Early Phonological and Lexical Development of a Farsi Speaking Child: A Longitudinal Case Study

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The present study aims at the description and analysis of the phonological and lexical development of a child who is acquiring Farsi as his first language. The child's language production at the holophrastic stage of language development, mainly single words, is observed and recorded longitudinally for nearly seven months since he was 16 months old until he turned 23 months. An attempt is made to see if the phonological and lexical findings of the same period found in other languages are confirmed in the case of Farsi (an Indo-European language). Issues like noun dominance in the early words, vocabulary spurt of the toddlers, and the dominant CVCV, CVC, CV syllabic structures are the focal points in this study. The significance of the study lies in the fact that the number of the studies done on the language development of monolingual Farsi speaking children is very few.
Keywords: First Language, Farsi, Holophrastic Stage, Lexical Development, Phonological Development.

In spite of the abundance of the theories about the language acquisition process and the internal and external factors contributing to L1 development, a comprehensive theory is yet to be born. The point that the process has been divided into a series of stages may provoke the misconception that first language acquisition takes place through distinct successive segregated

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phases (Owens, 2001), though we should bear in mind that such categorizations are simply arbitrary and oriented towards simplification of the acquisition process studies. The borderlines between these stages are too indistinct and bound to individual subtle variations. When it comes to language acquisition, all children share the same destination but no two follow exactly the same path or travel at exactly the same speed (O'Grady, 2005). Indeed, rather than seeing children's language development as a kind of progressive approximation to a goal, [a goal that is extrinsically fixed and defined so that each new step is seen as an imperfect attempt to attain it] Halliday (2003, cited in Webster, 2003: 5) maintains that "What small children are doing is learning how to mean; [….] the child is building up a potential and in doing so, is essentially tracking the processes whereby language first evolved". Individual developmental differences are related to differences in intellect, personality, and learning style; ethnicity and the language of the home; socioeconomic status, family structure and the birth order (Wells, 1985). In general, these relationships are very complex, not simply a matter of cause and effect. Some factors such as intelligence may be stronger than others (Wells, 1985). It is believed that the emergence of the child's first word at around the first birthday is the hilarious moment that the language use and development trigger is pulled (Nelson, 1991; Nelson, Hampson, & Shaw, 1993), although Mama-like sounds have been detected in children's vocalizations starting from as early as two weeks of age to around five months, usually in wanting contexts (wanting to be picked up, wanting food and so on) (O'Grady, 2005). Children's early words which develop to fulfill the social functions, originally conveyed by gestures (Nelson,1991; Nelson, Hampson, & Shaw , 1993) reveal a structure that is neither an imitation of adult speech nor fully grammatical by adult standards (Carroll, 2008), but idiosyncratic language which, with further development, approaches the adult speech norms and grammatical standards.

Stages of Language Development

According to Owens (2001, p.72), there are six stages of language development generally recognized to govern first language development:

Pre-linguistic stage

- crying
- cooing
- babbling
    Linguistic stage
- Holophrastic stage
- Two-word stage
- Telegraphic stage
- Immediate Development Stage
- Adult stage

The onset of the linguistic stage is what is called single-word or holophrastic stage although, through the second and third phases of pre-linguistic stage, i.e., cooing and babbling, distinct language specific sounds begin to emerge (Carroll, 2008). Babbling is thought to be a form of play in which various sounds are practiced and mastered before they are put to communicative usage (Owens, 2001). There are several reasons to think that babbling is non-communicative. One reason is that sounds made during babbling are similar to but phonologically sloppier than the corresponding sounds made later on. While the "ma" of the 7 month old and that of 18 month old may sound similar, when the two utterances are examined spectrographically, the earlier sound is generally sloppier and exhibits a greater range of acoustic properties than true speech (Carroll, 2008). Another reason is that infants have been found to babble more often when an adult is not present than when one is present (Nakazima, 1975); for instance, babies often babble in the crib when awakening and before falling asleep, and since no one is present, it is difficult to see these as communicative acts (Carroll, 2008).

The emergence of the first words or vocalizations does not signal the end of vocalizations such as babbling, jargon, and

phonetically consistent forms (Owens, 2001). All three continue to be produced by the child throughout the second year of life (Robb, Bauer, & Tyler, 1994) during which the child increases his or her vocabulary and begins to combine words within a single utterance. Gradually the child realizes that a word refers not to a single referent but to a related group of referents (Oviatt, 1982).

As Markman and Watchel (1988) put it, three basic assumptions have been stated regarding the lexical development in toddler speech. :

    a) Reference Principle: The children know that people use words to refer to other entities.
    b) Extendibility Principle: Words or symbols usually represent concepts not unique referents
    c) Whole- object Principle [Horton & Markman, 1980; McNamara, 1982; Markman & Watchel, 1988]. A label refers to a whole entity rather than to a part or attribute. In fact, object parts are rare in toddler's lexicon.

Three additional assumptions including taxonomic or categorical assumption, the novel name-nameless assumption, and the conventionality assumption (Golinkoff et. al., 1994; Markman, 1992) may also be enabling the toddler to form hypothetical definitions for the words.

