

PHONOLOGICAL DEVELOPMENT OF A BILINGUAL CHILD DURING EARLY MEANINGFUL SPEECH PERIOD

Mohammad Hossein Keshavarz

Teacher Training University

Abstract

The purpose of this paper is to provide a descriptive account of phonological development in the speech of a Farsi-English bilingual child during the single-word production period, i.e., from 9 to 15 months of age. Data presented here is part of a longitudinal research conducted by the author. The record, thus, is representative of the language behavior of the subject over time. To the author's best knowledge, data on the phonological development of a Farsi-English bilingual child has not been published before. Therefore, this report may be of interest and value to researchers in the field child language acquisition in general and bilingual first language acquisition in particular.

Introduction

One of the salient characteristics of child language acquisition is phonological development, i.e., the immediately obvious aspect of speech. In fact, many early studies in CLA have focused on the acquisition of phonology by young children (Velten, 1943; Leopold, 1947; Jacobson, 1941/68; Stampe, 1969; Menn, 1971; Waterson, 1971; Kornfeld, 1971; Smith, 1973; Ingram, 1974, 1979; Carter, 1975; Ferguson and Farwell, 1975; Kiparsky and Menn, 1977). This marked interest in child's acquisition of phonology has continued throughout the 1980's and 1990's (Gusmann, 1980; Macken and Barton, 1980; Menn 1980, 1983; Schwartz and Leonard, 1982; Mackain, 1982; Nolan, 1982; Atkinson, 1982; Watson,

1983; Braine, 1984; Stoel-Gammon and Cooper, 1984; Ingram, 1985; 1988; 1990; Mann, 1985; Ohde, 1985; Pye, Ingram and List, 1987; Ratner, 1994 and references cited there).

Unfortunately, despite great interest in child-language acquisition in different languages of the world only three case studies have been reported on the acquisition of Farsi (Ashrafi, 1993; Rashtchi, 1999, and Fahim 1996) and there are imitations in these three studies. The first is an MA thesis focusing exclusively on the acquisition of interrogation by a Farsi-speaking child; the second is based on a Ph.D. research on the grammatical development of a monolingual Farsi-speaking child. Only Fahim's study deals with the acquisition of

phonological features by his daughter. However, Fahim's study suffers from two major drawbacks. First, in his account, sounds which are produced in meaningful verbal contexts (words and phrases) are not separated from vocalizations and sounds which may have occurred in playful babbling, whereas, most scholars agree that sounds produced by children at the prelinguistic stage of language development cannot be considered early language. Such sounds, which are stimulus-controlled, are the child's involuntary responses to hunger, discomfort, the desire to be cuddled, anger, pleasure and the like. In fact, during the prelinguistic stage, the noises produced by infants in all language communities sound nearly the same. As Jakobson (1968, cited in Ingram 1996, p. 193) states, "the child possesses in the beginning only those sounds which are common to all the languages of the world, while those phonemes which distinguish the mother tongue from the other languages of the world appear only later" (p. 50).

Even children who are born deaf produce these same sounds, despite the fact that they receive no auditory stimuli. Children, in general, have the sensory and motor abilities to produce and comprehend speech (cf. Carter, 1975; Clark and Clark, 1977; Stark, 1980; Oller, 1980; James, 1990).

The second major weakness of Fahim's study is that he has failed to apply the popular 'opposition theory' to his collected data. The ability to use sounds contrastively for the first time is an important landmark in a child's phonological development and according to Cruttenden (1979, p. 16), many studies have failed to take account of this landmark.

To avoid such drawbacks, the present study concentrates exclusively on speech sounds produced by the subject in meaningful verbal contexts. Pre-speech sounds and vocalizations which may be cries of pain, anger, hunger, discomfort, and the like are excluded from consideration on the account given above. In other words, the study is restricted to the central phase of the development of sound system as explained by Elliot (1989, p. 62). Thus, the single-word production period (9-15 months) in

the language development of the child has been selected for the purpose of this article since according to Clark and Clark (1977, p. 391) "mastery of some phonetic segments only begins when children start to use their first words." They further comment that "when children start to use their first words, they no longer seem able to produce some of the very sounds they used when babbling." (P.390). The study is also restricted to the productive process of phonological development only.

