language according to the error forms. This research ended up with analyzing the problems of Chinese phonological acquisition of Bangladeshi students and propose teaching countermeasures in terms of Chinese initials and finals, teachers, and phonological lessons, with the aim of facilitating the development of Chinese teaching in Bangladesh.

**Keywords:** Chinese phonetics, error analysis, Bangladeshi students.

## 1. INTRODUCTION

Taking the local college students and import and export businessmen in the primary Chinese teaching of the Confucius Institute at Bangladeshi North South University as the research object, the one-year research finds that Bangladeshi students of different ages or professional division of labor have certain regularity in the acquisition of Chinese phonetics. The collected data of Bangladeshi phonetics and Bangladeshi students' Chinese phonetic acquisition are systematically compared and analyzed, along with the statistical study, where the crux of the problem is found, and improvement solutions are proposed to provide theoretical support for the development of Chinese teaching in Bangladesh.

## 2. RESEARCH STARTING POINT AND THEORETICAL BASIS

### 2.1. Contrastive Analysis Theory

In 1957, the linguist Lado put forward the theory of "contrastive analysis" for foreign language teaching[1]. Lado advocated comparing the phonetics and grammar

of the first language and the second language, and believed that students learning a second language would have an easier time acquiring the foreign language with the same or similar forms as their native language, while students would have a harder time acquiring the foreign language whose forms are not in or different from their native language.

### 2.2. Markedness Differential Hypothesis

Following the theory of contrastive analysis, linguists began to predict the difficulties of students learning a second language from the perspective of universal grammar. In 1977, Eckman proposed the Markedness Differential Hypothesis[2]. Zhu Yongping mentioned that "based on a systematic comparison of the mother tongue and the target language, the Markedness Differential Hypothesis theory compares the marked relations indicated in universal grammar, so that the difficulties of language learners can be predicted[3]. In this study, the Markedness Differential Hypothesis is used to predict the difficulties of Bangladeshi students in acquiring Chinese initials and finals, and to rank the difficulty levels.

2.3. Interlanguage and Error Analysis Theory

In the 1980s, Lu Jianji introduced the theory of interlanguage[4] for the first time and mentioned that “interlanguage is a linguistic system that arises from the incorrect generalizations and inferences made by foreign language learners about the laws of the target language during the learning process. The five major factors of the mediated language system are the negative transfer of the native language, the interference of the limited knowledge of the target language, the interference of native or foreign cultural factors, the influence of learning or communicative styles and attitudes, and the inappropriate or inadequate explanation of the target language phenomenon by the teacher or textbook” [5]. In particular, the most influential factors are the negative transfer of the native language, the interference of the limited knowledge of the target language, and the inappropriate or inadequate explanation of the linguistic phenomena of the target language by the teacher or the textbook[6].

3. RESEARCH CONTENT: COMPARISON OF CHINESE AND BENGALI PHONOLOGICAL SYSTEMS

The main phoneme in the interlanguage system is the negative transfer of the native language, and the replacement of the target language’s phonological pattern by the native language’s phonological pattern is the most direct manifestation of the interlanguage’s phonology[7]. By comparing the similarities and differences of the phonological systems of Chinese and Bengali, we can predict and analyze the problems and difficulties of Bengali students in acquiring Chinese phonetics to a certain extent. The vowel-hypophone analysis and vowel-consonant analysis are used, and the vowel-hypophone analysis is used for the introduction of Chinese phonology and the vowel-consonant analysis for the introduction of Bengali phonology.

3.1. Comparison of Chinese and Bengali consonant systems

3.1.1. Chinese consonant system

The pronunciation characteristics of Chinese initials are shown in the following table[8].

Table 1 List of Chinese initials

Place of articulation			Bilabial	Dentilabial	Supradental	Blade-alveolar	Blade-palatal	Dorsal	Dorso-velar
Manner of articulation									
Plosive	Unvoiced	Unaspirated	b[p]			d[t]			g[k]
		Aspirated	P [p']			t[t']			k[k']
Affricate	Unvoiced	Unaspirated			z[ts]		zh [tʂ]	j [tɕ]	
		Aspirated			c [ts']		ch [tʂ']	q [tɕ']	
Nasal	Voiced		m[m]			n[n]			ng[ŋ]
Lateral	Voiced			f[f]		l[l]			
Fricative	Unvoiced				s[s]		sh[ʃ]	x[ç]	h[x]
	Voiced						r[ʒ]		

3.1.2 Bengali consonant system

There are 40 Bengali consonant phonemes, but there are actually only 30 consonant phonemes because some

consonant phonemes have the same pronunciation. In particular, there are 27 single consonant phonemes and 3 compound consonants.

Table 2 List of Bengali consonants

Place of articulation			Bilabial	Supradental	Blade-alveolar	Blade-palatal	Palatal alveolar	Palatal	Dorso-velar	Laryngeal
Manner of articulation										
Plosive	Unvoiced	Unaspirated	p[P]		t[t]	tʃ[tʃ]			k[k]	
		Aspirated	ph [P']		th [t']	tʃh [tʃ']			kh [k']	
	Voiced	Unaspirated	b[b]		d[d]	dʃ[dʃ]			g[g]	
		Aspirated	bh		dh	dʃh			gh	

			[b]		[d]	[dʰ]			[g]	
--	--	--	-----	--	-----	------	--	--	-----	--

Continued Table 2 List of Bengali consonants

Place of articulation		Manner of articulation	Bilabial	Supradental	Blade-alveolar	Blade-palatal	Palatal alveolar	Palatal	Dorso-velar	Laryngeal
Affricate	Unvoiced	Unaspirated					ch [tʃ]			
		Aspirated					chh [tʃʰ]			
	Voiced	Unaspirated					j[dʒ]			
		Aspirated					jh [dʒʰ]			
Nasal	Voiced		m[m]		n[n]			ŋ [ŋ]		
Vibrato	Voiced					r[ɹ]				
Flap	Voiced				l[l]					
Lateral	Voiced									
Fricative	Unvoiced			s[s]		sh[ʃ]			h[h]	
	Voiced						y[j]			

3.1.3. Comparison of consonant systems between Chinese and Bangali languages

3.1.3.1. The similarities of consonant systems in Chinese and Bengali languages.

First, from the perspective of pronunciation position, both Chinese consonant phonemes and Bangladeshi consonant phonemes have double lip sound, tongue tip front sound, tongue tip middle sound, tongue tip back sound and tongue face back sound.

Second, from the perspective of pronunciation methods, both Chinese consonant phonemes and Bengali consonant phonemes have plosives, affricates, nasal sounds, marginal sounds and frications.

Third, from the perspective of distinguishing features, both Chinese consonant phonemes and Bengali consonant phonemes have obvious aspirated: non aspirated opposition characteristics. There are 6 pairs of Chinese and 10 pairs of Bengali.

3.1.3.2. The differences of consonant systems between Chinese and Bangali languages.

First, in terms of the number of consonant phonemes, there are 22 consonant phonemes in Chinese and 40 consonant phonemes in Bengali, but some of them have the same pronunciation, so there are only 30 consonant phonemes, but they are still more than Chinese consonant phonemes.

Second, from the perspective of pronunciation position, the lip and tooth sound f [F] in Chinese and the front tongue sound j [t ɛ], q [t ɛʰ], x [ɛ], Tongue tip anterior sound z [ts], c [tsʰ], tongue tip posterior sound zh [t ɕ], ch [t ɕʰ], sh [ɕ], r [z] It is not found in

the Bengali consonant system, while in Bengali, the lingual premaxillary sound ch [t ʃ], chh [tʃʰ], j [d ʒ], jh [d ʒʰ], sh [ʃ], Flicker R [ɹ], Retroapical turbid trill [ɹ̥], Lingual midrange y [j] and laryngeal h [h], not in Chinese.