A number of studies, like Bassano, Eme, and Champaud (2005), have shown that children initially vary in acquiring their lexicon, showing individual differences in rates of development as well as in learning styles. As noted in the decisive synthesis by Bates, Dale & Thal (1995), these variations are relevant to understanding the mechanisms that underlie normal language development: to the extent that they are substantial and stable, and have their own developmental course, they provide a window onto the correlates and (by inference) the causes of developmental change; they can be used to pinpoint critical developmental transitions that form the basis for theories of learning and change (Bates et al., 1995).

Children sometimes invent their own symbols to refer to objects or events in their environment. These personalized words are called *idiomorphs* (Carroll, 2008). It appears that children draw

from their language experience in forming these idiomorphs. Some of these idiomorphs are simplifications of adult speech to the sounds of the objects to which they refer. Idiomorphs underline several important aspects of development. First, they indicate that children's language is creative: children do not simply imitate the language they hear, but instead sometimes take this language and use it in novel ways. Second, idiomorphs indicate that children have learned that it is important to be consistent even if they have not yet grasped that objects have names or perhaps they know this, but do not yet know the names. In either case, idiomorphs are a transitional stage between babbling and true words (Carroll, 2008).

Holophrases: The Structure

Children at holophrastic stage tend to use single words to express larger chunks of meaning that mature speakers would express in a phrase or sentence. Holophrases appear to be precursors of multiword utterances but it is not certainly clear what grammatical knowledge children have at the holophrastic stage. Two positions are noteworthy in this regard. One early approach was to consider the holophrase as an implicit sentence. McNeil (1970) has argued that children at the holophrastic stage have some knowledge of certain syntactic relations, but are not able to express them formally in their speech. In this view a single word such as "dog" might refer to the subject in the complete sentence "the dog is drinking water".

Greenfield and Smith (1976) present a somewhat different approach. They claim that young children use their single words as adults use sentences but do not have the grammatical knowledge implicit in the sentence. Greenfield and Smith identified the following semantic relationships that were expressed in single word speech (Carroll, 2008, p.271):

Relation	Instance
Naming	Dada ,(looking at father)
Volition	Mama, (looking at the bottle of milk)
Agent	Dada, (hearing someone come in)

Action	Down, (when he sits or steps down)
Object	Ball, (having just thrown it)
State of Object	Down, (having just thrown something)
Associated Object	Cracker, (pointing to the door room where crackers are kept)
Possessor	Lauren, (upon seeing Lauren's empty bed)
Location	Box, (putting crayon in box)

Thus, "Dada" when used in a context in which the child's father has just arrived home would express the agent relationship. If instead, "Dada" were said when the infant pointed at the father's chair, it would be an example of the possessor relationship. Greenfield and Smith conclude that children in effect use the environment as the rest of their sentence.

Owens (2001) maintains that although single word utterances are basically structure-free, they still demonstrate some of the underlying cognitive concepts. Nomination or naming is signaled by words such as "see", "this", or "that". Recurrence is marked by "more" and "nuther". Nonexistence markers are phrases such as "all gone", "no more" and "no".

Holophrases: The Concept Formation

Knowledge structures of two types are assumed to guide word acquisition: taxonomic knowledge and event-based knowledge (Sell, 1992). Taxonomic knowledge consists of categories and classes organized hierarchically. New words are compared categorically and organized for retrieval. Until a child has a label for a concept, he relies on overextensions such as calling all men "Daddy" or novel words, such as ""go-boom" for "gun" (Owens, 2001, p.199). Event based knowledge or representation consists of sequences of events or parent-child routines used to separate events from non events. Event based knowledge is temporal in nature and is organized toward a goal, contains actors, roles, props, and alternatives, and may include embedded sub-events (Fivush, 1984; Nelson, Fivush, Hudson and Lucariello, 1983, cited in Owens, 2001). Event based knowledge

influences vocabulary acquisition and may be the basis for taxonomic knowledge (Kyratzis, Lucaiello,& Nelson, 1988, cited in Owens,2001). The child uses this knowledge to form scripts for predictable interactional sequences. Scripts or set of expectations about the routine events that aid memory and enhance comprehension.

Event based knowledge influences vocabulary acquisition and may be the basis for taxonomic knowledge (Owens,2001). Words are learned within a social context; their meaning is found in event representations. Early words are first comprehended and produced in the context of everyday events. Embedded within event scripts are the words that are part of the event. From repeated use, the words themselves become cues for the event. For example, the words "bath" and "soap" become cues for bathing while "cookie" and "juice" represent snack. As the child acquires more words, cookie, cracker, milk, and juice become things he eats which later evolves into the category of food (Owens, 2001).

As Barrett (1986) states, the toddler initially uses language to discuss objects, events, and relations which are present. A word refers to a stored concept rather than to an actual entity. The child's early lexicon until about eighteen month of age seems to follow a rule of mutual exclusivity which states " if the word means X, it can not mean Y or Z". The child may use two different processes to form internal representations. Some symbols may be context bound or attached to certain events, and thus, only used in that context. Many of such word definitions will be modified and become decontextualized. Other words may be used to designate entities, actions and relationships in several contexts. The definition of such words may broaden with maturity. In general, context bound words are less likely to appear as the child approaches two years of age (Barrett, et al., 1991; Dromi, 1987).

Phonological Processes of the Early Words

Four phonological processes are found to be commonly used by children in early word production (Dale, 1976; Oller, 1974).