Phonological Opposition

Various attempts have been made to explain the process whereby the newborn child slowly and gradually acquires his phonological system (see the references above). One of the most convincing notions is Jakobson's theory of opposition, which, according to Ingram (1996), is still considered to be the major theory of phonological acquisition ever proposed. This theory states that each new sound is added to the child's inventory in terms of its maximal contrast to other sounds (see also Clark & Clark, 1979; Cruttenden, 1979; Ingram, 1988; and Watson, 1991). According to Jakobson (1968), what is important is not single sounds but sound distinctions, and therefore primarily the relation of every sound to all of the remaining sounds of the system. Because of this, there is a relatively fixed order of phonological acquisition which is similar for many of the world's languages, varying among children only in the speed of acquisition.

As Ingram (1996) asserts, despite arguments by some to the contrary, Jakobson's theory remains the most useful theory ever proposed to account for early phonological development. A major feature of Jakobson's theory is that it is directed toward and based upon speech production. Jakobson gives data from the acquisition for 15 languages, based on published articles. Most of the data is on Czech, Bulgarian, Russian, Polish and Serbo-Croatian. The theory makes the claim that the child's words are being restricted by an underlying linguistic system, not just by articulatory constraints. He further claims that the child's linguistic system is under the

influence of linguistic laws that regulate the order of acquisition of oppositions. Table 1, borrowed from Ingram (1996, p. 192), presents a summary of Jakobson's proposed order of acquisition of the first phonological oppositions. These are part of what he calls the first stage. The child develops the minimal consonant and vowel system upon which all further development is based.

Table 1. The first stage of phonological development

Substages	
1.	The acquisition of vowels and consonants develops from a basic CV syllable which contains a forward articulated stop, and a wide vowel; it may appear singly, e.g. 'pa', or reduplicated, e.g. 'papa'.
2.	The appearance of the first consonantal opposition, nasal vs. oral, e.g. 'papa', 'mama'.
3.	The appearance of the second consonantal opposition, labial vs. dental, e.g. 'papa' vs. 'tata', 'mama' vs. 'nana'.
4.	The appearance of the first vocalic opposition, narrow vs. wide vowel, e.g. 'papa' vs. 'pipi'.
5.	The appearance of the second vocalic opposition, either: <div> <div>(a) Splitting of narrow vowel into front vs. back, e.g. 'papa' vs. 'pipi' vs. 'pupu'</div> <div>(b) splitting of narrow vowel into a more open vs. narrow opposition, e.g. 'papa' vs. 'pipi' vs. 'pepe'</div> </div>
Minimal consonant system: m - n	
p - t	
Minimal vowel system:	i u (or) i
	a e
	a

As Watson (1991) puts it, one of the tasks facing any child learning the phonology of his/her native language is "to deduce the set of 'oppositions' which constitute the phonological structure of the language" (P.27). As said earlier, an important landmark is reached in a child's linguistic development when he begins for the first time to use sounds contrastively. Once he has two words in his vocabulary, say [mama] and [papa], the process of acquiring the phonological system has begun (Cruttenden, 1977). According to this view, regardless of what has

gone on before and during the babbling stage, a child starts off speaking (meaningfully) with two consonantal units (or phonemes) and one vowel unit, as in the examples above. He builds up his phonemic (as opposed to sound) repertoire by a process of 'binary splits'.

Method

Subject

The subject of the present study was the author's second child, Arsham. Arsham was born in Great Britain where his father was working on his Ph.D. research in Applied Linguistics. Since the longitudinal study was intended to focus on 'simultaneous bilingualism', the child was exposed to Farsi and English from birth.

The Bilingual Policy and Parental Discourse Strategy

A bilingual policy was established according to which the mother would only speak to Arsham in Farsi, and the father would only speak to him in English, i.e. dilingual communication was the normal practice. Both parents were fluent in English and Farsi; however, in the presence of the child they spoke to each other only in the assigned languages in order to reinforce the one parent-one language discourse strategy.

The child was also exposed to English through TV and English-speaking family friends. His exposure to Farsi up to 23 months of age was limited to his mother and a few Farsi-speaking friends who visited the family infrequently.