Third, from the perspective of vocal cord vibration and non vibration, most consonant phonemes in Chinese are unvoiced. When pronouncing, the vocal cord does not vibrate, and there are only five voiced sounds m [m], n [n], ng [ŋ], l [l], r [z]. Among the 30 consonant phonemes in Bengali, there are 13 voiced consonants, accounting for one third of the whole consonant system.

Fourth, from the perspective of pronunciation methods, the pronunciation methods of Chinese consonant phonemes are relatively simple, with only five kinds of plosives, affricates, nasal sounds, lateral sounds and frications, while the pronunciation methods of Bengali consonant phonemes include vibrato and flicker in addition to the above five kinds. Moreover, Chinese plosives, affricates and frications are all clear, while the plosives, affricates and frications of Bengali consonants are turbid There are 10 pairs of consonants, especially plosives and affricates, which not only have the opposite characteristics of aspirated and non aspirated, but also have the obvious opposite characteristics of clear and turbid.

Fifth, from the perspective of syllable structure, Chinese syllable structure is composed of consonants, vowels and tones. There are at most two consonants in a syllable, that is, the initial consonant and the ending consonant-n. The phonetic structure of Bengali is composed of consonants and vowels. At most four consonants in a syllable can appear together as consonant concatenation, such as juktakkhor.

3.2. Comparison of Chinese and Bengali vowel systems

3.2.1. Chinese Vowel System

According to the structure, Chinese finals can be divided into three types: simple finals, compound finals and nasal finals[9].

Table 3 Chinese simple finals

Category	Lingual vowels						Apical vowels		Retroflex vowel
	Front		Middle		Back		Front	Back	Middle
Tongue position	Spreading	Rounded	Spreading	Rounded	Spreading	Rounded	Spreading	Rounded	Spreading
Rounded/spreading									
High/low									
High	i[i]	ü[y]				u[u]	-i[ɿ]	-i[ʅ]	
Half-high	ê[e]				e[y]	o[o]			
Half-low									er[əɾ]
Low			a[a]						

3.2.1.2. Compound finals

Compound finals are composed of two or three vowels. Compound finals can be divided into two types according to the number of vowels: those made up of two vowel symbols are called diphthongs, and those made up of three vowel symbols are called triphthongs. There are 9 diphthongs and 4 triphthongs in Chinese.

Diphthongs: ai[ai], ei[ei], ao[au], ou[əu], ia[iA], ie[iɛ], ua[uA], uo[uo], üe[yɛ]

Triphthongs: iao[iau], iou[iəu], uei[uei], uai[uai]

3.2.1.3. Nasal finals

Nasal finals are formed by combining one or two vowels with the nasal consonant n or ng. Depending on different tail vowels, nasal consonants can be divided into two categories.

3.2.1.1. Simple finals

There are 10 simple vowels in Chinese. From the point of view of place of articulation, there are seven lingual vowels: a, 0, e, ê, i, u, ü; two apical vowels: -i[ɿ], -i[ʅ], and one retroflex vowel: er. The articulation characteristics are listed below.

One category is made up of one or two vowels combined with the mid-tongue turbid nasal consonant “n”, called front nasal final consonants, there are an[an], en[ən], ian[iɛn], in[in], uan[uan], uen[uən], üan[yæn] and ün[yn].

The other category is formed by combining one or two vowels with the lingual root turbinate ng, called postnasal finals, there are ang[ɑŋ], eng[ɛŋ], ong[ɔŋ], iang[iɑŋ], ing[iɲŋ], iong[iɔŋ], uang[uɑŋ] and ueng[uəŋ].

3.2.2. Bengali Vowel System

There are 45 vowels in the Bengali phonological system. There are 8 simple vowels, 22 diphthongs and 15 triphthongs according to the number of vowel phonemes.

3.2.2.1. Phonemes of simple vowels

Table 4 List of Bengali phonemes of simple vowels

Category	Lingual vowels											
	Front				Middle				Back			
Tongue position	Spreading		Rounded		Spreading		Rounded		Spreading		Rounded	
High/low	Long	Short	Long	Short	Long	Short	Long	Short	Long	Short	Long	Short
High	i:[i:] i[i]										u:[u:] u[u]	
Half-high	e[e]										o[o]	
Half-low	e[æ]										ô[ɔ]	
Low					a[a]							

3.2.2.2. Phonemes of compound vowels

A compound vowel phoneme is a syllable made up of two or more vowels. There are 22 diphthongs and 15 triphthongs in Bengali.

a. Diphthong phonemes

ia[ia], ea[ea], ua[ua], oa[oa], io[iɔ], io[io], uo[uo], ei[ei], ai[ai], oi[oi], ui[ui], ou[ou], au[au], eu[eu], iu[iu], io[io], ao[æo], ao[ao], ow[ɔo], ie[iɛ], ue[ue]

Three of the 22 diphthong phonemes are pronounced the same as the diphthongs in Chinese:

uo[uo], ei[ei], ai[ai]

Eight of them are similar to the pronunciation of diphthongs in Chinese:

ia[ia], ua[ua], ui[ui], ou[ou], iu[iu], au[au], ao[æo], ao[ao], ie[ie]

The remaining 10 diphthong phonemes are unique to the Bengali vowel system.

#### b. Triphthong phonemes

aia[aiɑ], eia[eia], oia[oiɑ], uia[uiɑ], aie[aiɛ], oie[oiɛ], oio[oiɔ], aio[aiɔ], aua[auɑ], eua[eua], ɔua[ɔua], ɔoa[ɔoa], eoa[eoa], ɛoa[ɛoa], aoa[aoɑ]

The form of the triphthong phoneme composition in Bengali is more complex, but mainly consists of five vowels a, o, e, i, and u repeatedly, and the middle vowel is mainly i, u, or o. In writing, the form is changed, when the middle vowel is i[i], a semivowel y[j] is added after i[i]; when the middle vowel is u[u], a w[w] is added after u[u]; when the middle vowel is o[o], o[o] shall be turned into w[w]. For example, when writing triphthongs of aia[aiɑ], eia[eia], oia[oiɑ], uia[uiɑ], aie[aiɛ], oie[oiɛ], oio[oiɔ], aio[aiɔ], the semivowel y[j] shall be added after the middle i, such as maiya[maiiɑ], meaning “girl”. When writing triphthongs of aua[auɑ], eua[eua], ɔua[ɔua], the semivowel w[w] shall be added after the middle u, such as kauwa[kauɑ], meaning “cow”. When writing triphthongs of ɔoa[ɔoa], eoa[eoa], ɛoa[ɛoa], aoa[aoɑ], the middle vowel o shall be turned into w[w], such as hawa[haoɑ], meaning “wind”.

The triphthong phonemes in Bengali are all unique to Bengali, and there are no syllables same as the triphthong vowels in Chinese.

### 3.2.3 Comparison of the Vowel Systems of Bengali and Chinese

#### 3.2.3.1. Similarities between the vowel systems of Bengali and Chinese

Firstly, in terms of the classification of vowels, both Chinese and Bengali vowel systems have simple and compound finals.

Secondly, in terms of the number of vowels, there is not much difference between the number of Chinese and Bengali vowels, 10 in Chinese and 8 in Bengali.

