

# Bilingual First Language Acquisition (BFLA): Evidence for Bangla-English Learning Bilingual Child's Phonological Development

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## Abstract

This article falls within the domain of “bilingual first language acquisition”. It discusses the early phonological development of a Bangla-English learning bilingual child at 12 months of age focusing on the occurrences of universal and language specific sound patterns found in the pre-linguistic and first word stage of infant vocalization. The co-occurrences of universal trends were indeed visible in the infants’ babbling in both language contexts, which is consistent with previous studies. However, since language specific patterns for Bangla and English were not substantial at this early stage, “language differentiation” had not taken place. Traces of mixed sound segments from the two languages provide evidence that it is possible for infants to develop sounds segments from two separate phonological systems simultaneously, that is, a child is able to acquire two first languages simultaneously, though the production level may not be homogeneous. This could be related to input factors. Though this research is an extraction from an ongoing longitudinal study, the findings are noteworthy as they provide data for developmental process at a given phase of language acquisition.

**Keywords:** Bilingual first language acquisition (BFLA), phonological development, universal and language specific sound patterns, language differentiation.

## Introduction

In this era of globalisation, infant bilingualism, involving more and more languages, especially Asian languages, is increasing, not only through mixed marriages, but predominantly via employment and settlement of the parents’ generation overseas. As such, ‘bilingual first language acquisition’ (BFLA) has become an intriguing as well as a crucial topic for research over the last few decades not only in the interdisciplinary field of child language research, but also in bilingual education itself.

There are claims that “bilingual and multilingual children are the majority not a minority” in today’s world; hence, it has become “a norm rather than the exception” (Wei, 2010, 8). With this view in hand, the current paper aims at discussing the preliminary findings and analysis of a bilingual infant’s phonological development at 12 months of age, focusing on the phoneme categories and syllable structure of both Bangla and English as his first two languages. Prior to the analysis of the data, the author offers a brief discussion on this widely experienced but less discussed phenomenon of BFLA, its theoretical background and some relevant cross-linguistic research findings.

## What is BFLA: A Definition

The theoretical implication of ‘bilingual first language acquisition’ (BFLA) is that when a child is exposed to two languages from early childhood or birth, both the languages are accentuated as ‘first’, and the developmental pathways of these languages are analogous to a monolingual acquiring his or her single first language (Wei, 2010). However, there could be qualitative differences in

terms of pace of development and influence or input. Two types of BFLA have also been documented. If a child is exposed to two languages more or less simultaneously from the first year of his or her life, it is referred to as ‘simultaneous bilingual first language acquisition’. Whereas, a child who has acquired minimal competence in the native language of his/her parents and then encounters a second language and receives regular exposure to it at an early age while he/she starts attending preschool, is referred to as ‘sequential bilingualism’ (McLaughlin, 1978; Yip and Matthews, 2007). The preliminary findings of the present study focus on simultaneous bilingualism.

### Theoretical Background

Previously bilingual acquisition was viewed as burdensome, which could strain the cerebral system leading to confusion and deficiencies in the acquisition of the two languages. Many parents also believe that exposure to dual language environment results in language delay (King and Fogle, 2006). However, research evidence shows that the human mind has the capacity to acquire and develop more than one language successfully without any deficiencies (Chirsheva, 2010; Yip and Matthews, 2007; Itani-Adams, 2007; Keshavarz, 2007; Kuang, 2007; Qi, 2004; Johnstone, 2004; Keshavarz and Ingram, 2002).

BFLA has a long history, yet established theories on bilingual acquisition have not surfaced, and thus it still relies on previous theories on first language acquisition in general. The earliest hypotheses in this field have evolved from the central theme based on the question much often asked, “do bilingual children have one undifferentiated linguistic system or two differentiated systems?” (Wei, 2007). Various reports on children’s mixing of elements from their two languages in their initial stage of language development have led earlier researchers such as Volterra and Taeschner (1978) to theorize that children start off with one linguistic system. This supposition became established as the ‘fused system hypothesis’ or the ‘unitary language system’.

Subsequent researchers such as Genesee (2001, 2007, and 2008) and Meisel (1989) refute this former claim based on methodological shortcomings, and argue that children are able to differentiate two languages from the earliest stages of bilingual development. This theory became documented as the “separate system hypothesis” or “dual system hypothesis. Genesee (2001) further states that children’s language mixing may vary across studies and is related to other factors such as input by parents and caregivers and is perhaps not due to a fused system. Up till now, most of the research in this area demonstrates that bilingual acquisition is characterized by some form of cross-linguistic influence. However, researches on these issues are limited and investigation still continues (Wei, 2007).