As a parental discourse strategy, if the child said something in Farsi when speaking to his father the latter would pretend that he had not understood and thus demanded or encouraged the child to express himself in English. The same strategy was employed by the mother if Arsham used English instead of Farsi when talking to her.

The bilingual policy was strictly followed cooperatively by the two parents, to the extent that Arsham was soon able to make the one parent-one language association: if one of the parents addressed

him, by mistake, in a language s/he was not assigned to, he would show signs of surprise.

Data Collection

Three methods were employed for collecting the data: diary records, audio-recording, and occasional informal experiments for checking the comprehension and production abilities of the subject. The phonetic transcriptions of utterances were included in the diary on site. That is, the investigator being bilingual in Farsi and English and a trained phonetician transcribed Arsham's utterances in the two languages on site. Also details of the context in which such utterances were produced were added. However, when the investigator was not present his wife was asked to tape-record Arsham's utterances. The audio-recorded material was transcribed subsequently by the researcher.

For testing Arsham's receptive knowledge, the researcher named different objects (mostly his toys and pictures in his books) and asked him either to point to them or fetch the objects, e.g. "Arsham, bring me your tortoise" (his toy), or "Where's the drum?" (in his book). In the majority of cases, he responded appropriately. In order to test Arsham's active vocabulary, the researcher asked him to name objects or pictures: "What's this, Arsham?". The researcher's wife was asked to use the same strategy to test Arsham's receptive and productive knowledge of Farsi. It should be pointed out that although comprehension was checked occasionally, this study is based on production data only.

The linguistic record was kept chronologically; however, for the ease of illustration the data will be presented here monthly following Bennett-Kastor's (1988, p. 59) advice who recommends monthly presentation as opposed to methods in which age of the child is reported by specifying days and weeks, which can become confusing at times.

Data collection began when Arsham's first comprehensible words were produced (from 9 months on). A record of his vocabulary in English and Farsi was kept. After transcribing Arsham's utterances they were entered into computer files by language and month, e.g. 12E for English words produced at

12 months of age. In these files, each entry consisted of (i) the child's utterance, i.e. his pronunciation of the word (the phonetic type); (ii) the phonetic form of the adult equivalent; (iii) the word in orthography, i.e. the lexical type; and (iv) details of the context in which the utterance was produced. In the case of Farsi words, English equivalents were provided.

Procedure

For the purposes of the present article, an attempt was made to establish the child's phonetic inventory. That is, the sounds Arsham used to construct his meaningful words during phase I of the study were identified by entering the utterances in computer files using broad phonetic transcription. Narrow phonetic transcription with diacritics and raised elements was avoided, following Ingram's (1996) guidelines, since such details are faintly heard or are questionable in the transcription. The data collection began when the child was 9 months old and his utterances became meaningful. The period ends before some early multi-word utterances were produced and vocabulary spurt occurred (at 16th month).

A Comparison of English and Farsi Sound Systems

Farsi (also known as Persian) is a member of the Western Iranian branch of the Indo-Iranian family within the Indo-European language family. It is the official language of Iran. The dialect acquired by the child in the present study is the one spoken in Tehran, which is the native variety of the child's mother.

Although Farsi and English belong to the same family of languages, they differ in their phonological structures (cf. Yarmohammadi, 1996). Apart from phonetic differences, there are certain English consonants and vowels which do not exist in Farsi. These include / θ , ð , ŋ , ɪ , ə , u , ʌ / , and the diphthongs / ɔy , aw , ɪə , uə , and eə /. Similarly, some of the Farsi consonants and vowels (i.e. / ? , q , x , o /) are lacking in English. The following contrastive charts, based on Yarmohammadi (1996) illustrate this point.