- Reduction: it occurs when children delete or eliminate sounds. It is common for children at the early stages of language development to have difficulty with consonant clusters and reduce them when they occur at the beginning of a word. An example would be saying "tore" for "store".
- Coalescence: it occurs when phonemes from different syllables are combined to form a single syllable. For example saying "paf" for "pacifier".
- Assimilation: It occurs when children change one sound to make it similar to another sound in the same word. An example would be saying "nance" for "dance" .
- Reduplication: it occurs when one syllable of a multi-syllabic word is repeated as in "dada" for daddy or "mama" for "mommy".

Such processes are common but not invariant in child language; different children may use different processes to varying contexts (Carroll, 2008). According to Dale (1976) and Oller (1974) these simplification errors are part of a more general linguistic process. Children mastering a phonological system must also pay attention to the syntactic, semantic, and pragmatic features of their utterances. A complex phonological sequence might overload their information processing capacity. Hence, such simplifications are part of their acquisition processes.

Lexical Development: Typology of Early Words

Estimates of children's vocabulary growth indicate that children typically have acquired 14000 words by age 6 (Carey, 1978). They begin by focusing on words related to here and now, an observation that fits well with Piaget's description of the sensorimotor period of cognitive development. Many of their early words consist of nominals that refer to concrete aspects of their environment. They learn the names of toys they play with, the clothes they wear, and the food they eat. Children have a bias

towards objects that change or move in response to their actions. They are more likely to learn the word "ball" than the word "chair". Their early vocabulary is not limited to nominals, though. As Nelson (1973) has shown children use words from various grammatical classes early on. Nelson found that general nominals such as "ball" and "car" were the most prevalent followed by specific nominals (mommy) , action words (up, go) , modifiers (dirty, pretty) , personal and social words (please) and function words (what , for). However, as Reich (1986) has shown, articles that the child cannot easily manipulate (such as diaper) and objects in the environment that do not move are absent in the early vocabulary list. Tomasello (2003) states that children acquire words belonging to different semantic categories of adult language from early on, and it seems that nouns are acquired more readily than verbs or other words in different languages (Bornstein et al., 2004; Gentner, 1982). When the first fifty words are classified according to their grammatical category, the dominant percentage of nouns is apparent. Nouns account for 60-65%, action words less than 20% (Benedict, 1979; Nelson, 1973). Children initially produce referential nouns, i.e., mostly the names of things or objects (Schwartz& Leonard, 1984). This finding seems to be universal (Gentner, 1982) although there may be some minor differences across languages. Individual children exist along continuum from a referential style in which they use many nouns (Noun-Lovers) to an expressive style in which they use few (Noun-Leavers), preferring interactional and functional words such as "hi" , "bye" ,"no", and unanalyzed wholes or formulas. Children with a referential learning style tend to elaborate the noun portion or noun phrase of their sentences, whereas those with an expressive style prefer to elaborate the verb phrase (Owens, 2001).

Why an early preference for Nouns?

One possible reason has to do with the way parents talk to children (O'Grady, 2005); although mothers use more verbs than nouns, they are more likely to prompt children to produce nouns (by asking questions like "what's this?") than verbs. In addition, there is evidence that the nouns mothers use when they speak to

children have meanings that might be easier to learn than those of the verbs they use. Whereas nouns tend to have solid objects with a similar shape, verbs tend to be more diverse and variable. Another possible explanation O'Grady mentions is that the children's perceptual system is especially attuned to noticing objects particularly objects that satisfy the four conditions of cohesion , continuity , solidity, and contact.

Dormi (1987) believes that the child may already have concept of object within his or her world knowledge. Much of the child's first year is spent in social interaction around objects and in object exploration. In another attempt to justify the early noun dominance Diesendruck and Shatz (1997) have concluded that nouns may predominate because they are conceptually simpler and conceptually/perceptually distinct. It is easier for the children to learn a new label that refers to a referent that is perceptually dissimilar from a label which is already in their lexicon. It is also possible that the linguistic predictability of nouns makes them easier to use and accounts for their early predominance.

Owens (2001) maintains that nouns represent specific items and events, and thus, relate to each other and to the other words in specific predictable ways. The frequency of adult use, adult word order, the limited morphological adaptations of nouns and adult teaching patterns seem to affect children's production in favor of the early noun dominance.

Extensions : Over and Under

Sometimes children seem to have overly broad meanings for their words and may therefore use them to refer to more things than the adult language allows. For example, the word "dog" may be used to refer to horses, cows and other four legged animals in addition to canines. Such errors are called over-extension (Carroll,2008, Owens,2001, O'Grady, 2005) but when the word the child uses has a more limited range of referents than the adult language "under-extension" is the term which must be used to describe the process. If the above mentioned word "dog" is used by the child to refer to only a specific breed of dogs and not to all canines, the child has under-extended the word(Owens,2001).

Rescorla (1980) studied children's overextensions and found that some are based on perceptual similarities between objects while others are based on other kinds of similarity such as functional (a child referring to a shirt stuck on a person's head as "hat") , contextual (calling a crib blanket a " nap") and affective (referring to forbidden object as "hot") (Carroll, 2008). Under-extension has received less attention than overextension due to the infrequent occurrence of its instances.

The Aims of the Present Study

The researcher in this case study pursues first to explore the phonological and lexical development of his own son, Mahdi, who is at the holophrastic stage of language development, in a semi-longitudinal study of about six months, and second to see if the research findings of the studies conducted on the phonological and lexical and development of the children at the same holophrastic stage in other languages are confirmed by the present study involving an Iranian child who is acquiring Farsi at the same stage of language development .