### Issues Related to BFLA

***Universal traits in first language acquisition.*** Research in child language acquisition shows evidence of common universal traits in infant’s pre-linguistic vocalization and first words across different languages (Kern and Davis, 2009; Kern, Davis, MacNeilage, Koçbas, Kuntay, & Zink, in press). These cross-linguistic commonalities in babbling and early speech demonstrate shared co-occurrence patterns in sound segment combinations. This is related to the physical maturation of the vocal tract at this early stage, whereby infants lack autonomous movement of all the active articulators, thus limiting to certain categories of sound segment combinations to emerge more frequently than others (MacNeilage, Davis, Kinney, & Matyear, 2000). In other words, infant’s vocalization is “bio-mechanically” controlled. There tends to be rhythmic patterns of consonant and vowel sound alternations, such as, coronal consonants followed by front vowels (e.g. “di”, “de” “dæ”), labial consonants followed by central vowels (e.g. “pa”, “pə”, “pɑ”) and dorsal consonants

followed by back vowels (e.g. “ku”, “kɔ”, “kɑ:”). The basic syllable structure produced at this phase tends to be the CV type open syllable, which is also the most basic syllable structure in the languages of the world. Among other early preferences in infant babbling and first words, there is evidence of considerably more stops, nasals and semivowel production than other consonants; more coronal and labials than dorsal consonants, and more mid and low front vowels, and central vowel production than other vowels (Kern et al., in press). These universal features have been found in both monolingual as well as bilingual studies. Kern and associates’ study (in press) concerned monolingual infants from 5 different language backgrounds - French, Tunisian, Romanian, Turkish and Dutch.

**Language specific characteristics.** Research also attests to the fact that infant’s articulation of sounds advances gradually from universal preference (language-independent) to native like preferences (language-specific), and evidence for both features has been reported in the babbling and early word stage of infants’ vocalization (Kern and Davis, 2009; Kern et al., in press). In bilingual cases, the emergence of language specific patterns in the child’s babbling provides verification for “language differentiation”. That means, infants prefer to produce sound patterns that are more frequent in their two native languages depending on the language contexts and the caregivers they are with (Maneva and Genesee, 2002; Johnstone 2004). Bilingual infants are eventually able to develop two sets of phonological properties of their two native languages. Besides, researchers support that input plays an important role in bilingualism and multilingualism (Werker, 2012).

**Input.** Since infants are able to process the linguistic properties of both their languages, it demonstrates that there is a close association between language input and language acquisition, (Pearson, Fernandez, Lewedeg, & Oller, 1997). However, individual variations in acquisition are also observed. Pertaining to these facts researchers take into consideration the varying possibilities of input, such as, home versus community language(s), language strategies employed by the interlocutors, and quality and quantity of input. Linguists still believe in the One-Parent-One-Language policy (OPOL) to bring up children as balanced bilinguals (Wei, 2010; Genesee and Nicoladis, 2005; Barron-Hauwaert, 2004). This means that one parent interacts in only one language with the child, and code-switching is limited. This strategy is common in mixed marriage cases, but can also be applied by bilingual parents from the same nationality. In multilingual and multiethnic countries like Malaysia, code switching is a common practice within the household, which is also reflected in children’s speech.

**Typology.** Another important variable in BFLA research is the “typology” (underlying structural properties) of the two languages that the child is acquiring. All languages share certain similarities as well as differ in other aspects of their structural makeup in both domains of morpho-syntax and phonology. For example, the basic syntactic structure of English is SVO (subject-verb-object), whereas in Bangla it is SOV (subject-object-verb). Certain phonetic segments in English are allophonic variations, while in Bangla it is phonemic, and so on. Analysing the various similarities and differences directs researchers to understand children’s language mixing (or cross-linguistic influence) which may occur, as well as other important variables related to the relationship of dual language acquisition.

### Methodological Concerns

Most of the research methods applied in BFLA are longitudinal single case studies which still remain as the principal method. Most of the investigations are also conducted by parent researchers who are linguists. Although there are concerns of parental biasness, literature review shows evidence of numerous case studies of this nature, and this type of case study is an accepted

norm due to its ethnographic technique of data collection in a naturalistic environment (e.g. Johnstone, 2004; Keshavarz and Ingram, 2002; Kuang, 2007; Qi, 2004; Volterra and Taeschner, 1978). In some cases 2 or 3 children are also studied. Although there are apprehensions and misunderstandings regarding the case study approach, there are also justifications and arguments in support of this methodology. According to Ruddin (2006, p. 798), “a case-study is an in-depth study of the particular, where the researcher seeks to increase his or her understanding of the phenomenon studied”, which is analysed intensely and explored without manipulation. Single case studies can also be replicated with different subjects, which is often difficult to perform in large-group studies. By this technique the researchers verify the generalizability of the findings (Morgan and Morgan, 2009). Although longitudinal case studies are time consuming, comprising of 2-3 or more years of ongoing data collection, requiring systematic observation, note taking and coding, as well as patience, it is a valid and appropriate method that suits the phenomenon of BFLA, and helps to understand the developmental patterns of the child’s language acquisition over a long period of time. In this regard, Wei (2010, p. 7) states, “one of the clear strengths of single-case studies is the depth of observation by the researcher of the child’s development over time. The quality of the data is usually very high.”

Studies on phonological acquisition can be either impressionistic or experimental, or a combination of both categories. Conventional impressionistic studies (the longitudinal case study method, as discussed above), are based on observational and perceptual methods using orthographic or phonetic transcription and are useful in providing information on a child’s gradual development over a longer period of time. They are also useful in understanding individual differences in children’s phonological acquisition. With the advancement of technology, phonological investigation has also led to more experimental designs to be carried out, either in the home setting or in the language laboratory. Laboratory procedures can be performed on larger samples and allows researchers to explore children’s linguistic capacity under more controlled conditions at a given point in time. It allows data to be examined from a more acoustic perspective (Demuth and Song, 2012). Experimental designs can also provide evidence for understanding what a child “can do” contrary to what they “actually do” (Wei, 2010).