Table 2. Contrastive phonemic chart of English and Farsi consonants

Place of Articulation	Bilabial		Labio-Dental		Interdental		Dental-Alveolar		Alveo-Palatal		Palatal		Velar		Post velar		Glottal	
Manner of Articulation	E	F	E	F	E	F	E	F	E	F	E	F	E	F	E	F	E	F
Stops	VL	p	p	-	-	-	t	t	-	-	-	-	k	k	-	-	-	-
	VD	b	b	-	-	-	d	d	-	-	-	-	g	g	-	q	-	ʔ
Fricatives	VL	-	-	f	f	-	s	s	ʃ	ʃ	-	-	-	-	-	-	-	-
	VD	-	-	v	v	-	z	z	ʒ	ʒ	-	-	-	x	-	-	h	h
Affricates	VL	-	-	-	-	-	-	-	tʃ	tʃ	-	-	-	-	-	-	-	-
	VD	-	-	-	-	-	-	-	dʒ	dʒ	-	-	-	-	-	-	-	-
Nasals	m	m	-	-	-	-	n	n	-	-	-	-	ŋ	-	-	-	-	-
Laterals	-	-	-	-	-	-	l	l	-	-	-	-	-	-	-	-	-	-
Vibrants	-	-	-	-	-	-	r	r	-	-	-	-	-	-	-	-	-	-
Glides	w	w	-	-	-	-	-	-	-	-	j	j	-	-	-	-	-	-

Key: E = English

F = Farsi

VL = Voiceless

VD = Voiced

Table 3. Contrastive phonemic chart of English and Farsi vowels

	Front		Central		Back	
	E	F	E	F	E	F
Close High	i	i			u	u
	ɪ	-			ʊ	-
Mid	e	e	ə	-	ɔ	o
Low	æ	æ	a			a

Diphthongs

Farsi shares only three diphthongs with English namely /ey, ow, and ay/. The other common English diphthongs /oy/ and /aw/, and the diphthongs used mainly in British English (/ɪə, ʊə, and eə / are not used in Farsi.

Syllable Structure

English has a much wider range of clusters than Farsi. Keshavarz (1997, pp. 44-47) lists 18 types of syllables for English whereas in Farsi only 6 syllable types exist.

The syllable structure of Farsi can be represented as CV(C)(C). This means that Farsi does not permit any initial consonant clustering, and it allows only clusters of two consonants in syllable final position. English, on the other hand, permits up to three consonants initially and four finally. The syllable structure of English can be represented as (C)(C)(C)V(C)(C)(C)(C). Therefore, there exists a significant contrast between English and Farsi with regard to syllable structure.

The Analysis of Phonological Development by Arsham

a. Consonantal System

Like many other children, Arsham's first words included reduplication of an open syllable consisting of a consonant plus an open vowel, e.g. [mama] 'mommy', [baba] 'daddy', [dædæ] 'out' [nini] 'baby', [dudu] 'bird'. Later closed syllables were produced, such as [in in] 'this, this', [bib bib] 'car', [un un] 'that, that', [dæs dæs] 'hand, hand', and [nun nun] 'bread, bread'.

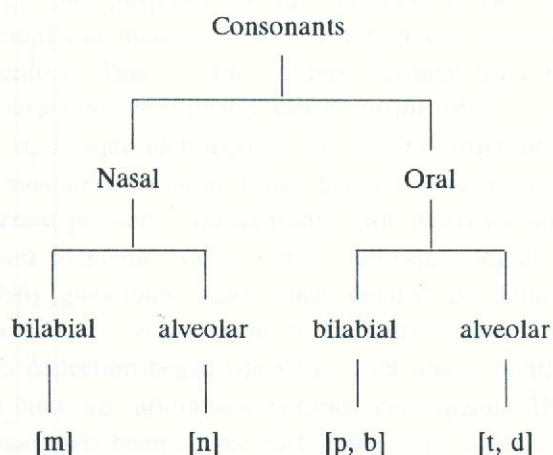
The first consonantal phonemic contrasts Arsham

developed were as follows.

1. Opposition between nasal and oral consonants, e.g. [baba] and [mama], [dædæ] and [mæmæ], [didi] and [nini], [ka] and [næ].

2. Opposition between bilabial and alveolar consonants, e.g. [mama]/[nana], [baba]/ [dædæ], [abedi], [pvt], [bʊdi], and [bædi].

These are illustrated by the following tree diagram.



(An opposition was also found between different types of vowels, e.g. [mama] vs [mæmæ], [nəna] vs [nini], [dædæ] vs [dʊdu]).