Method

Participant

The subject of the study, Mahdi, is the researcher's own child and is born in a bilingual family. Both parents' first language is Turkish and their national language is Farsi. The dominant home language is Farsi. Mahdi is intellectually a normal boy and at the outset of the study was 16 months old. The study continued until he turned 23 months. He does not have much contact with the other children. During the study, he did not go to the nursery, and his working parents took care of him at home in turn.

Data Collection Procedure

The primary method for assessing the children's language abilities before the age of two years is parent reports, and perhaps the most widely used parent report, both in English speaking

countries and elsewhere, is the Mac Arthur-Bates communicative inventory (CDI) (Fenson et al., 1994; Hemmer & Ratner, 1994).The validity and reliability of parental report depends crucially on parents' ability to observe their children's comprehension and production of vocabulary and sentences. The vocabulary production section appears to be the most reliable in the CDI (May, Kemp, &Werker, 2007). In this study the researcher used the same procedure with the only difference that he himself was one of the parents. The child was under the observation of his mother during the time that he was awake. In addition to mother reports which were written in diary form, the father's observations were twofold. During the study period, a weekly 10-20 minutes video-recording session was held in which the child's behavior and linguistic productions in different natural conditions, e.g., playing with the toys, speaking with his mother, playing with the aunt, etc. were video-recorded. In addition to video-recording, the researcher used daily diary writing as the other supplementary data collection technique.

Data Analysis

The subject's language production recorded in videos and diaries were transcribed phonetically, and the transcriptions were reformatted in CHAT* (cf. MacWhinney, 2000) format. The resulting 28 Chat format computer files were fed to the CLAN software and analyses like FREQ, PHONFREQ, FREQPOS and KWAL were done on the data.

Results

The analysis of the data was carried out at two levels of phonological and lexical development.

The Analysis of Phonological development in Mahdi's Speech

- **Consonants**

There are 23 consonants and 6 vowels in the phonological system of Farsi (Vahidian Kamyar & Omrani, 2001), from which 22 consonants were found in Mahdi's speech. The only consonant

that Mahdi did not produce at all was [r]. The typology, place and manner of production of the consonant sounds Mahdi produced have been shown in Table 1.

Table 1.
Place and Manner of Articulation of Farsi Consonants That Mahdi (1;4) Produced

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

The most frequent consonants in his speech were stops with different places of articulation including bilabial stop [b], dental-alveolar [d] and [t]. Following stops, lateral alveolar [l] in middle position was the second most frequent consonant, and the third most frequent consonants were glottal fricative [h] and oral nasal [n]. The least frequent consonants were bilabial fricative [v] which was produced only once at the initial position of the verb [væf] (En. Went). Velar fricative [ʒ] with three instances at the final position of the word [□□□□] (En. Charge), the alveo-palatal affricate [tʃ] with only three instances at the initial position of the words [tʃæx] (En. Bike), and [tʃeʃ] (En. Eye) were the second least frequent consonants in Mahdi's speech during the study period (1;4,16 up to 1;10,6)

Figure 1 illustrates the frequency and positional variation of the different consonants that Mahdi produced in the study period.

Figure 1. Consonant frequency and positional variation

The glottal stop [q] and the glottal fricative [x] which do not exist in the phonological system of English appeared for the first time at nearly 20 and 21 months of age respectively.

As it is evident in Figure 1, some sounds like [f], and [p], … have appeared in only one of the three word positions . Table 2 provides the examples of different consonant sounds produced at initial, middle, and final positions of the words and the related frequency of these sound in each position. The consonant sounds [f], [p], [z], and [ʒ] were not found in initial position while five others i.e., [p], [v], [x], [ʒ], and [tʃ] did not appear in mid position. The consonants which did not appear at the final position were [g], [dʒ], [t], [v], [j] and [tʃ]. The production and distribution of the sounds in different word positions in Mahdi's speech confirm the possibility that Ingram (1997:226) talks about. He believes that it is possible that the phonological processes in children's single word production may be highly influenced by the child's phonological system, not by just universal tendencies. What's more, the late appearance of sound like [r] in Mahdi's speech

supports the findings of other studies about the late acquisition of this sound. Actually, as previous studies (for example, Ingram,