### **Significance of the Study**

Scholarly investigations on bilingual first language acquisition (BFLA) comprising Bangla as one of the target languages have been substantially understudied. There is also a lack of empirical research on the phonological acquisition of Bangla and English as a child’s first two languages. This study provides an insight into some of the key issues discussed above by exploring the preliminary findings of a Bangladeshi child’s simultaneous acquisition of Bangla and English as his first two languages focusing on the early phonological developmental patterns acquired at 12 months of age. Thus it will no doubt contribute to the field of BFLA research.

### **Scope of the Study**

Since it will be too broad and exhaustive to explore all the phonetic and phonological features of the two languages, this paper will centre upon the inspection of one month’s data collection focusing on the analysis of consonant and vowel sound segments, syllabic utterances and segmental combinations that were acquired by the subject in his pre-linguistic vocalization and first words after his first birthday. A brief summary of the similarities and differences between Bangla and English phonology, relevant for this research, have also been discussed. The data discussed in this paper is an extraction from an extended ongoing longitudinal single case study involving the same subject.

## The Rationale for the Current Study

The rationale for focusing on one month of data obtained at 12 months is based on previous research, which suggests that infant's articulation of sounds advances gradually from universal preference to native like language preferences, and evidence for both features have been found in the babbling and early word stage of infants' vocalization (MacNeilage et al., 2000; Kern and Davis, 2009; Kern et al., in press). Studies in bilingual situations (BFLA) have also shown evidence for these universal and native language structures as well as "language differentiation" during the pre-lexical stage (Maneva and Genese, 2002; Johnstone, 2004). Yet other investigations in dual language acquisition have been reported to finding no significant differentiation in babbling irrespective of the language contexts (Poulin-Dubis and Goodz, 2001). Thus, centring upon these findings, it is predicted that at 12 months of age there will be traces of both universal preferences and native like preferences of Bangla and English phonological productions, and language differentiation may or may not be so perceptibly significant.

## Research Objectives

The objective of this investigation is to scrutinize the prevocalic sounds and first words that were acquired by the subject at 12 months, with the following goals in mind:

1. To test the common features that are universal across different languages
2. To examine native language features in both Bangla and English contexts, which would provide evidence for language differentiation
3. To explore the characteristics of the cross-linguistic utterances (mixed sound segments) that may be visible in the data

The first research objective concerning universal characteristics can be segmented in the following way:

It is predicted that there will be –

- A. a greater quantity of CV type open syllables in relation to other types of syllables.
- B. considerably more stops, nasal and semivowels than other consonants.
- C. more coronal and labials than dorsal consonants.
- D. more mid and low front vowels, and central vowels than other vowels.
- E. Preference for consonant-vowel combination patterns in the syllabic utterances, which will have the following traits:

Coronal consonants + front vowels

Labial consonants + central vowels

Dorsal consonants + back vowels

## Contrastive Analysis of Bangla and English Phonological Structures

From a typological perspective standard Bangla and English both have similarities as well as differences in many aspects of their phonemic inventories, and phonotactic constraints. Standard Bangla (SB) and Standard British English (SBE) were the two accentual varieties of input that the subject received on a daily basis from his caregivers.

### Inventory of Bangla and English Consonants

Tables 1 and 2 illustrate the consonant phonemes of the standard varieties of Bangla (SB) and English (SBE) respectively following the standardized IPA method symbols. As can be observed, SBE consists of 24 consonant phonemes, while SB has a total of 32. The glottal stop [ʔ] has also been included in the SBE table, which can be considered as an allophonic variation of the [t] phoneme. Some diversities were found pertaining to some of the phoneme categories in the Coronal group of SB in different resource books. Thus to simplify, the phoneme categories that were actually produced by the interlocutors and the subject and used in the data transcription, were the ones that have been displayed in the Table (2). For further enquiry please refer to Chatterji (1996), Morshed (1997), Huq (2007) and Binoy (2009).

**Table 1: Standard British English Consonant Phonemes**

	Labial		Coronal				Dorsal	Laryngeal
	Bilabial	Labio-dental	Dental	Alveolar	Palato-alveolar	Palatal	Velar	Glottal
Plosives/stop	p b			t d			k g	(ʔ)
Fricatives		f v	θ ð	s z	ʃ ʒ			h
Affricate					tʃ dʒ			
Nasal	m			n			ŋ	
Lateral Approximant				l				
Central Approximant	w				ɹ	j		

**Table 2: Standard Bangla Consonant Phonemes**

	Labial	Coronal					Dorsal	Laryngeal
	Bilabial	Dental	Alveolar	Palato-alveolar	Retroflex	Palatal	Velar	Glottal
Unaspirated Plosives	p b	ʈ ɖ		c ɟ	t d		k g	
Aspirated Plosives	p <sup>h</sup> b <sup>h</sup>	ʈ <sup>h</sup> ɖ <sup>h</sup>		c <sup>h</sup> ɟ <sup>h</sup>	t <sup>h</sup> d <sup>h</sup>		k <sup>h</sup> g <sup>h</sup>	
Fricatives			s	ʃ				h
Nasals	m	*(ɳ)	n				ŋ	
Lateral Approximant			l					
Tap/Flap					ɽ			
Approximant	w			ɹ		y		