The most frequent consonants Arsham produced during Phase I were oral and nasal stops made in different places of articulation. These included: [b, d, m, n, t, p]. The first occurrence of a non-plosive consonant were the fricative sounds [f] and [ʃ] at the age of 9 and 10, respectively. He produced his first affricate [dʒ] in the Farsi word [dʒiʃ] 'wee-wee' and the English word 'juice' when he was 14 months old.

Altogether, Arsham produced 16 consonants during the central phase (9-15 months). These are illustrated in the following consonantal chart.

It needs to be pointed out that the consonants [z, r, ɣ, w] occurred only once in the English and Farsi words [nʌz] 'nose', [dær] 'door', [gæməɪ] 'nose' and [bɔw wɔw] 'dog', respectively. Since these sounds

Table 4. Chart of Consonants during Phase I

Manner of Articulation	Places of Articulation					
	Bilabial	Labio Dental	Dental - Alveolar	Alveo - Palatal	Velar	Glottal
Stops	p, b		t, d		k, g	ʔ
Fricatives		f, v	s	ʃ		h
Affricates				dʒ		
Nasals	m		n			
Lateral			l			

were infrequent and marginal, according to Ingram's (1996, p. 206) criterion of frequency, they could not be taken into consideration in establishing Arsham's phonetic inventory.

Table 5 below gives the frequency of occurrence of all consonants together with illustrative examples from the data.

Table 5. Frequency of Consonants in Farsi and English during Phase 1

Consonant	New	Old	Total	Examples
p	7	-	7	pʌdi, pu, pepθ
b	12	3	15	baba, bθbɪ, bodi
t	3	1	4	tedi, put, petikow
d	12	3	15	dædæ, dudu, dædi
k	3	-	3	mθlk, kæ, petikow
g	3	-	3	gol, gæmɣ, gæɪs
ʔ	3	-	3	ʔæm ʔæm, mʊʔ, ʔæpʊl
f	4	-	4	uf, mʌf, nʌf
v	2	-	2	avɪʃ, avʃæɪn
s	4	-	4	dæs dæs, dʒʊs, pθnsθl
ʃ	5	3	8	mæʃ, bʌʃ, aʃʌn
dʒ	2	-	2	dʒɪʃ, dʒʊs
h	2	-	2	ah, hʊf hʊf
m	7	2	9	mama, mæmæ, mθlk
n	10	1	11	nθna, nini, nun nun
l	5	-	5	gol, bθl, blɔ

As can be seen, the most frequent consonants were the front plosives and the nasals /m/ and /n/. This has also been the case with other children (cf. Yeni-Komshian, et al. 1980; Vihman, et al. 1985; Maken, 1980 and 1990).

Positional Variation

Consonants are generally learnt first in syllable-initial position, then inter-syllabic or word-medial position, and lastly in syllable-final position

(Cruthenden, 1979, p. 21). One exception seems to be fricatives, which are used first in post-vocalic positions (Olmsted, 1971; Ferguson, 1973). Arsham's phonetic inventory was established separately for word-initial and word-medial and final consonants, as shown in Tables 6 and 7.

These two tables show that while stops occurred in both initial and non-initial positions, fricatives occurred only in post-vocalic positions during phase I. This is in line with observations made by other

Table 6.

Word-Initial Consonants	
p	padi, pu, put, pepð, pðnsðl, petikow
b	baba, bðbl, bðdi, buði, bodi, bib bib, bɔl, blɔ, bðbay, bow wow
t	tedi
d	da, dædæ, dudu, didi, dædi, dær, dæs dæs
k	kæ
g	gol, gæmy, gæsls
ʔ	ʔæm ʔæm, ʔæpʊl
m	mama, mæmæ, mæf, moʔ, mɒf, mðlk
n	næ, nini, nðna, nun nun, nʊz, nɒf
dʒ	dʒis, dʒus
h	hʊf hʊf

Table 7.