Table 2.
The Frequency and Examples of Consonants in Different Positions

Consonant	Frequency	Initial position Examples	Frequency	Middle position Examples	Frequency	Final position Examples
/b/	89	bu□l, bæbæ, bæq	83	b□:b□:,d□:bd	32	t□□b, □□b , æb
/d/	53	dæx, du□d ,	51	□:b	18	qæd, od□:d
/f/	00	d□□j□□	01	d□□d□:,	11	u□f , væf, dæ**f**
/g/	14	--------------------	04	d□ædæ	00	--------------------
/h/	34	--	22	hæft□□	22	m□□h,bæh,henhe n
/d□/	13	gode, gol, gu□□	05	□□bgu:□,	00	
/	03	hæmem, henænæ	02	hæmhæm,	03	--------------------
/k/	11	d□□□□ ,	40	d□ænd□æ,	10	jek, æjsk
/l/	20	d□u□d□□ ,	20	d□□d□□	13	gol, hol□, bu□l
/m/	29	d□□□s	30	æks	31	b□:lom, hæmem
/n/	00	k□□se ,	00	lel□□ ,	06	henhen, næn,
/P/	13	l□□p, 1□:1□:,	14	h□□bol□:,	07	s□:bon
/s/	36	lel□□	18	æm□:,	00	dep, du:p, 1□□p,
/t/	01	m□□n□:,m□:m	00	hæmhæm	00	tep
/v/	00	□:, mæne	10	henænæ, ennæ	06	æks, eses, dæs
/z/	02	n□□n, n□□qol,	00	------------------	12	----------------------
/x/	12	n□□n□□	21	---	14	--
/q/	11	--------------------	10	sæsæl□:,	00	----------------------
/j/	00	-	00	k□:sə,	03	--
/□/	05	s□□bon,	04	ot□□d,□□t□□	13	t□:z, æzez
/ʃ/ /tʃ /	03	s□□□:, sæde tu□tu□, t□□b, t□□d□: væf -------------------- ---- xod□: qæd□:, q□: q□:, qæd jæj□□, jek, j□:j□:	00	z, ------------------- --- æb□:z□:, æbze ------------------ - n□□qol□:, bæqæ d□:j□□,æjsk, æje□□ -------------------	00	t□æx, j□:x, deæx, q□:doq, bæq, bu:q ---------------------- -- □□□□, □□□□□ d□□□□ , □□bgu:□, □:d□:□ ---------------------- -----

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----   □□□□:l,
□æb,   □æd□:d,   ------------------
□□□   ----
t□æx, t□e□

1989; Owens, 2001; Keshavarz, 2000) state, [r] is one of the late acquired sounds in English due to the intricacies in its place and manner of articulation. The late acquisition of this sound by Mahdi confirms the findings of the pervious studies, supporting the universality of this phonological development pattern.

- **Vowels**

As it is stated above, the phonological system of Farsi uses altogether six mono-phthongue vowel sounds (Vahidian Kamkar & Omrani, 2001). The six vowels are divided into two groups of short and long vowels. Using English phonetic alphabets the long

vowels are [□□], [ɪː] and [Uː] and the short vowels are [æ], [e] and [o] (ibid.).

All six vowels appeared in Mahdi's speech though their frequency was different at different positions. Figure 2 illustrates the frequency and the positional variations of the vowels in Mahdi's speech.
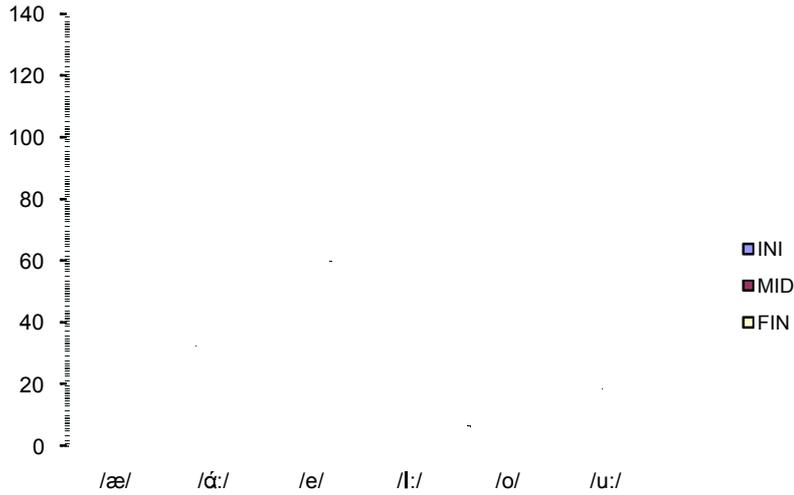

Figure 2. Vowel frequency and positional variation

As it is presented in Figure 2, the most frequent vowel sounds were short vowel [æ] and its long counterpart [□□]. Out of the six sounds [□□] did not appear at the initial position. The positional variations alongside some examples from Mahdi's speech are illustrated in Table 3.

Table 3.
Vowel Positional Variation Examples

Vowel	Initial	Middle	Final
/ æ/	æm□,	æzz, dæf, dæsu□□□,	**dædæ, bæqæ,**

	æl□□l□:,	bæq	bu□bbæ, d□ædæ
/ □□/	□□bg□□,□:t□□□, □□ne	b□□l□, b□□d, d□□do,	m⊔⊔m⊔⊔,q⊔⊔q□□, t□□bt□□, xod□:
/ e/	eses, elæl, ennæ	t□e□,neni:,henæ næ	mæne, sæbze, æb□:de,
/ □□/		d□□□□, d□□:d□□:,d□ □d□	d□:t□□, m□□n□:, æl□□l□:, □□□
/o/	ot□:d,odu□n,odd □□	qos,q□:doq,n□ □qol	d□□do, s□:bo, æl□□ho
/ u□/	u□du□, u□f,	du□□,bu:q, du□d	hæbu□, tu□tu□, u□du□

The syllabic structure of the words produced by Mahdi confirms the earlier studies (Owens ,2001, O'Grady 2005) since syllabic structure of the words he produced in his holophrastic stage of language development was in the following order: Reduplicated CVCV was used almost 39.33%, CVC was used 28.6% , CV 15.11%, VCV 8.75% , VC 6.72 % , and reduplicated VCVC almost 3.8 % . The results gained from this study concerning the syllabic structure of the words produced at single word production stage can be considered as a piece of supporting evidence ,derived from Farsi, for the universality of the aforementioned patterns of syllabic structures.