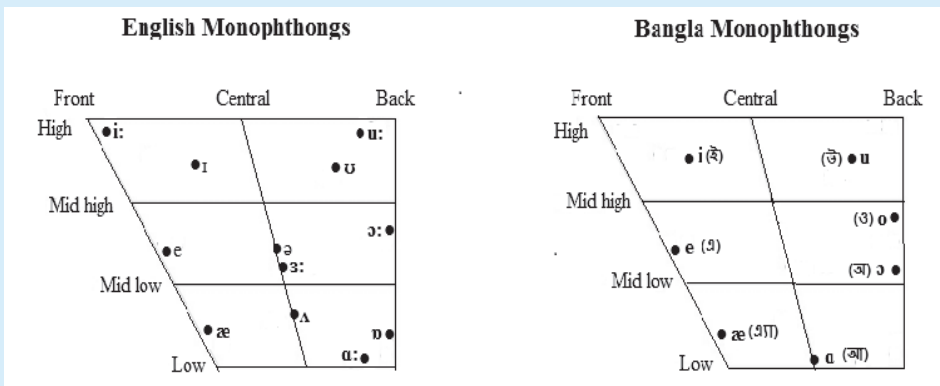
\*less frequency of occurrence

English and Bangla Vowels

**Monophthongs.** Monophthongs are vowels with a single vowel quality which remains more or less steady and are demonstrated with a single IPA vowel symbol. Standard British English (SBE) has a larger variety of monophthongs - 7 short vowels, including the “schwa” [ə], which is the shortest vowel in the vowel system, and 5 long vowels (Roach, 2000, Carr, 1999). Vowel length in SBE is an important feature as it can form minimal pairs, e.g. “sit” [sɪ t] and “seat” [si:t], “pull” [pʊ l] and “pool” [pu:l] and so on. Bangla has a total of 7 monophthongs and vowel length is not a salient feature in this language. But as a rule, all the Bangla vowels can be nasalised. English and Bangla monophthongs have been presented in the trapeziums (Chart 1) below.

**Diphthongs and Triphthongs.** Diphthongs and triphthongs also exist in both the languages. These vowels involve a movement or glide from one vowel quality to another (diphthongs) and then to another (triphthongs) within the same syllable, and treated as a “single unit of sound”, that is, a single phoneme (V). Thus a consonant followed by a diphthong or triphthong is considered as a single syllable. Some examples of Bangla diphthongs are - [nɔ i] (nine), [lɑ u] (pumpkin) etc. and triphthongs – [kʰɑoɑ] (to eat), [ɖɔiɑ] (pity) etc. For further discussion on SB vowel categories please refer to Chatterji (1996), Binoy (2009) and Kar (2009).

Chart 1: English and Bangla Monophthongs



Syllable Structure

The syllable is a phonological unit that helps to define a number of phonological properties of a particular language. The constituency of a syllabic structure comprises of a nucleus or peak (a vowel phoneme), which is obligatory, and onset(s) and coda(s) (consonant phonemes), which are optional, appearing before and after the vowel. No syllable can be formed without a nucleus; it is the core of a syllable. The number of onsets and codas in a syllable is confined to the phonotactic constraints of that particular language. The CV syllable (consonant followed by a vowel) is considered to be the most basic syllable structure in the languages of the world. It is also the syllable type that infants’ first produce in their babbling and early word stage (Carr, 1999). A syllable without a coda(s) is called an “open syllable”, while a syllable with at least one coda or more are called “closed syllables”, e.g. – V, CV, CCV, CCCV are open syllables, while VC, CVC, CVCC, CCVCCC and so on are closed syllables.

The syllable structure of SBE is quite flexible. English phonotactics allow monosyllabic words to have the following syllable structures, from a single V phoneme (e.g. “eye” [aɪ]) to VC, CV, CVC, and permitting up to CCC type consonant clusters to be present in both onset and coda positions, e.g. “spring” - [spɹɪŋ] - CCCVC, and “friends” - [fɹɛndz] - CCVCCC; and up to CCCC is allowed in some coda position, e.g. “sixths” [sɪksθs] - CVCCCC.

Bangla syllable structure is also quite flexible as compared to many other languages. Similar to English, Bangla words can have the following syllable structures, from a single V, to VC, CV and CVC, and allowing up to CCC in onset position, e.g. [sʈɪɪ] (wife) - CCCV. Some foreign words can also have CC in coda positions, e.g. the second syllable in the word “airport” [eaɪ .pɔɪ t] – VC-CVCC (Thompson, 2010).

## Methodology

**Study design.** The present investigation is a single case study, comprising of one month of data collection. The research procedure is solely impressionistic based on observation and perception of the informant’s phonological development of both the languages. As discussed earlier, this method is valid and appropriate, which has been employed in numerous studies in BFLA.