Word-Medial and Final Consonants	
p	ʔæpʊl, pepð
b	baba, abedi, bðbl, bib bib
t	put, petikow
d	dædæ, dudu, dædi, didi, bðdi, tedi, abedi, bodi, buði, padi
k	mðlk, petikow
ʔ	moʔ
m	mama, mæmæ, gamay
n	nðna, nini, in in, un un, nun nun, afʃæn, avʃæn
f	uf, mɒf, nɒf
v	avɪf, avʃæn
s	dæs dæs, dʒus, pðnsðl
ʃ	mæf, baʃ, dʒɪʃ, avɪʃ, aʃan, avʃæn
i	gol, bɔl, blɔ, mðlk, pðnsðl
h	ah

researchers concerning the positional variations of consonants (cf. Olmsted, 1971; Ferguson, 1973; and Cruttenden, 1979).

b. Vowel System

The first vowel phonemes Arsham produced were [a, æ, i, e, u]. These were mostly used in open syllables such as: [mama, baba, dædæ, mæmæ, nin, dudu, tedi]. Less frequently, they were used in close syllables, e.g. [mæʃ, in, dæʃ, baʃ, un].

Altogether 11 vowels were produced by Arsham during the single-word production period (9-15

months). Table 8 below illustrates the distribution of these vowels.

Table 8. Accumulative Vowels during Phase I

i	u
I	ʊ
	o
	ə
e	ɔ
	ʌ
æ	a

It needs to be pointed out that Arsham made use of English vowels which do not exist in Farsi namely [ɪ, ʊ, ə, and ɔ]. Similarly, he used the Farsi mid back rounded vowel [o], as in [gol], which does not exist in English. This can be considered as an advantage of bilingualism as the bilingual child has available to him two language systems to choose

from. (For a contrastive analysis of English and Farsi sound systems see Yarmohammadi, 1996).

The most frequent vowels during Phase 1 were [a, æ, and i] and the least frequent one was the Farsi [o]. Table 9 gives the frequency of vowels with illustrative examples.

Table 9. Frequency Chart of Vowels

Consonant	New	Old	Total	Examples
i	13	3	16	nini, didi, dʒɪf
ɪ	3		3	bɒbɪ, gæsls, petlkow
e	4	1	5	pepe, tedi, abedi
æ	14	4	18	kæ, dædæ, mæmæ
a	13	4	17	baba, mama, da
u	7	1	8	pu, dudu, dʒus
ʊ	3	1	4	bʊdi, nʊz, ?æpʊl
ɔ	2	1	3	mɔ?, bɔl, blɔ
o	2		2	gol, bodi
ə	7	1	8	bɒbɪ, bɒdi, pepə
ʌ	3		3	mʌf, nʌf, pʌdi

Only two diphthongs were produced by Arsham during Phase I namely [ay] and [ow] as in 'babay' and 'bow wow', respectively. However, the frequency of these two was very low ([ay] occurred only twice and [ow] only once); therefore, they can be excluded from consideration.

Table 10 gives the positional variation of vowels. As this table shows, most vowels occurred in word medial or final position, with the exception of /i/, /æ/, and /u/ which also occurred in the initial position. Even in the case of these vowels, their most frequent use was in non-initial position.

Syllable structure

Altogether six syllable types were found in Arsham's speech during phase one of the study. Five of these were common to both languages (English and Farsi), but the sixth type (CCV) does not exist in Farsi as this language does not permit consonant clusters in word-initial position. However, the child being bilingual can make use of the syllable structures of both languages he is exposed

Table 10. Positional Variation of Vowels

Vowels	Initial Position	Non-Initial Position
i	in in	tedi, bɒdi, bʊdi, dædi, pʌdi, nini, ni, didi, dʒɪf, bib bib, abedi, avɪf
ɪ		bɒbɪ, gæsls, petlkow
e		pepe, tedi, abedi, petlkow
æ		dædæ, mæmæ, dædi, næ, mæf, dæsls, dær, afæn, ?æpʊl, avfæn, kæ, gæsls, ?æm ?æm, gæmay
a	a:, ah, avɪf, abedi, afæn, avfæn	baba, mama, da, baf, nɒna, nanay, gæmay
u	uf, un un	pu, dudu, put, γus, nun nun
ʊ		bʊdi, nʊz, ?æpʊl, hʊfʊf
ɔ		mɔ?, bɔl, blɔ
o		gol, bodi
ə		bɒbɪ, nɒna, mɒlk, bɒbay, pepə, pɒnsɒl, bɒdi
ʌ		mʌf, nʌf, pʌdi

to and thus produce a wider range of syllables. Table 11 below lists different types of syllables produced by Arsham during the first stage together with illustrative examples and frequencies.