Discussion

In this study, the phonological development of a monolingual Iranian child, during six months of language (Farsi) development, has been studied. The phonological system of Farsi as an Indo-European language includes 23 consonantal and 6 vowel sounds. Except the dental fricatives /ð/ and /θ/ and the approximant /w/, Farsi shares the rest of the consonants with English. In addition to these consonant sounds, there are two other consonants in Farsi phonological system which are lacking in English. These two are the glottal stop /q/ and the glottal fricative /x/. All the consonants except /r/ were produced by the subject of the study, as it is shown in Figures 1 and 2 , and Table 1 , with their variant frequency and positional variation. The phonemes like /tʃ/, /ʒ/, /v/, /p/, and / k/ were produced relatively in very limited cases. As it is shown in Table 2, the total frequency of /tʃ/ is only 3 (3 tokens, two types) , /ʒ / three tokens and two types, /v/ only one type, /p/ six (6 tokens ,one type) in final positions of the words only, and /k/ is produced 8 times altogether in three different word positions. Even among the other more frequently used consonants, there are some phonemes that have a relatively limited positional variation. For example, /f/ has 0 frequency in initial position and only one in mid position while it is more frequently used in final position. As another example, take the phoneme /g/, which has also got 0 frequency in word final position or /t/, which has 0 frequency in word final position though relatively high frequency levels in other positions. Considering vowels, the short vowel /æ/ in its mid position and the long vowel /ɑː/ in word final position are the most frequent ones. These two vowel sounds are the ones that were much frequently used in reduplication of the monosyllabic words. The frequency and the positional variation of the other four vowels are shown in Figure 2. Reduplication is the technique which has been frequently used by the subject of the study. Examples like / dædæ/, / tu☐tuː / and / bæbæ / are among the ones that have been presented in Table 3. Reduction is the

second main phonological process which Mahdi used due to the difficulty he had in producing some syllabic structures and consonant clusters. As an example, the proper name [æfsɑneh] was reduced to [eses] or the word for "bone" [ostoxɑn] in Farsi was reduced to [odu:n]. The results mentioned above about the dominance of CVCV, CVC, and CV syllabic structures confirm the findings of the previous studies. The low proportion of the syllables with VC structure is strikingly interesting since Farsi allows for such syllabic structure. VCV, VC, and reduplicated VCVC syllables make less than 20% of the produced syllables altogether.

The Analysis of Lexical Development in Mahdi's Speech

Between eighteen up to twenty four months of age, most children experience a "vocabulary spurt" especially in receptive vocabulary (Harris, Yeels, Chasin & Oakley, 1995; Mervis &Bertrand, 1995). This finding is confirmed in the present study as well. Figure 4 clearly shows the growth rate of single word production during the six month of the study since 16 to 23 months
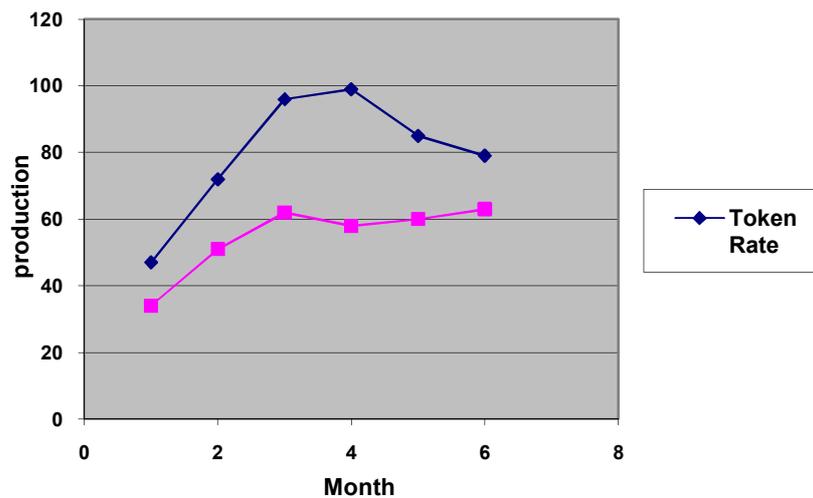

Figure 4. Type/token growth

of age). Of course, it must be pointed out that the present study is concerned with production rather than comprehension.

Both Type and token production rates in the first, second and the third months of study (17, 18, 19 months of age) show a sharp increase, well supporting the vocabulary spurt notion. The token-production rate starts with a sharp ascending growth at the beginning of the study. During the first, second, and the third months, the steep growth rate continues while in the fourth month it slows down, though still growing. At the beginning of the fifth month, however, the token-production growth rate stops, and descending begins. The type-production growth rate is a bit different. The sharp ascent is the case with the type- production growth rate, with a slight variation up to the end of the third month, but descending starts earlier, at the end of the third month, though the descent is not as sharp as it is in case of the token production, and it continues up to the end of the fourth month, which is the start of a second slight ascending rate. The token-production growth rate does not show any second ascent.