Thirdly, in terms of specific vowel phonemes, Chinese and Bengali have four identical simple finals and three identical compound finals, such as a, i, u, o, and uo[uo], ei[ei], and ai[ai].

#### 3.2.3.2. Differences of vowel system of Chinese and Bengali

Firstly, in terms of the place of articulation of the simple finals, Chinese has the apical vowels of -i[ɿ] and -i[ʅ], and Bengali has no apical vowels.

Secondly, in respect of the number of compound finals, there are 13 diphthongs in Chinese and 22 in Bengali, 9 more than those in Chinese; there are 2 triphthong vowels in Chinese and 15 triphthong phonemes in Bengali, 12 more than those in Chinese.

Thirdly, from the point of view of vowel distinction, Bengali vowels have two pairs of long and short vowels opposite to each other for distinguishing the meaning, such as i and i:, u and u:. Chinese vowels have no distinction between long and short vowels.

Fourthly, regarding specific vowel phonemes, Chinese has ü, -i[ɿ], -i[ʅ], and er, all of which are not found in Bengali, making it difficult for Bengalis to learn these vowels.

### 3.3. Predicting the Difficulties in Acquiring Chinese Initials and Finals for Bangladeshi Students

#### 3.3.1. Predicting the Difficulties in Acquiring Initials

According to Eckman's Markedness Differential Hypothesis, there are 6 levels of difficulty in acquiring the Chinese consonant system for Bangladeshi students, as follows from low to high.

m, n, l, s, f < b, d, g < p, t, k, h, sh < j, q, x < zh, ch, r, z, c,

Level 1: m, n, l, s, f

Minimal difficulty level.

Level 2: b, d, g

When Bangladeshi students acquire the voiceless consonants b[p], d[t], and g[k] in Chinese, they may vibrate their vocal cords and pronounce them as voiced consonants.

Level 3: p, t, k, h, sh

For Bengali students, p, t, and k are a little more difficult to acquire compared to their native language; when acquiring h[x], they may be influenced by negative transfer from their native language, and sh[ʃ] is less marked in Chinese than sh[ʃ] in Bengali.

Level 4: j, q, x

These three consonants are unique to the Chinese consonant system but not to the Bengali phonological system, so Bengali students acquire these three consonants with a higher difficulty level, and x[ɕ] is more difficult than j[tɕ] and q[tɕ].

Level 5: zh, ch, r, z, c

ch[tʃ] in Bengali is unaspirated, and ch[tʃʰ] in Chinese is more highly marked and has a higher difficulty level; j[tɕ], q[tɕ], x[ɕ] and z[ts], c[tsʰ] are all

consonants unique to Chinese and not found in Bengali, and palatalization is a common phenomenon in phonological change.

### 3.3.2. *Predicting the Difficulties in Acquiring Finals*

According to the Markedness Differential Hypothesis, the difficulty levels of Chinese finals from low to high are as follows:

After comparing the vowel systems of Chinese and Bengali, the author predicted the difficulty level of Chinese finals acquisition for Bengali students according to the Contrastive Analysis and the Markedness Differential Hypothesis, and the difficulty levels of Chinese finals from low to high are as follows:

Level 1: a, o, i, u, uo, ei, ai

The above seven vowel phonemes are found in both languages and have the same place and manner of articulation, so they belong to the unmarked form of language and are not very difficult for Bangladeshi students to acquire, ranking the level 1.

Level 2: iao, in, ian, an, ang, en, uai, uen, uan, uang, ong, iong, iang

These 13 finals are found in Chinese but not in Bengali. However, these finals are not difficult to spell and belong to the universal grammar. The marking degree is not high, and the possible forms of bias are relatively single, so the difficulty level of acquisition is not large.

Level 3: ao, ia, ua, uei, ou, iou, ie, e

The reason why ao, ia, ua, ui(uei), ou, iu(iou), ie, e are ranked at level 4 is that these 8 finals have the same mnemonic symbols as in Bengali, notwithstanding the different pronunciation. Therefore, they are more likely to be errors by the negative transfer of the native language.

Level 4: eng, ing

These two nasal finals correspond to en and in respectively, where the former is made by combining a vowel with a turbid nasal “ng” at the base of the tongue and is pronounced very backward, while the latter is made by combining a vowel with a turbid nasal “n” at the tip of the tongue and is pronounced relatively forward; relatively speaking, the latter is more common and less marked. Bangladeshi students have more difficulty in acquiring eng and ing than en and in.

Level 5: üe, ün, üan, er

These three finals are all [y-] finals, in which not only do the lips have to be rounded when pronouncing, but also the muscles around the lips have to be hard and tense. In various languages, this way of pronunciation is

not common, so the marking degree is higher and it is more difficult for Bangladeshi students to acquire.

er is the retroflex in Chinese, and there is no such pronunciation in Bengali. The retroflex has a rolled tongue as a marker, so the marker degree is higher and the difficulty level of acquisition is higher.

Level 6: ü, -i[ɿ], -i[ʅ], ueng

The reason why the difficulty level of ü is ranked after üe, ün, üan is because when pronouncing üe, ün, üan, there are other vowels and consonants in the transition, so the lips do not need to always pinch up, so it is relatively easy to pronounce; while ü is a high rounded vowel in front of the tongue, the lips need to always pinch up to pronounce correctly during the pronunciation process, so it is more difficult than üe, ün, üan.

-i[ɿ], -i[ʅ] are apical vowels, while Bengali does not have apical vowels, but only lingual-faceted vowels. According to the first theory of Markedness Differential Hypothesis, those components of the target language that are different from the native language have great difficulty if they have more markers than the native language. The situation of -i[ɿ], -i[ʅ] in the Chinese phonological system is also special in that they do not appear separately, but only follow z, c, s and zh, ch, sh, r respectively, which are in a way the extensions of these seven consonants respectively. Since z, c, s and zh, ch, sh, r are consonants of higher difficulty level in Chinese, -i[ɿ], -i[ʅ] may become a major difficulty for Bangladeshi students in acquiring vowels.

Ueng is not a commonly used syllable in Chinese, and it is not only necessary to close the lips firstly when pronouncing it, but also the tongue root has to be highly tense in order to pronounce it correctly. More markers make the difficulty level higher among Bangladeshi students in acquiring this final.

Therefore, in summary, the difficulty level of Bengali students in acquiring the Chinese vowel system, from left to right and from low to high, is:

a, o, i, u, uo, ei, ai < iao, in, ian, an, ang, en, uai, uen, uan, uang, ong, iong, iang < ao, ia, ua, ui, ou, iou, ie, e < eng, ing < üe, ün, üan < ü, er, -i[ɿ], -i[ʅ], ueng.

## **4. AN EMPIRICAL STUDY: BANGLADESHI STUDENTS' ACQUISITION OF CHINESE INITIALS AND FINALS**

### ***4.1. Survey on the Errors in the Acquisition of Chinese Initials and Finals***

#### ***4.1.1. Designing phonological survey items***

When designing the phonological survey items, we

designed a questionnaire for initials and a questionnaire for finals respectively. The survey included 21 initials and 39 finals of Chinese. In the initial survey item list, words with the same final were selected, such as Biao Bai (表白) vs. Piao Bai (漂白) and Jiang Hua (讲话) vs. Qiang Hua (强化). In the final survey item list, words with the same initial in the same position were selected, such as Bei Mian (背面) vs. Bai Mian (白面) and Liao Tian (聊天) vs. Liu Tian (六天), in order to better investigate the difficulty of Bangladeshi students' acquisition of initials or finals with similar or similar pronunciation. Tables 5 and 6 below show the survey forms of Chinese initials and finals, respectively.