**The subject and his linguistic environment.** The present study focuses on the natural phonological development of one healthy normal infant boy with no hearing disabilities (addressed as M in this study), born in Malaysia to Bangladeshi parents and raised in Malaysia since birth. M is the second born child and has one elder sibling, a brother who is 8 years his senior. M was exposed to both Bangla and English from birth in a natural home environment. His parents followed the One Parent One Language (OPOL) policy at home to bring up the children as bilinguals, which is a common trait in bilingual cases. That means, when they spoke to M (as well as the elder sibling) they interacted in one specified language. Although both the parents are Bangladeshi nationals, they decided to follow the OPOL policy due to the multicultural and multilingual environment in Malaysia where English is only one of the community languages and stated as a second language under the government constitution. Malaysia also has different schooling systems, both national and national-type schools, whereby different languages are used in the primary sections, unlike native English speaking countries. Thus adhering to the OPOL policy and using English at home as one of the languages in Malaysia deemed appropriate and natural for educational as well as communicational purposes.

The informant received regular Bangla input from his father and English input from his mother, which can be considered standard in terms of pronunciation and grammar (near-native like) due to her acquisition of English in Britain during her school years and retaining the language ever since. The mother also utilized certain Bangla kinship terms with the child, such as “Nani”, “Dadi” for grandmother, “Bhiah” for brother and “Baba” for father, since it appeared to be more close and natural in terms of relationship. However, when the parents communicated with each other, in front of the child, they spoke in Bangla most of the time, code-switching in English time-to-time. The subject also received Bangla input from his maternal grandmother and one aunt. The grandmother played an important role as a caregiver during the time of data collection for this investigation.

## Data Collection - Transcription and Analysis

This study comprises of one month of data collection when M reached his first birthday. Audio recording and note taking were the two main sources of data collection. Data was compiled in two sessions (2 weeks interval), each session comprising of 2 parts; part 1 with Bangla speaking caregivers (father and grandmother, Bangla context), and part 2 with English speaking caregiver (mother, English context). Session one consisted of 4 recordings, 2 recordings within the Bangla speaking context (part 1), and 2 recordings within the English speaking context (part 2). All the recordings were held between intervals of one to two days, however, within the same week. Session two comprised of 2 recordings, one in each language context (part 1 and 2), held on the same day.



Thus, 6 recordings were conducted in total, 3 recordings for part 1, and 3 recordings for part 2. All the recordings were conducted at home in a naturalistic setting during interplay or feeding time. One recording with the grandmother was conducted at her home.

M's vocalization, which included babbling and first two words, was transcribed using the phonetic transcription, placing diacritic signs wherever necessary for analysis and discussion. Cries and groans were omitted from the analysis. Sounds regarded as a single utterance consisted of a stream of sounds (babbling or a word or words), and separated by half a second of pause before the onset of the next utterance. The results discussed here focus on the following patterns in the child's vocalization –

- occurrences of monosyllabic, bisyllabic and polysyllabic (more than two syllables) utterances,
- occurrences of phoneme combinations,
- occurrences of phoneme categories in both languages.

### Results and Discussion

At 12 months of age M's recording of sounds consisted of variegated or non-reduplicated babbling with some instances of reduplicated babbling. He was clearly in the stage of variegated babbling, but the intonation contour or prosody was absent. His production of sounds consisted of a variety of consonant and vowel combinations forming all the three types of syllabic patterns: monosyllabic, bisyllabic and polysyllabic in both Bangla and English speaking environments. M had acquired two adult like words at this stage, "aita" and "Allah". He learnt "Allah" from his grandmother since the "Ajan" (summon for prayer) was clearly heard from her house. The term "aita" had different connotations, which was actually the first lexical item that he had acquired. In some instances it had an interrogative implication meaning "What is it?" or "What is this?" as he pointed to something or while his caregivers were showing something. The questions often had a rising tone. At other times it was implied as a demonstrative determiner, "That one" or "This one" as he wanted something, sometimes pointing to an object.

Both the words are bisyllabic. There were also variations of vowel sounds in both the words, such as mid vowel (first syllable) – [e.lah], [e.ta], or low vowels – [a.lah], [a.ta], [æ:.tæ], or a variety of diphthongs (first syllable) – [[ei.ta], [ai.ta], [oi.tə:].

Syllabic utterances as well as utterances that consisted of only consonants were taken into account. Consonantal utterances largely consisted of the nasal [m] phoneme. Table 3 illustrates the total number of utterances as well as syllabic utterance types produced in both Bangla and English contexts. As can be observed, M produced more syllabic utterances in the English language environment than in the Bangla environment. However, the occurrence pattern is consistent, that is, bisyllabic utterances topped the most in both contexts, followed by monosyllabic and then polysyllabic utterances. In Maneva and Genesee's (2002) study conducted on a French-English learning infant of the same age as M, the results reveal that though the infant produced more monosyllabic utterances than bisyllabic ones in both settings, his total production of bisyllabic utterances in the English speaking environment outnumbered his production of bisyllabic ones in the French speaking environment. This evidence shows that infants produce more bisyllabic utterances in the English speaking context than other environments. However, more tests need to be conducted on Bangla-English learning infants to verify the consistency of this result.