- **Noun Dominance**

As the previous studies show (Benedict, 1979; Nelson, 1973; Schwartz &Leonard, 1984, Gentner, 1982), the noun category is dominant in the early word production of holophrastic stage. Gentner (1982) claims the universality of this finding, and believes that children acquiring any language will show the noun dominance in their early word production though with slight individual variations. The present study confirms this finding since the referential noun category was strongly dominant in Mahdi's single word production at the holophrastic stage. The following figure shows the word classes and their related percentages in Mahdi's speech.
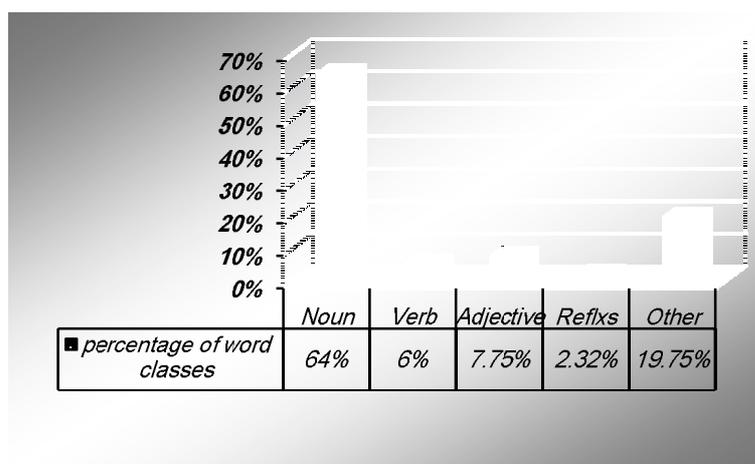
	Noun	Verb	Adjective	Reflxs	Other
■ percentage of word classes	64%	6%	7.75%	2.32%	19.75%

Figure 5. Word classes' percentage

The noun percentage is exactly at the same range of 60-65% which Benedict (1979) maintains, though the verb category, or as Benedict names "action words" makes up only 6% of the whole single words Mahdi produced. A closer look at the verbs produced by Mahdi (Table 4) shows the existence of third person singular inflection of the verbs in his speech which can be considered as a challenge to the Structure- building hypothesis (Radford, 1990, 1996).This finding shows that as Keshavarz (2007: 269) concludes: " The functional categories exist in the speech produced at the pre-categorical and lexical stages of grammar development"; however, since the present paper does not deal with the grammatical structure of the early words and phrases, the discussion about this point is beyond the scope of this paper. Nearly 19.75% of the words were utterances which were the simplified forms of child songs and formulas while 7.75 % were modifiers (adjectives) and about 3% were words which showed his feelings of pain, surprise… and are labeled here as reflexives. Table 4   below presents the total number and some examples of each one the word classes mentioned above in the subject's speech. .

Table 4.
Word Classes' Frequencies and Examples

Word Class	Freq	Examples
Noun	162	□æd□□d (Shahrzad,proper name), □æb(night), odu:n(bone), □□t□□z (fire), □□q□□(grandpa) , □□bgu:□ (broth), □□b (water)
Verb	13	ot□□d [(it) fell] , væf [(he) went], sæd̲e̲ [(it) *is* (cold)], bæde [give (it)], sefte [(it) *is* hard]
Adjective	20	n□:qol*a*: (naughty), d□□q (hot) , t□:z (sharp), æbu□f (dirty)
Onomatopoeia	15	q□□q□□ (crow sound), bæbæ (Sheep's bleating)
Reflexive words	06	□□x (ouch) , □□h (sighing) , eh (surprise word),
Other	42	æl□□hoæb (God is Almighty), t□:t□:æb□:ze (part of a child song) , æb□□z□: (a part of a child song), bæhbæh(yummy)

Based on these findings, it seems that Farsi is no exception to the noun dominance universality hypothesis. What's more, due to the fact that a great majority of the nouns which Mahdi produced were referential type nouns, it seems that he is a referential child rather than expressive And, this is the point consistent with the findings of other studies reflecting the fact that, at the early stages of single word production, children are rather universally using words to refer to objects, and hence, are more referential type than expressive (Owens, 2001; Barret, 1986; Barrett, et al., 1991; Dromi, 1987).

In addition, a large number of these referential nouns he produced were used for more referents than the adult Farsi language permits. Even the idiomorphs that he continued to coin and use were overextended to refer to several objects rather than only one. For example, he coined the word [h□□bu:l□:] to refer to "grape" at first but gradually he used the same word to refer to different types of "beans", "lentils" and the like as well. Such

overextensions, though consistently used, were dynamically revised and reformed. Some instances of the overextensions Mahdi made during the study period are presented in Table 5.

Table 5.
Overextensions

	Word	Referents
1	bæh	French Fries, tomato, food
2	hæbu:	Cow, cat, dog, darkness, grasshopper, crow
3	ot□□d	Fell, throw
4	h□□bu:l□:	Grape , beans , lentils
5	næn	Car, motorcycle, train , bicycle
6	dæs	Book, notebook, paper
7	hæmhæm	Breakfast, food , fruit
8	bæ bæ	Sheep , goat, monkey
9	bu□bbæ	Egg, frying pan
10	dæx	Meat grinder, bicycle, tricycle
11	□:ne	Glass , mirror
12	æbu□f	Diaper, litter, dirty
13	j□:j□:	Pillow, sleep
14	d□□:d□□:	Pants, shirt , any kind of clothes
15	bæq	Gas light bulb, torch, mobile light
16	d□□q	Hot , itchy spots of body

It must be added that during the whole research period the researcher did not witness any instance of under-extension in Mahdi's single word production.