Table 5 Survey items of Chinese initials among Bangladeshi students

biǎo bái piǎo bái	mǎn yì fān yì
表白 漂白	满意 翻译
dòng róng tōng róng	mǎi mai nǎi nai
动容 通融	买卖 奶奶
mǎn fēn nán fēng	liú liàn niú nián
满分 南风	留恋 牛年
guān xīn kuān xīn	kǒng bù hóng bù
关心 宽心	恐怖 红布
jiǎng huà qiáng huà	qiáng bì xiǎng bì
讲话 强化	墙壁 想必
shí táng xǐ táng	xiàng pí shàng pí
食堂 喜糖	橡皮 上皮
zhī dào chí dào	chǎo ròu shāo ròu
知道 迟到	炒肉 烧肉
zhí jiē shì jiè	zhǔn shí zūn shī
直接 世界	准时 尊师
cí dài zhǐ dài	suàn jì zhuàn jì
磁带 纸袋	算计 传记
rěn ràng zhèn zhǎng	chí xù zì xù
忍让 镇长	持续 自序
chǔn huò cún huò	sòng dú zhòng dú
蠢货 存货	诵读 重读
chū chǎn rú rǎn	shāng rén cáng rén
出产 濡染	商人 藏人
cū guǎng shǔ guāng	shuàn cài suān cài
粗犷 曙光	涮菜 酸菜
shǎo shù ráo shù	
少数 饶恕	

Table 6 Survey items of Chinese finals among Bangladeshi students

lǎ ba	wǒ men	rè liè
喇叭	我们	热烈
dìng lǜ dìng lǐ	nǔ lì lǚ lì	
定律 定理	努力 履历	
bèi miàn bái miàn	dào jiā dòu jiǎ	
背面 白面	道家 豆浆	
dǎo shī diào shì	ān quán máng quán	
导师 吊饰	安全 盲拳	
fēn fán fēng fàn	rén mín pín mín	
纷繁 风范	人民 贫民	

péng hú hóng hú	tōng bào tāng bāo
澎湖 鸿鹄	通报 汤包
jiā rén jiē rèn	liáo tiān liù tiān
家人 接任	聊天 六天
jiǎo huá jiǎn huà	jǐn zhāng jǐng zhǎng
狡猾 简化	紧张 警长
yǒng yuǎn liáng yuán	huà huà huǒ qì
永远 良缘	画画 火气
huái yí huí yì	wǎn lián wǎng liàn
怀疑 回忆	挽联 网恋
wēn dù bái tóu wēng	yùn qì yuè qì
温度 白头翁	运气 乐器
xuān xiǎo wán xiào	cí dài zì xù
喧嚣 玩笑	磁带 自序
zhí jiē shì jiè	ér gē kǒu wèi
直接 世界	儿歌 口味

4.1.2. Selection of survey subjects

Fourteen students were randomly selected from the Confucius Institute of North South University and the Chinese Department of University of Dhaka, where there are more students and where Chinese language teaching is more mature, and were divided into three groups according to the length of their study time. As shown in Table 3.3, the students in the first group were from the level 2 students of Confucius Institute at North South University, i.e., students who had just studied Chinese for 3 months and entered the level 2, which belonged to the elementary level in the primary stage; the students in the second group were also from the level 3 students of Confucius Institute at North South University, i.e., students who had just studied Chinese for 6 months and entered the level 3, which belonged to the intermediate level in the primary stage.

Table 7 Table of the Bangladeshi primary-level respondents

Basic Information Chinese Level	Chinese Name	Gender	Age	Study Periods (Month)	Study Location
Elementary	安妮	F	21	3	Confucius Institute of NSU
	李诗诗	F	20	3	Confucius Institute of NSU
	莫凯生	M	33	3	Confucius Institute of NSU
	何慕	M	22	3	Confucius Institute of NSU
	艾伯丁	M	23	3	Confucius Institute of NSU
Intermediate	木寿礼	M	38	6	Confucius Institute of NSU
	尹卓	M	33	6	Confucius Institute of NSU

Advanced	米丹	M	22	6	Confucius Institute of NSU
	李奥	M	26	6	Confucius Institute of NSU
	阿祖	M	19	12	Chinese Department of Dhaka University
	赛夫	M	22	12	Chinese Department of Dhaka University
	米顿	M	25	12	Chinese Department of Dhaka University
	佳米娅	F	20	12	Chinese Department of Dhaka University
	佳信	M	22	12	Chinese Department of Dhaka University

4.1.3. Collection of Speech Samples

During the recording of the speech sample collection, the subjects had to read aloud the words in the table one by one. After collecting the speech samples in batches and for a long time, a more comprehensive

Table 8 Error rates of Bangladeshi students' acquisition of initials at different stages

3 Months			6 Months			12 Months		
Ranking	Initials	Error rate	Ranking	Initials	Error rate	Ranking	Initials	Error rate
1	m	0%	1	m	0%	1	m	0%
1	f	0%	1	f	0%	1	f	0%
3 Months			6 Months			12 Months		
Ranking	Initials	Error rate	Ranking	Initials	Error rate	Ranking	Initials	Error rate
1	n	0%	1	n	0%	1	n	0%
1	l	0%	1	l	0%	1	l	0%
1	d	0%	1	d	0%	1	g	0%
6	b	11%	6	h	10%	1	b	0%
7	sh	13%	7	g	17%	7	d	6%
8	g	20%	8	b	25%	8	sh	8%
9	t	27%	9	p	25%	9	k	10%
10	h	32%	10	k	25%	10	q	12%
11	j	38%	11	sh	28%	10	j	16%
12	q	40%	12	t	33%	12	t	27%
13	x	40%	13	s	33%	13	ch	30%
14	p	47%	14	j	36%	14	h	36%
15	k	52%	15	q	38%	15	r	42%
16	zh	57%	16	ch	38%	16	x	43%
17	r	60%	17	x	39%	17	s	47%
18	s	60%	18	r	42%	18	zh	50%
19	z	67%	19	c	45%	19	c	52%
20	ch	70%	20	zh	54%	20	p	60%
21	c	88%	21	z	67%	21	z	80%

original data of speech samples was obtained.

4.1.4. Listening and Discriminating Speech Samples

The collected speech samples were repeatedly listened and discriminated to determine the correctness of the Bangladeshi students' pronunciation, and the actual wrong pronunciation of the students was recorded with the international phonetic alphabet and converted into textual information.

4.1.5. Statistics on the Error Form and Rate of the Speech Samples

The actual error rates of each group (elementary, intermediate and advanced) for each initial and final were calculated based on the calculation method of error rate [10].

4.2. Error Analysis in the Acquisition of Initials

4.2.1. Errors in the Acquisition of Initials

After the specific statistical analysis was completed, the error rates and forms of Chinese initial acquisition among Bangladeshi students at different learning stages were obtained, as shown in Table 8 and Table 9.