Table 3: Utterances and Syllabic Utterance Types

	Total no. of Utterances	Total Syllabic Utterances	Monosyllabic	Bisyllabic	Polysyllabic
English	236	211	61	116	34
Bangla	206	138	38	68	32
Total	442	349	99	184	66

Among the different syllable types, the syllable structures were limited to - V, CV, VC, CVC, and a few instances of CCCV types, which consisted of nasals and the glottal [h], e.g [mhnə]. In both the contexts there was a greater quantity of open syllables among which the CV type open syllables outnumbered all other types of syllable structures. This is a universal trait found in other monolingual (Kern et.al., in press; Oller and Eilers, 1982) and bilingual studies (Maneva and Genesee, 2002) involving infants of similar age in different language environments.

M produced different types of consonant sounds – oral stops, nasals, semi-vowels, liquids, the glottal fricative [h], and a few instances of the glottal stop [ʔ]. Oral stops were the most frequent, followed by nasals, which also includes the non-syllabic nasal [m] occurrences. This was followed by semi-vowels, then liquids [l] and [ɹ]. The frequency of the glottal fricative [h] was similar to the frequency of the liquids; however, it was less than the semi-vowels. The frequencies of these occurrences were observed in both language contexts, which reflect universal preferences found across different language environments.

In terms of place of articulation, the occurrences of coronal consonants were the most prominent category, which consisted of alveolar and dental sounds in both language environments. This was followed by labials, consisting of only bilabials and no labio-dental sounds. The dorsal consonants were the least frequent in both the language settings, consisting of velar sounds. These results again reveal universal preferences in infant vocalization in babbling. However, it was also observed that there were more occurrences of glottalic or laryngeal sounds [h] and [ʔ] than the dorsals, but they were less frequent than the coronal and labials.

In terms of vowel occurrences, there was a high frequency of front vowels among which the mid and low front vowels [e] and [æ] were the most prominent. M also produced a large number of another category of a low front vowel - [a], which can be described as a sound that occurs in between the English low front vowel [æ] and the Bangla low central vowel [a]. It is similar to the vowel quality that exists in the English diphthong [aɪ] as in “buy” [baɪ], but not exactly approximating the Bangla vowel [a] as in “amar” [ɑmɑɪ] (mine). Similar to Kern and associates’ study (2009) where infants from five different language speaking environments were investigated, M in this survey also produced more mid and low front, and mid and low central vowels as compared to other vowels in both language environments. Nonetheless, M’s production also comprised of a large number of back vowels which is inconsistent with Kern et. al.s (2009) findings. This could be due to the language input. SBE contains more back vowels than SB, and M produced a higher quantity of back vowels in the English speaking environment.

Among the consonant-vowel combination patterns in the syllabic utterances, as predicted, there were more correct instances of coronal consonants with front vowels. This further provides evidence for universal preference in different language contexts. But the other consonant vowel combinations, for example, labials with central vowels and dorsals with back vowels, were infrequent. M produced more front vowels with these consonant varieties. Most of the labials with central vowels consisted of the bilabial semi-vowel [w] with the Bangla central vowel [a].

Pertaining to the topic of language specific patterns, the results demonstrate M’s production of syllabic utterances in the English speaking environment was higher as compared to the Bangla

speaking environment. Due to the higher syllabic load, it could be that M's production in each type of syllabic utterances (monosyllabic, bisyllabic and polysyllabic) was also higher in the English setting (see Table 3). Moreover, M's production of syllables containing a "stop/plosive" phoneme followed by a vowel was much higher in the English context than the Bangla context. He produced the Bangla oral stops in both the language environments (discussed below). Although these results are similar to Maneva and Genesee's study (2002) on the English-French learning infant whose production also showed a higher proportion of bisyllabic utterances and the stop + vowel syllables in the English speaking context, there is still a need for more empirical studies to be conducted not only on bilingual cases of Bangla-English learning infants' phonological development, but also on monolingual cases of infants' phonological acquisition in Bangla. In fact, at this stage in M's phonological development, it is difficult to find substantial evidence to claim for "language differentiation".

There is clear evidence in the data for mixed production of sound segments. M's production of oral stops in both language contexts outnumbered all other categories of consonant phonemes, and amongst them the Bangla stops were the most frequently occurring sound production. Bangla consists of a much larger variety of oral stops in its phonemic inventory, and although M was constantly receiving these kinds of input from his Bangla speaking caregivers (father and grandmother), he produced the Bangla oral stops in both the language environments constantly in syllable initial position. The stop phonemes that he uttered were the Bangla dental [t̪] and [d̪], and also [b], [g] and [d] phonemes which exist in both the languages, and the unaspirated [t], [k] and [p], which are separate phonemes in Bangla, but allophonic variations in English. Below is given a list of these categories in terms of frequency of occurrence.

**Table 4: Occurrence of Stop phonemes**

More frequent	t, t̪, d, d̪
Less frequent	b, k, p, g
Rare occurrences	d, k <sup>h</sup>

English has aspirated initial stop phonemes [p<sup>h</sup>, t<sup>h</sup>, k<sup>h</sup>]. They occur only in syllable initial/onset position, while the unaspirated versions are allophonic variations, which do not appear in initial position. But Bangla has a set of both aspirated and unaspirated stop phonemes which can occur in onset position. Data shows that M's production of these stops were always unaspirated (except for 2 occurrences) in syllable initial position irrespective of the language contexts. These results have been reported in a number of other studies. Oller and Eiler's (1982) analysis on Spanish and English learning infants have demonstrated a preference for unaspirated initial stop consonants. An earlier study conducted by Oller, Wieman, Doyle, & Ross (1975) on monolingual infants' phonological development in an English speaking environment shows similar results. Oller and Warren (as cited in Oller et al., 1975, p. 6) have also reported comparable outcomes of unaspirated stops in word-initial position. These results provide strong support for universal preferences in infant babbling of unaspirated stop phonemes over aspirated ones found not only in English speaking environment but also across different language communities.