Table 11. Type and Frequency of Syllables during Phase I

Syllable Type	Examples	Frequency
V	a:, aʃan, abedi, aviʃ	6.89
VC	ah, uf, in in, un un	6.89
CV	ni, da, pu	45
CVC	mæʃ, baʃ, dæʃ dæʃ	37.8
CVCC	mɒlk	1.72
CCV	blɒ	1.72

The frequency rank of the syllables shows that the CV type was the most frequent syllable during the single-word production period. This confirms Jakobson's (1968) proposed order of acquisition, reiterated by many other researchers (cf. Ingram, 1996). According to this theory, the CV syllable is seen as the starting point in acquisition for both vowels and consonants. This syllable may appear singly, e.g. [pa], [da], [næ], or in reduplicated forms, e.g. [baba], [mama], [dædæ], [dudu]. All further development, as said by Ingram (1996), is based on this initial syllable.

The next most frequent syllable was CVC (37.8%), and the least frequent syllables were those with a consonant cluster either in word initial or final position. These occurred only once in the data.

Conclusion

The main contribution of this paper, apart from its being the first bilingual case study on Farsi-English phonological development, is that bilingual children have a larger inventory of sounds available to them. As said earlier, Farsi lacks certain vowels and consonants existing in English, such as /ɪ, ə, v, ɔ, ʌ, θ, ð, ŋ/. However, the subject of the present study, being bilingual, used these sounds during his early meaningful word production period. Similarly, he used the Farsi sounds /ʔ/ and /ɣ/ lacking in English. This led to a large inventory of

phonemes in Arsham's speech. As Watson (1991, p. 34) states, there is agreement in the literature that bilingual children attain the facility to function in two different languages simultaneously, without taking twice as long-or, it seems, any significantly longer time-than a monolingual needs to acquire one.

The findings also confirm the popular theory of opposition and order of acquisition of sounds. As pointed out earlier, review of literature shows that the CV syllable is the starting point in acquisition for both vowels and consonants and further development is based on this initial syllable. The frequency rank of syllable types in the present study also demonstrate that this CV syllable is the most frequent one used by Arsham during Phase I of the study.

References

1. Ashrafi, H. R. (1993). The acquisition of interrogation in Farsi: A functional approach. MA thesis, University for Teacher Education, Tehran, Iran.
2. Atkinson, M. (1982). *Explanation in the study of language acquisition*. Cambridge: Cambridge University Press.
3. Carter, A. (1975). The transformation of sensory-motor morphemes into words: A case study of the development of 'more' and 'mine'. *Journal of Child Language*, 2, pp. 233-250.
4. Clark, H. H. and Clark, E. V. (1977). *Psychology and language*. New York: Harcourt Brace Jovanovich.
5. Cruttenden, A. (1979). *Language in infancy and childhood*. England: Manchester University Press.
6. Elbers, L. and Ton, J. (1985). Play pen monologues: The interplay of words and babbles in the first words period. *Journal of Child Language*, 12, pp. 551-67.
7. Elliot, A. J. (1989). *Child Language*. Cambridge: Cambridge University Press.
8. Ferguson, C. A. and Farwell, C. B. (1975). Words and sounds in early language acquisition. *Language*, 51, pp. 49-99.
9. Fahim, M. (1996). Stages in the acquisition of Farsi. *Proceedings of the third Allameh Tabataba'ei linguistic conference*, pp. 235-59, Alameh Tabataba'ei University, Tehran, Iran.
10. Gusmann, E. (1980). *Studies in abstract phonology*. Cambridge, MA: MIT Press.