Discussion

The onset of the language production of the child is considered to be the holophrastic stage through which the child tries to express him/herself using single words and utterances to refer to entities, objects and events. The stage starts with the first word production nearly at around the first birthday. The present study took place during the more or less typical holophrastic stage

since he was 16 months old until he turned 23. A great deal of consensus is found between the findings of this study and those in the literature. The rapid growth in the token and type rate of the words, produced during the first three months of the study, reflects the vocabulary spurt notion, which is said to occur in the months between eighteen and twenty four. The vocabulary spurt reported in the present study took place in the early word production while, as it is stated in the results section, previous studies reported it to occur in the comprehension of the words. Although it has not been documented in the present paper, the comprehension vocabulary spurt took place much earlier than the production vocabulary spurt.

The idiomorphs the subject continued to coin and the high rate of overextensions he used to refer to the objects and things indicate the creative nature of the child language development which goes contrary to the views that consider the imitation as the primary process of L1 acquisition.

It is reported above that the noun dominance in the early word production of the children at the holophrastic stages is supported here in this case study. The results further prove the universality of the noun dominance hypothesis. In the case of the present subject referential type nouns are more frequent than expressive nouns, the finding which enables the researcher to call his subject a referential type child, and as stated before this is the point which is consistent with the findings of other studies, reflecting the fact that at the early stages of single word production, children are rather universally using words to refer to objects, and hence, are more referential type than expressive (Owens, 2001; Barret, 1986; Barrett, et al., 1991; Dromi, 1987).

The variation observed between the percentage of the action words (verbs) which made only 6% of the words in this study and less than 20% reported by Benedict (1979) and Nelson (1973) may further pinpoint the higher tendency of the subject to name rather than to comment . The fact that the verbs which make up only 6% of the whole speech produced by the child are inflected by the third person singular inflection, and the existence of the copula among the reported verbs are reinforcing a controversial issue regarding the existence or nonexistence of inflections,

function words, and copula at the early pre-categorical and lexical stage of L1 development. According to the Structure Building Hypothesis purported by Radford (1990, 1996), such inflections do not appear in the speech at pre-categorical and lexical stages of language development, and are postponed up to nearly three years of age , while according to Keshavarz (2007) the inflections and copula emerge even at the pre-categorical stage . The verbs shown in Table 4 are taken from the corpus of the speech produced by the subject of the study, and support the "Continuity hypothesis" regarding the syntactic development of the first language.

Finally, contrary to the abundance of the overextensions in the speech that Mahdi produced, under-extension of the words was rarely observed. [Although this does not mean that the researcher neglected such cases, and did not pay attention to them intentionally. On the contrary, there was an attempt to find some examples of this process in the corpus, but except one about which the researcher felt highly skeptic, no other instance was found. This condition is replicating the same condition is reported in the pertinent literature].

Conclusion

As it is stated earlier, the study had two purposes. The first purpose was to study the peculiar individual characteristics of the language development of the subject of the study, and the second purpose one was the peculiarities and commonalities of the acquisition of Farsi as the first language at the holophrastic stage. Regarding the first aim, it was found that Mahdi, like most of the other children across the globe who are referential at this stage of language development, is a referential (nominal) child. He favored naming objects more than expressing himself using simplified formulas, since a great proportion of the speech he produced during the study period was devoted to nouns which were used to name things and objects. He could not produce the consonant sound [r] during the study period, and some other consonants like [v] were quite rare in his single word production. The late appearance of sound like [r] in Mahdi's speech supports other studies about the late acquisition of this sound. Actually, as the

previous studies (for example, Ingram ,1989; Owens,2001; Keshavarz, 2000) state, [r] is one of the late acquired sounds in English due to the intricacies in its place and manner of articulation. The late acquisition of this sound by Mahdi confirms findings regarding the universality of this phonological development pattern.

Moreover, reduplication and reduction were more prominent than the other phonological processes in his speech. The most frequent consonants in his speech were stops with different places of articulation including bilabial stop [b], dental-alveolar [d] and [t]. Following stops, lateral alveolar [l] in middle position was the second most frequent consonant and the third most frequent consonants were glottal fricative [h] and oral nasal [n]. The least frequent consonant was bilabial fricative [v] which was produced only once at the initial position. Additionally, the most dominant syllabic structures found were reduplicated CVCV, CV and CVC. There was no instance of under-extension in the speech of the subject of the study, while he used overextension to a great extent. Regarding the second purpose of the study, it seems that Gentner's noun dominance hypothesis (1982) is not violated in Farsi either, though there was a difference between the percentage of action words reported in Benedict (1979) (20%) and the findings of this study (less than 6%). The vocabulary spurt notion (Plunkett, 1993) is confirmed in the case of Mahdi too, who showed a great increasing rate at the first three months of the study .The few verbs which were spotted in the subjects' speech pose a great challenge to a well supported maturational hypothesis (structure building hypothesis) since the third person singular inflection and the copula are shown to be used in the holophrastic single word production of a monolingual Farsi learner, who is at the lexical stage of language development. The idea supports the "continuity hypothesis" regarding the syntactic development in the course of Farsi language development.

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* **CHILDES** (Child Language Data Exchange System)

CHAT (Codes for the Human Analysis of Transcripts): The format for transcribing speech. It is needed to use the CHAT format in order to analyze your transcripts with CLAN.

CLAN (Computerized Language Analysis): The program for analyzing transcripts written in the CHAT format.

CHILDES website <http://childes.psy.cmu.edu>

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