Among the nasal stop production in both language contexts, [m] and [n] were more frequent than [ŋ], which was rare. All these nasal sounds are common in both the languages. M did not produce any fricative sounds at all in any of the language settings, except for the glottal [h]. This is in accordance with the milestones of phonemic production at this age. Although liquids such as [l] and [ɹ] are acquired at a later stage among English learning infants, M had produced these segments at 12 months of age, though not so frequently. [l] was more apparent than [ɹ], with a higher frequency load in the Bangla setting. This could be triggered by the input factor, as the grandmother often pronounced the term "Allah" with the child. Both of these phonemes appear in the inventories of both SBE and SB.

A mixed variety of vowel segments were apparent in M's linguistic repertoire in both language environments. Amongst the most frequent were the mid and low front vowels [e], [æ] and [a] (present in both contexts), and the Bangla central vowel [ɑ]. There were also traces of a number of back vowels which are common in both the languages.

The two lexical items "aita" and "Allah" that M had acquired at 12 months of age appeared in both language contexts, despite the fact that "aita" is a Bangla word and that the mother never applied it while interaction with the child in English. However, she did respond to the term by answering the question or performing to the child's needs. The father utilized it quite often while interacting in Bangla. These input factors could have prompted the child to produce the term recurrently in both contexts. These data provide evidence for cross-linguistic utterance in M's pre-linguistic vocalization.

### Conclusion

The preliminary findings of this research have yielded some insight into the acquisition stage of a Bangla-English learning bilingual child's phonological development at 12 months of age. Traces of universal features were visible in the data, which contribute further to support the common trends found across different language situations. The results that were contradictory to the predictions for universal preferences can only be evinced by further investigation of the corresponding language combinations (on children's acquisition of Bangla and English as their first two languages). Inconsistency of the use of language specific features found in the child's vocalization in the two contexts suffices to conclude that, language differentiation was not apparently visible at this early stage of phonological development. That is to say, the child did not babble differently in the two language environments by 12 months. In fact, fusion of phonetic and phonological elements from both the languages was evident in the data, with a higher proportion of the Bangla stop phonemes, and the common elements of both the languages.

These results cannot be generalized to conclude that all Bangla-English learning bilingual child of equivalent age will show a similar acquisition trail in their phonological development. Moreover, the presentation of these findings is also at its preliminary stage. However, it can be inferred from these discussions that it is possible for a child to develop sound segments and structures from two separate phonological systems simultaneously given that they receive input systematically. It also provides evidence for developmental process at a certain stage of phonological acquisition. Thus, this survey has to some extent enhanced our general understanding of the phenomenon of BFLA in different language combinations. More empirical research on both infant monolingual and bilingual cases need to be conducted involving Bangla as one of the target languages, so that cross-linguistic comparisons of phonological development can be drawn.

### References

- Barron-Hauwaert (2004). *Language Strategies for Bilingual Families: the one-parent-one-language-approach*. UK: Cromwell Press Ltd.
- Binoy, B. (2009). A contrastive analysis of English and Bangla phonemics. *The Dhaka University Journal of Linguistics*, 2(4), 19-42.
- Carr, P. (1999). *English Phonetics and phonology: An Introduction*. UK: Blackwell publishing.
- Chatterji, S. K. (1939/ 1996). *Bhasha-Prakash Bangala Vyakaran*. Calcutta: Rupa. First published by the Calcutta University Press.
- Chirsheva, G. (2010). Self-interpreting by bilingual children. *Sovremena Lingvistika*, 36(70), 173-193.