Table 9 Error Forms in each stage of initial acquisition of Bangladeshi students

Error Forms Initials	3 Months	6 Months	12 Months
b[p]	[p][b]	[p']	



p[p']	[p]	[p]	[p][f]
m[m]			
f[f]			
d[t]			[d]
t[t']	[t]	[t]	
n[n]			
l[l]			
g[k]	[k']	[g]	
k[k']	[k]	[k]	[x]
h[x]	[h]	[h]	[h]
j[te]	[te'] [d3] [ ts]	[ ts] [d3]	[ ts]
q[te']	[e] [te ]	[te ]	[e ]
x [e]	[s][te] [ts'] [te ] [w]	[s] [te']	[s][te]
zh[ts]	[d3][ts] [ t]	[d3][ts]	[d3][ts]
ch[[ts']	[d3][ t'] [ts'] [s] [ ,]	[d3][ t']	[d3][ t'] [ts]

sh[s]	[ts'] [ ,]	[ ,]	[ ']
r[z]	[r]	[r]	[r]
z[ts]	[ts] [ d3] [ t] [te]	[ts] [ d3] [ t]	[ts] [t] [ d3]
c[ts']	[t] [ts] [s] [ ,]	[ t] [s]	[t] [ts] [s]
s[s]	[ts'] [t] [ts] [s]	[ts'] [ ,]	[t]

4.2.2. Difficulty Rating of Errors in Initials Acquisition

The total error rate of each initial in the three stages was used to rank the difficulty level of Bangladeshi students' acquisition of Chinese consonants, and the following table shows the total error rate and overall ranking of each initial in the three stages.

Table 10 Total error rate and overall ranking for each initial in three stages

Total error rate and ranking of the three stages								
Ranking	Initials	Error Rate	Ranking	Initials	Error Rate	Ranking	Initials	Error Rate
1	m	0%	8	sh	16%	15	p	44%
1	f	0%	9	h	26%	16	ch	46%
1	n	0%	10	t	29%	17	s	47%
1	l	0%	10	k	29%	18	r	48%
5	d	2%	12	q	30%	19	zh	53%
6	b	12%	12	j	30%	20	c	61%
6	g	12%	14	x	40%	21	z	71%

The survey results show that the acquisition error rate of *m*, *n*, *l*, and *f* is zero in the three stages; *b*, *d*, and *g* have certain error rates, but the error rate is very low, all below 20%, and the form of error is also very single; the error rates of *sh*, *h*, *t*, and *k* are all below 30%, ranking in the third level; the error rates of *j*, *q*, and *x* are close, and the error rate of *x* is higher, which is more difficult to learn. These three initials are ranked in the fourth level; *zh*, *ch*, *r*, *z*, and *c*, which are Chinese-specific consonants, have very high error rates from beginning to end. There are many forms of error, and the total ranking shows that the difficulty level is also very large. It is almost exactly consistent with the difficulty level preset in the previous period and the difficulty level obtained from the statistical survey. The difference

mainly appears in the level preset for *s* and *p*. In the hypothesis, *p* originally belongs to the third level and the acquisition difficulty is medium, but in the survey results, the error rate is higher, ranking fourth level; *s* is a common pronunciation in Chinese and Bengali, unmarked, ranking first level, but the survey results show that the error rate of *s* is very high, ranking fifth level.

4.3. Error Analysis in the Acquisition of Finals

4.3.1. Errors in the Acquisition of Finals

The error rates and forms of Chinese vowels acquired by 14 Bangladeshi students at various stages are shown in Table 11 and Table 12.

Table 11 Error rate of final acquisition of Bangladeshi students at each stage

3 Months			6 Months			12 Months		
Ranking	Finals	Error rate	Ranking	Finals	Error rate	Ranking	Finals	Error rate
1	a		1	a		1	a	
1	o		1	o		1	o	
1	ei		1	ai		1	e	
1	ao		1	ei		1	an	
1	en		1	ao		1	en	
1	i		1	ou		1	ong	
Ranking	Finals	Error rate	Ranking	Finals	Error rate	Ranking	Finals	Error rate
1	in		1	an		1	i	

1	uan		1	ang		1	iao	
1	uang		1	ong		1	ian	
10	iao	4%	1	i		1	in	
11	an	5%	1	ie		1	iang	
12	ang	8%	1	iao		1	iong	
13	ong	10%	1	ian		1	uan	
14	ian	13%	1	in		1	uen	
15	ie	15%	1	iong		1	uang	
16	e	20%	1	uai		16	ang	4%
16	uo	20%	1	uan		17	ai	10%
16	uai	20%	1	uen		17	ou	10%
16	uen	20%	1	uang		19	ei	20%
20	üe	24%	20	en	10%	19	ie	20%
21	u	25%	20	üan	10%	21	iou	23%
22	ia	30%	22	ia	20%	21	e	23%
23	ou	33%	22	iang	20%	23	uei	25%
24	ai	40%	24	u	22%	24	u	27%
24	eng	40%	25	iou	24%	25	üe	28%
24	iang	40%	26	uei	25%	26	eng	33%
24	iong	40%	26	e	25%	26	ing	33%
28	üan	44%	26	uo	25%	28	ia	40%
29	-i [ɿ]	50%	26	ün	25%	28	uai	40%
30	uei	55%	26	er	25%	28	er	40%
31	iou	58%	31	ing	42%	31	ao	45%
32	ün	60%	32	eng	45%	32	-i [ɿ]	55%
32	ing	60%	33	üe	55%	33	üan	56%
32	er	60%	34	ua	56%	34	ua	60%
35	-i[ɿ]	70%	35	ü	63%	34	ü	60%
35	ü	70%	35	-i[ɿ]	63%	34	ün	60%
37	ua	80%	37	-i[ɿ]	75%	37	ueng	80%
38	ueng	100%	38	ueng	100%	38	-i[ɿ]	90%

Table 12 Error Forms in each stage of final acquisition of Bangladeshi students

Error Forms	3 Months	6 Months	12 Months
Finals			
a[A]			
o[o]			
e[]	[e]	[e]	
i[i]			
-i[ɿ]	[i]	[i]	[uo][i]
-i[ɿ]	[i] [e][ai]	[i] [e]	[i][e][u][ai]
er[ər]	[ə]	[ə]	[ə]
ai[ai]	[ei]		[iɛ]
ei[ei]			[iɛ]
ao[au]			[əu] [iaɯ]
ou[əu]	[uo] [au]		[uo]
an[an]	[ən]		
en[ən]		[an]	
ang[ɑŋ]	[an][iaŋ][uŋ]		uŋ][an]
eng[ɛŋ]	[ən] [ɑŋ]	[ən] [ɑŋ]	[ən]
ia[iA]	[iɛ][ia]	[ia]	[ia]
ie[iɛ]	[ei][iə]		[ei]
iao[iaɯ]	[au]		

iou[iəu]	[iʊ][ui]	[iʊ]	
ian[iɛn]	[iɑŋ][iɛn]		
in[in]			
iang[iɑŋ]	[iɛn]	[iɛn]	
iong[yŋ]	[iɑŋ]		
ing[iŋ]	[in]	[in][yŋ]	[in]
u[u]	[iʊ][y][i]	[y]	[i][iʊ][ui]
ua[uA]	[u:a]	[u:a]	[u:a]
uo[uo]	[uɔ][u:ɔ]	[u:ɔ]	
uai[uai]	[uei]		[uan]
uei[uei]	[ui]	[ui]	[ui]
uan[uan]			
uen[uən]	[uan]		
uang[uɑŋ]			
ueng[uəŋ]	[uən][uɑŋ]	[uən][uɑŋ]	[uən]
ong[uŋ]	[ɑŋ]		
ü[y]	[u][i][ui]	[u][ui]	[u][i][ui][iu]
Ûe[yɛ]	[yɛn]	[ue]	[uən]
üan[yən]	[uan] [iɛn] [an]	[uan]	[uan][iɛn]
Ûn[yn]	[uən]	[in]	[uən][in]

4.3.2. Difficulty Rating of Errors in Finals Acquisition

stages was calculated for Bangladeshi students' acquisition. See Table 13.