11. Ingram, D. (1974). Phonological rules in young children. *Journal of Child Language*, 1, pp. 49-64.
12. _____ (1979). Phonological patterns in the speech of young children. In Fletcher, P. and Garman, M. (eds.) *Language Acquisition*. Cambridge: Cambridge University Press, pp. 133-149.
13. _____ (1981). *Procedures for the phonological analysis of children's language*. Baltimore, Md.: University Park Press.
14. _____ (1985). On children's homonyms. *Journal of Child Language*, 12, pp. 671-80.
15. _____ (1988). Jakobson revisited: some evidence from the acquisition of polish phonology. *Lingua*, 75, pp. 55-82.
16. _____ (1990). Phonological development: production. In Fletcher, P. and Garman M. (eds.), *Language Acquisition*, (2nd Ed.) Cambridge: Cambridge University Press. pp. 174-197.
17. _____ (1996). *First language acquisition: Method, description, and explanation*. Cambridge: Cambridge University Press.
18. Jakobson, R. (1941/68). *Child language, aphasia, and phonological universals*. The Hague: Moulton. Translation by R. Keiler of the original German version of 1941.
19. Keshavarz, M. H. (1997). *A practical course of phonetics and phonology*. Tehran: SAMT Publishers.
20. Kiparsky, P. and Menn, L. (1977). On the acquisition of phonology. In Macnamara, J. (ed.) *Language learning and thought*. New York: Academic Press, pp. 47-78.
21. Leopold, W. (1947). *Speech development of a bilingual child: a linguist's record. Vol. 2: Sound learning in the first two years*. Evanston, Ill.: Northwestern University Press.
22. Locke, J. L. (1990). Speech perception and the emergent lexicon: an ethological approach. In Fletcher, P. and Garman, M. *Language Acquisition*, (2nd Ed.) Cambridge: Cambridge University Press. pp. 240-50.
23. MacKain, K. S. (1982). Assessing the role of experience on infants' speech discrimination. *Journal of Child Language*, 7, pp. 527-542.
24. Macken, M. A. (1980). Aspects of the acquisition of stop systems: A cross-linguistic perspective. In Yeni-Komshian, G., et al. *Language Acquisition*. (2nd Ed.) Cambridge: Cambridge University Press. pp. 253-265.
25. _____ (1990). Phonological development: A cross-linguistic perspective. In Fletcher, P. and Garman, M. (eds.), *Language Acquisition*, (2nd Ed.) Cambridge: Cambridge University Press. pp. 251-268.
26. Macken, M. A. and Barton, D. (1980). The acquisition of the voicing contrast in English: The study of voice onset time in word-initial stop consonants. *Journal of Child Language*, 7, pp. 41-74.
27. Menn, L. (1971). Phonotactic rules in beginning speech. *Lingua*, 26, pp. 225-51.
28. _____ (1980). Phonological theory and child phonology. In Yeni-Komshian, et al., pp. 23-41.
29. _____ (1983). Development of articulatory, phonetic, and phonological capabilities. In B. Butterworth (ed.) *Language production*, Vol. 2. New York: Academic Press, pp. 3-50.
30. Oller, D. (1980). The emergence of the sounds of speech in infancy. In I. G. Yeni-Komshian, et al (eds.) *Child Phonology: Vol. 1 Production*. New York: Academic Press.
31. Olmsted, D. (1971). *Out of the mouth of babes*. The Hague: Mouton.
32. Pye, C. Ingram, D. and List, H. (1987). A comparison of initial consonant acquisition in English and Quiche. In K. E. Nelson and Van Kleeck (eds.) *Children's language*, Vol. 6: 175-90, Hillsdale, NJ: Eelbraum.
33. Rashtchi, M. (1999). Grammatical development of a Farsi-speaking child. *Iranian Journal of Applied Linguistics*, Vol. 4, No. 1.
34. Ratner, N. B. (1994). Phonological analysis of child speech. In Sokolov, J. L. and Snow, C. E. (eds.) *Handbook of research in language development using CHILDES*, pp. 324-34.
35. Schwartz, R. and Leonard, L. (1982). Do children pick and choose? An examination of phonological selection and avoidance in early acquisition. *Journal of Child Language*, 9, pp. 319-36.
36. Smith, N. V. (1973). *The acquisition of phonology: A case study*. Cambridge: Cambridge University Press.
37. Stark, R. (1980). Stages of development in the first year of life. In I. G. Yeni-Komshian, et al (eds.) *Child Phonology: Vol. 1 Production*. New York: Academic Press.