- Demuth, K. and Song, J. Y. (2012). How Phonological Representations Develop During First-language Acquisition. In A.C. Cohn, C. Fougeron & M.K. Huffman (Eds.), *The Oxford handbook of laboratory phonology* (pp. 397-406). OUP: London.
- Genesee, F. (2001). Bilingual first language acquisition: Exploring the limits of the language faculty, *Annual Review of Applied Linguistics*, 21, 153-168.
- Genesee, F. (2007). Early bilingual language development: one language or two? In L. Wei (Ed.), *The Bilingual Reader* (pp. 320-335). Oxford: Routledge.
- Genesee, F. (2008). Bilingual first language acquisition: evidence from Montreal, *Diversité urbaine*, numéro hors série, 9-26.
- Genesee, F., & Nicoladis, E. (2005). Bilingual acquisition. In E. Hoff & M. Shatz (Eds.), *Handbook of Language Development* (pp. 324-342). Oxford, England: Blackwell.
- Huq, M. D. (2007). *Bhasha Bigganer Katha* (Facts about Linguistics). Dhaka: Mowla Brothers.
- Itani-Adams, Y. (2007). *One Child, Two Languages: Bilingual First Language Acquisition in Japanese and English* (Unpublished doctoral dissertation), University of Western Sydney, Australia.
- Johnstone, N. (2004). Babbling in Bilingual Infants: Is There Evidence of Code Switching? *Symposium Proceedings: BilingLatAm*. 152-164.
- Kar, S. (2009). *The syllable structure of Bangla in Optimality Theory and its application to the analysis of verbal inflectional paradigms in Distributional Morphology*. (Unpublished doctoral dissertation, Universität Tübingen Germany). Retrieved from <https://publikationen.uni-tuebingen.de/xmlui/handle/10900/46376>
- Kern, S. and Davis, B. (2009). Emergent complexity in early vocal acquisition: Cross-linguistic comparisons of canonical babbling. In Chitoran, I. Coupé, C., Marsico, E. & Pellegrino, F. *Approaches to Phonological Complexity*, Phonology and Phonetics Series, Berlin: Mouton de Gruyter. 353-376.
- Kern, S. Davis, B., MacNeilage, P., Koçbas, D., Kuntay, A. & Zink, I. (in press). Cross-linguistic similarities and differences in babbling: Phylogenetic implications. In J.M. Hombert (Ed), *Towards the origins of language and languages*.
- Keshavarz, M. H. (2007). Morphological Development in the Speech of a Persian-English Bilingual Child. *Journal of Psycholinguistic Research*, 36(4), 255-272.
- Keshavarz, M. H., and Ingram, D. (2002). The early development of a Farsi-English bilingual child. *International Journal of Bilingualism*, 6(3), 255-269.
- King, K. and Fogle, L. (2006). Raising Bilingual Children: Common Parental Concerns and Current Research. *Cal Digest*. Retrieved from [www.cal.org/resources/digest/raising-bilingual-children.html](http://www.cal.org/resources/digest/raising-bilingual-children.html).
- Kuang, C. H. (2007). Simultaneous Acquisition of Mandarin and English: A Case Study (Unpublished doctoral dissertation), University of Malaya, Malaysia.
- MacNeilage, P. F., Davis, B., Kinney, A., and Matyear, C. L. (2000). The Motor Core of Speech: A Comparison of Serial Organization Patterns in Infants and Languages. *Child Development*, 71(1), 153-163.

- Maneva, B., and Genesee, F. (2002). Bilingual babbling: Evidence for language differentiation in bilingual first language acquisition. In S. Fish & A. H-J Do (Eds), *Proceedings of the 26th Boston University Conference on Language Development* (pp. 383-392). Somerville, MA: Cascadilla Press.
- McLaughlin, B. (1978). *Second-Language Acquisition in Childhood*. Hillsdale, NJ: Erlbaum.
- Meisel, J. (1989). Early differentiation of languages in bilingual children. In K. Hyltenstam & L. Obler (Eds.), *Bilingualism across the lifespan: In health and pathology* (pp. 13-40). Cambridge: Cambridge University Press.
- Morgan, D. L., and Morgan, R. K. (2009). *Single - Case Research Methods for the Behavioral Health Sciences*. Sage publications: London.
- Morshed, A. K. M. (1997). *Adbunik Bhasatatto* (Modern Linguistics). Calcutta: Naya Uduog Publishers.
- Oller, D. K. and Eilers, R. E. (1982). Similarities of babbling in Spanish – and English – learning babies. *Journal of Child Language*, 9, 565-577.
- Oller, D. K., Wieman, L. A., Doyle, W. J., and Ross, C. (1975). Infant babbling and Speech. *Journal of Child Language*, 3, 1-11.
- Pearson, B. Z., Fernandez, S. C., Lewedeg, V., and Oller, K. (1997). The relation of input factors to lexical learning by bilingual infants. *Applied Psycholinguistics*, 18, 41-58.
- Poulin-Dubis, D. and Goodz, N. (2001). Language Differentiation in bilingual infants: Evidence from babbling. In J. Cenoz and F. Genesee (Eds.), *Trends in Bilingual Acquisition Research* (pp. 95-106). Amsterdam: John Benjamins.
- Qi, R. (2004). *From nominal reference to the acquisition of personal pronouns in a Mandarin-English bilingual child* (Unpublished doctoral dissertation), University of Western Sydney, Australia.
- Roach, P. (2000). *English Phonetics and Phonology: A Practical Course* (3<sup>rd</sup> edition). UK: Cambridge University Press.
- Ruddin, L. P. (2006). You Can Generalize Stupid! Social Scientists, Bent Flyvbjerg, and Case Study Methodology, *Qualitative Inquiry*, 12(4), 797-812.
- Thompson, H.R., (2010). *Bengali A Comprehensive Grammar*. Abingdon: Routledge.
- Volterra, V. & Taeschner, T. (1978). The acquisition and development of language by bilingual children. *Journal of Child Language*, 5, 311-326.
- Wei, L. (2007). Introduction to Part Two. In L. Wei (Ed.), *The Bilingual Reader* (pp. 207-209). Oxford: Routledge.
- Wei, L. (2010). BAMFLA: Issues, methods and directions. *International Journal of Bilingualism*, 14(1), 3-9.
- Werker, J. (2012). Perceptual foundations of bilingual acquisition in infancy. *Annals of the New York academy of sciences*, 1251, 50-61.
- Yip, V. and Matthews, S. (2007). *The Bilingual Child: Early Development and Language Contact*. United Kingdom: Cambridge University Press.