The total error ranking of each final in the three

Table 13 Total error rate and ranking of each final in the three stages

Total error rate and ranking of each final in the three stages								
Ranking	Finals	Error Rate	Ranking	Finals	Error Rate	Ranking	Finals	Error Rate
1	a		13	uen	7%	27	iou	35%
1	o		15	ie	12%	28	üe	36%
1	i		16	iong	13%	29	üan	37%
1	in		17	ou	14%	30	eng	39%
1	uan		18	e	15%	31	er	40%
1	uang		18	ao	15%	32	ing	45%
7	an	1%	20	ai	17%	33	ün	48%
7	iao	1%	21	iang	20%	34	-i[ʌ]	56%
9	en	2%	21	uai	20%	35	ü	64%
10	ong	3%	23	uo	23%	36	ua	66%
11	ian	4%	24	u	25%	37	-i[ɿ]	78%
11	ang	4%	25	ia	30%	38	ueng	93%
13	ei	7%	26	uei	35%			

a, o, and i are vowels in the native language of Bangladeshi students and are presumed to be in the first level, and the survey results prove that these three vowels do not have errors; in, uan, and uang are ranked in the second level because they are in Chinese but are not difficult to spell, and the survey results show that these three rhymes also do not have bias and thus should be classified in the first level; an, iao, ian, en, ong, ang, uen, which are seven finals ranked in the second level in the hypothesis, from their single error form and rate of

less than 10%, still ranked in the second level; in this level, ei in the first level in the hypothesis occurred errors, ranked in the second level; iong and iang, which should have been in the second level, due to slightly more error form and slightly higher error rate, ranked in the third level with uai, which was in the second level in the hypothesis, and ai, which is the first level in the hypothesis, is also ranked at the third level, and e, ie, ao, and ou remain unchanged and are still at the third level. The rhymes uo, ia, uei, iou, which have the same notation as the vowels in Bengali but are actually

pronounced differently and are ranked at the third level, are also ranked at the fourth level in the survey results, and *u*, which should be at the first level, is also ranked at the fourth level due to its higher error rate; the finals *ue*, *eng*, *üan*, *er*, *ing*, and *iin*, which are postnasal finals, [y-] finals, and *er* finals, respectively, had very high error rates from the beginning to the end of this stage, with a variety of error forms, which matched the hypothesized level 5; the finals -i[ɿ], ü, -i[ɿ], and *ueng* in the hypothesized level 6 were also found to be the rhymes with the highest acquisition error rates, as we expected. *ua* in the hypothesized level 4 became a difficult final to acquire in this level due to its high error rate.

The survey proved that our predetermined difficulty levels and the difficulty level divisions derived from the survey at Level 2, Level 5 and Level 6 are almost exact matches. According to the survey results, the difficulty levels for the acquisition of Chinese rhymes by Bangladeshi students are:

a, o, i, in, uan, uang < ei, ai, ao, an, en, iao, ian, uen, ang, ong < iong, iang, ie, e, uai < ia, ou, iou, uei, uo, u < eng, ing, üe, ün, üan, er < ü, ua, -i[ɿ], -i[ɿ], ueng.

## **5. ANALYSIS OF RESEARCH RESULTS AND ERRORS ATTRIBUTION AND RESPONSES**

### **5.1. Error Attribution of Phonetic Acquisition**

#### *5.1.1. Negative transfer of mother tongue*

##### 5.1.1.1. Initials

According to the results of the survey, Bangladeshi students' acquisition of Chinese phonetics is greatly influenced by the negative transfer of their mother tongue [11], which is mainly reflected in the fact that the actual pronunciation of the same consonants is different.

Among the consonants in Bengali, there are 16 consonants with the same phonetic symbols as those in Chinese, among which 5 consonants have the same phonetic symbols as those in Chinese, and the actual pronunciation is also the same: *m*, *n*, *l*, *f*, *s*. The remaining 10 consonants have the same phonetic symbols as those in Chinese, but the actual pronunciation is different, with subtle differences: *b*, *p*, *d*, *t*, *g*, *k*, *h*, *j*, *ch*, *sh*, *r*.

##### 5.1.1.2. Finals

In Bengali, there are two pairs of long and short vowels, [i] and [i:], [u] and [u:], while in Chinese, there is no distinction between long and short vowels, only the corresponding [i] and [u]. As a result, when Bengali students acquire *uo* and *ua*, they pronounce [u] as [u:],

which becomes [u:o] and [u:a]. The *u* that should have been made as a prepositional glide instead gets emphasized, while the *a* and *o* as the main vowel in diphthong do not get emphasized, and the pronunciation is incomplete, which leads to *uo*[uo] and *ua*[uΛ] being pronounced before the mouth is fully opened, and the sound made is not loud, or even a little slurred and low. This error becomes more obvious when *uo* and *ua* are spelled with the lingual consonant *h*[x]. Bangladeshi students often pronounce the lingual consonant *h*[x] in Chinese as the voiced consonant *h*[h] in their native language, which is pronounced very backward. When *h* is spelled with *ua* or *uo*, the overly backward voiced consonant makes the preposition *u* stressed, which in turn is pronounced as the long vowel *u*[u:].

### *5.1.2. Negative Transfer of Target Language Knowledge*

#### 5.1.2.1. Initials

Bangladeshi students have the problem of overgeneralization in the process of acquiring Chinese phonetics.

- 1) The lingual vowels *j*[tɕ], *q*[tɕ'], *x*[ç]

The error forms of the three consonants appear to be applied to each other.

- 2) The affricates: *zh*[tʂ], *c*[tʂ'], *z*[tʂ]

The error forms of Bangladeshi students are concentrated to be pronounced as *ch*[tʂ'], *z*[tʂ], *sh*[ʂ].

#### 5.1.2.2. Finals

- 1) The apical vowels -i[ɿ], -i[ɿ] are pronounced as lingual vowels *i*[i]

This becomes a difficult point for students to acquire Chinese finals at all stages.

- 2) Confusion arising from similar finals

Due to the interference of the knowledge of the target language, Bangladeshi students occurred this error form of confusion arising from similar finals, so *ei* was ranked at the second level and *ai* at the third level.

- 3) Postnasal finals are confused with each other or the tail vowels are lost

There is no nasal finals in Bengali like in Chinese, so when Bengali students acquire nasal finals, they tend to mix up similar nasal rhymes due to negative transfer of the target language. The three post-nasal finals *eng*, *ing*, and *ueng* have been lost with 39%, 45%, and 93% error rates, making them more difficult for Bangladeshi students to acquire.

#### 4) Improper mastery of [y-] finals

The average error rates of [y-] finals ü[y], üe[yɛ], ün[yn], and üan[yən] are all very high, 64%, 36%, 37%, and 38%, respectively.

#### 5) The curly final er[ər] is not curly enough

The final er[ər] is a special final in Chinese phonetics, and there is no corresponding rolled vowel in Bengali. When pronouncing er[ər], there is often an error form of not enough rolled tongue. er[ər] is a lingual central unrounded vowel, the “e” in er is in the middle of the tongue position, which is the “middle e”. When pronouncing “middle e”, the tongue is rolled at the same time, and the tip of the tongue touches the soft palate to complete the pronunciation of er. Bangladeshi students are aware of the tongue roll and the tongue roll action when pronouncing er, but the degree of tongue roll is often not enough, and the tip of the tongue only touches the front part of the hard palate, so it produces an error.

### **5.2. Teaching Measures for Improving Phonetic Acquisition**

#### *5.2.1. Teaching Measures for Improving Negative Transfer of Native Language*

##### 5.2.1.1. Teaching Measures for Improving Initial Acquisition

Since the two languages have the same phonetic symbols and the actual pronunciation is different, the first way to solve the problem is for the teacher to clearly tell the students the actual pronunciation of the same phonetic symbols in the two languages is different, so as to prevent students from confusing the pronunciation in the two languages, thus causing errors.

1) Non aspirated sounds b[p]、d[t]、g[k] and aspirated sounds p[p’]、t[t’]、k[k’]

When teaching these six initials, if teachers can explain the similarities and differences between the two languages clearly from the beginning and carry out a lot of reading practice, the error rate of students will be greatly reduced.

#### 2) Root of tongue h[x]

When Bangladeshi students pronounce h [x], they always pronounce the root tongue sound h [x] into the glottic sound h [H] in their mother tongue, and the pronunciation part is too backward. In view of this situation, the teacher needs to explain the pronunciation methods and differences of the two h clearly. And the h[x] pronunciation position in Chinese is relatively front, so the pronunciation is loud and can drag for a long time;

The pronunciation of H [H] in Bengali is relatively backward, and the voice is relatively low when pronouncing, so it cannot be dragged for a long time. Teachers can teach h from easy to difficult ha、 hai、 hen、 han and other syllables, and then teach hu、 hua、 huai and other syllables.

#### 3) Tongue curling ch[tʂ] And sh[ʂ]

When ch and sh are combined with the vowels at the tip of the tongue, the tip of the tongue is often tilted not in place, and the tongue leaf sound in the mother tongue is produced [tʃ] Or [dʒ]。 In view of this situation, it is the key to explain to the students the fundamental difference between CH and SH in the mother tongue and ch and sh in Chinese in the pronunciation part. When explaining, the teacher can use gestures to guide the students to retract and roll up the tongue, feel the hard palate with the tongue, and fully experience the "raised tongue" in the uneven and hard part behind the teeth Through gestures, students can understand the pronunciation characteristics of the back sound of the tip of the tongue, and know the position and degree to which the "upturned tongue" should be upturned, which is helpful for students to master the "upturned tongue" accurately and quickly.

##### 5.2.1.2. Teaching Measures for Improving Final Acquisition

#### 1) Single final e[ɤ]

When teaching, besides explaining the differences between the two, the teacher can also use the tongue diagram of vowel pronunciation to emphasize the key points of e[ɤ] to the students.

#### 2) Diphthong finals uo[uo], ua[ua]

The teacher should first explain to the students that there are no long vowels in Chinese like in Bengali, but only short vowels, and then explain the structure of the rhymes in Chinese Pinyin syllables, i.e., medial sound (also called head vowel), main vowel and tail vowel.

#### 3) Triphthongs finals iou[iəu], uei[uei]

When teaching these sounds, the teacher shall first tell students the actual pronunciation in Chinese. iou is pronounced by sliding quickly from i to o and closing with u, and uei is pronounced by sliding quickly from u to e and closing with i. Also, the teacher shall tell students that these two triphthongs finals are written iu and ui in syllables, but the pronunciation of the main vowel o and e cannot be omitted, which is different from iu and ui in Bengali. When the teacher finds that the vowels o and e are missing in the students’ pronunciation, he/she should also correct the sound in time to get the students’ attention.

### 5.2.2. Teaching Measures for Improving Negative Transfer of Target Language

#### 5.2.2.1. Teaching Measures for Improving Final Acquisition

##### 1) Lingual j[te], q[te'], x[ε]

To address the situation that Bangladeshi students are not familiar with the rules of Chinese pinyin and mistake the two-dotted ü spelled with j, q, and x for u, the occurrence of this error should be addressed at the source. It is crucial to let students understand and enhance their familiarity with the rules.

##### 2) Affricates zh[tʂ], z[ts], c[ts']

When Bangladeshi students acquire c, the forms of errors and the reasons for errors occurring are rather complicated, and different solutions should be applied for different forms of errors. For example, when Bangladeshi students pronounce the lingual pre-c as lingual lobe [tʃ], the teacher should emphasize that the pronunciation part is at the tip of the tongue, not the lobe; when Bangladeshi students pronounce the fricative c as fricative s, the teacher should emphasize the pronunciation method of both, one is the affricate and the other is the fricative; when Bangladeshi students pronounce the flat-tongue c as the retroflex ch and sh, the teacher should emphasize the different pronunciation methods of the flat-tongue and the retroflex.

#### 5.2.2.2. Teaching Measures for Improving Final Acquisition

##### 1) Simple finals -i[ɿ], -i[ɿ], i[i]

The key lies in students' mastery of the vowels zh, ch, sh, r, z, c, and s. The consonants zh, ch, sh, r, z, c, s are taught by using the whole recognition with the consonants zh, ch, sh, r, z, c, s.

##### 2) Compound finals ei[ei] and ie[iε], ou[əu] and uo[uo], iou[iəu] and uei[uei]

Training should be strengthened by using the behavior-stimulus teaching method, giving a large number of similar words, such as 豆荚(dòujiá) and 多少(duōshǎo), so that students can digest and consolidate them through various exercises such as repeated listening, imitation and recognition, and become long-time memory, thus enabling them to clearly identify the differences in pronunciation of such compound rhymes without further errors.

##### 3) Nasal finals ang[ɑŋ], eng[əŋ], ing[iŋ], ong[ɔŋ], uang[uɑŋ], ueng[uəŋ]

The lead-in practice is used to help Bangladeshi

students pronounce the back-nasal finals in full, that is, using the later syllables with the helper to facilitate the pronunciation of the preceding postnasal finals in place. When practicing, you can take advantage of the fact that the postnasal final -ng is pronounced in the same part of the tongue as the velar (g, k, h) and use the method of priming the back word against the front word, such as the words of 生活(shēnghuó), 钢管(gāngguǎn), 领口(lǐngkǒu), etc.

##### 4) [y-] finals ü, üe, ün, üan

Before teaching these three [y-] finals, let students whistle to find the tongue position of ü[y], fix it, and then add the following [ε], [n], [εn], then they can accurately produce üe[yε], ün[yn], and üan[yεn].

However, the rule of omitting two dots when spelling a [y-] final with the vowels j, q, and x still needs to be emphasized to students in order to avoid them from continuing to pronounce üe[yε], ün[yn], and üan[yεn] as [ue], [un], and [uan].

##### 5) Curly-tongued final er[ər]

Through the tongue position diagram, students know that the rolled tongue should be rolled to the soft palate, and then they can learn the rolled tongue correctly by letting them roll the tongue to the soft palate beforehand and then pronounce the rolled tongue sound. Besides, a lot of practice with syllables or words about er[ər] is essential.

### 5.2.3. Measures for Improving the Teaching of Bengali Chinese Phonetics

#### (1) Teachers should understand the cultural background of Bangladesh

On the one hand, Chinese teachers should respect their cultural characteristics, and on the other hand, they should emphasize the importance of acquiring accurate Chinese phonetics from the very beginning of Chinese teaching. In the teaching sessions of word reading and text reading, multimedia should be used as much as possible to show the students the most accurate sounds.

#### (2) Emphasis on guiding students' learning motivation

The author believes that besides emphasizing the importance of Chinese phonetics, more Bangladeshi students can be organized to attend local Chinese gatherings after class. When they communicate with Chinese people, they can have a better language environment, which can strengthen their interest in learning Chinese and at the same time have a certain context to improve their Chinese phonetics.

#### (3) Increasing the lesson time for phonetics learning

Teachers should realize the importance of phonetic

teaching, consciously increase the class hours of Chinese phonetic teaching, and never neglect the correction of students' wrong pronunciation in the future Chinese teaching. In each class, the teacher shall take 5 minutes to correct students' pronunciation, which can not only imply the importance of students' Chinese pronunciation, but also effectively correct students' wrong pronunciation.

#### (4) Chinese teachers shall learn Bengali

Bangladeshi students are greatly influenced by their mother tongue when acquiring Chinese phonetics. Therefore, if teachers who teach Chinese in Bangladesh can consciously improve their own quality, learn Bengali after school, study Bengali phonetics, grammar and vocabulary, and understand the causes of errors that occur in Bengali students' learning, they can teach according to students' error forms, which not only can effectively improve the teaching effect but also can prevent errors from occurring. By learning Bengali, teachers can also understand some Bengali culture, which will bring the relationship between teachers and students closer and make Chinese teaching better.

#### (5) Strengthening the teaching force of Chinese teachers

On the one hand, we should increase the number of Chinese teachers sent to Bangladesh, and on the other hand, we should actively train local Bengali Chinese teachers. The fundamental measure to meet the demand for Chinese language teaching in Bangladesh is to establish a perfect training mechanism for native Chinese teachers, to train Chinese teachers from Bangladesh itself, and to enable native teachers to go to China regularly to study Chinese phonetics and Chinese teaching, so as to improve their Chinese language and Chinese teaching level.

## 6. CONCLUSION

For those Chinese phonemes that are not found in Bengali but are more marked, the probability of phonological errors among Bengali students is very high, e.g. the average error rates for the finals *zh*, *c*, and *z* are 53%, 61%, and 71%, respectively, and the finals *üe*, *eng*, *üan*, *er*, *ing*, *ün*, *-i[ɿ]*, *ü*, *-i[ɿ]*, and *ueng* had an average bias rate of 36%, 39%, 37%, 42%, 45%, 48%, 56%, 64%, 78%, and 93%, respectively; followed by those phonemes that are identical or similar in Chinese and Bengali but slightly more marked in Chinese with a higher probability of errors, such as the finals *q*, *j*, *x*, *ch*, *s*, *r*, and *p* with an average error rate of 30%, 40%, 46%, 47%, 48%, and 44%, and the average error rates for the finals *uo*, *u*, *ia*, *iou*, and *uei* are 23%, 25%, 30%, 35%, and 35%, respectively; those phonemes that are different from Bengali but more common and not as highly marked as Bengali have relatively lower error rates, such as the vowels *d*, *b*, *g*, *h*, *t*, and *k* have average error

rates of 2%, 12%, 12%, 12%, 26%, and 29%, respectively, and the finals *an*, *iao*, *ian*, *en*, *ong*, *ang*, *ei*, *uen*, *ao*, *iiong*, *ou*, *iang*, and *uai* have an error rate of 1%, 1%, 4%, 2%, 3%, 4%, 7%, 7%, 15%, 13%, 14%, 20%, and 20%, respectively. Those phonemes that are present and more common in both Chinese and Bengali have extremely low and almost zero probability of errors, such as zero for initials *m*, *f*, *n*, and *l*, and zero for finals *a*, *o*, *i*, *in*, *uan*, and *uang*. This proves that the Markedness Differential Hypothesis is scientific and reliable for predicting the acquisition of Chinese initials and finals by Bangladeshi students. Based on the analysis of the error rate and the form of errors in the acquisition of Chinese phonology by Bangladeshi students, the author believes that the main source of error is the influence of negative transfer of native language. As the time of learning Chinese grows, while the knowledge of Chinese phonology is mastered but not firmly enough, the knowledge of Chinese phonology will have negative transfer to them. In addition, the cultural background of Bangladesh, students' learning motivation, teachers' phonetics curriculum, and the lack of teaching force may also affect the phonetic errors, so the author has proposed different teaching countermeasures for these factors in order to help improve the teaching of Chinese phonetics in Bangladesh.

## REFERENCES

### (A) Monographs, Proceedings, Dissertations

- [1] Jiang Yinlian. Identification of Difficulties in Learning Mandarin Chinese for Thai People [A]. Selected Papers of the Fifth International Symposium on Chinese Language Teaching [C]. Beijing:Peking University Press, 1997.630-634
- [2] Lai Cuiyun. Analysis of the Bias of Vietnamese Learning Chinese Phonetics and Teaching Strategies [D]. Tianjin: Tianjin University, 2007.
- [3] Tian Yuan. The Analysis of Chinese Tone Bias of Japanese Students and Teaching Tone to Japanese Students [D]. Tianjin: Tianjin Normal University, 2003.
- [4] He Tao. Analysis and Countermeasures of Chinese Pronunciation Bias of International Students from Russia and Central Asia [D]. Xinjiang:Xinjiang University, 2009.
- [5] Liu Xiaojun. Experimental Analysis of Chinese Pronunciation Bias among Vietnamese Students [D]. Guangxi:Master of Guangxi University, 2006.
- [6] Liu Shanshan. Experiment and Analysis of Tone Acoustics of Korean Students at Intermediate Chinese Proficiency[D]. Guangxi:Guangxi Normal University, 2008.

- [7] Wang Jianqin. Research on the acquisition of Chinese as a second language [M]. Beijing: Beijing Language and Culture University, 1997. 27-54
- [8] Muhammad. A comparison of Chinese and Arabic phonology [D]. Tianjin:Tianjin Normal University, 2009.
- [9] He Tao. Analysis and Countermeasures of Chinese Phonetic Bias among Russian and Central Asian Students [D]. Xinjiang:Xinjiang University, 2009.
- [10] Li Fangyan. A comparison of the acoustic features of Mandarin Chinese phonemes /u/ between native Chinese speakers and Japanese learners [D]. Beijing:Beijing Language and Culture University, 2009.
- [11] Guo Jinfu. Explanation and exploration of Chinese intonation [M]. Beijing: Beijing Language Institute Press, 1993.
- [4] Lu Jingsheng. A comparison of Chinese and Spanish phonetics-analysis of the phonological difficulties of learning each language as a foreign language[J]. Journal of Shanghai Foreign Language Institute, 1991(6):58-62.
- [5] Marlena Gibradze. A comparison of Chinese and Georgian phonetics - a preliminary study of teaching Chinese phonetics to Georgian students [J]. Journal of the College of Arts and Letters, Nanjing Normal University, 2002(4):132-139
- [6] Wang Lijuan. A Preliminary Study on Chinese Vowel Deviations among Nepalese Students in Gui [J]. Journal of Guangxi University (Philosophy and Social Science Edition), 2007.
- [7] Cui Xiaofei. An Analysis of the Difficulties of Pakistani Students in the Early Stage of Chinese Acquisition [J]. Language Teaching Research, 2008.6
- [8] Kuang Laying. Analysis of the bias of Chinese phonetic acquisition and teaching countermeasures among Filipino-Chinese students [J] Journal of Philology, 2008(10):167-169.
- [9] Wang Gongping. An experimental study on the bias of Chinese Mandarin bisyllabic upward continuous tone among Indonesian Chinese students[J]. School of Chinese Language and Culture, Jinan University, 2004.
- [10] Wen Baoying. A study on the acquisition of Chinese vowels by Japanese learners [J]. Journal of Yunnan College of Finance and Trade (Social Science Edition), 2008(4):62-69.
- [11] Wang Yunjia, Deng Dan. Japanese learners' acquisition of "similar vowels" and "unfamiliar vowels" in Mandarin Chinese[J]. World Chinese Language Teaching, 2009.23(2):262-277