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## Original Article

## Comparing “Mean Length of Utterance” and “Mean Length of Five Phrasal Utterances” between 2-To-5 Year-Old Normal Farsi-Speaking Children

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### ABSTRACT

**Background:** Since most clinical treatments of Persian children’s language impairments are based on either the therapist, clinicians’ experiences (mostly), or English language norms (sometimes), comparing two minor indices of speech quality, namely “mean Length of Utterance” (MLU) and “mean length of five phrasal utterances” (MLFPU) between different age groups of children, would be unequivocally efficient to help diagnose and treat Farsi-Speaking Children with language impairments.

**Methods:** To compare the two mentioned indices of 2 to 5-year-old normal Farsi-speaking children, the speech samples of 500 children were scrutinized by elicitation, transcription, and statistically analyzing their language samples.

**Results:** The net results prove that as the children’s ages grow from 2 to 5, the two mentioned indices increase and extend as well.

**Conclusion:** The influence of chronological age on the indices varies, regarding the type of language samples. Hence, the analysis of speech quality indices in assessment of children’s language ability has to be performed based on the language sampling methods.

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### Introduction

Language sampling forms an important part of the language evaluation protocol. Southwood and Russell, quoted from Lahi and Elexiok-Wales in 1984, believe that because of the limitations of standardized language tests, their results have to be fulfilled by the spontaneous speech sample, especially in order to create an appropriate therapy protocol [1-4].

There are different approaches for language data collecting that have been debated so far; among them, the 3 methods of its elicitation are conversation (CV), free play (FP), and story generation (SG) [4]. On the other

hand, there is old literature that supports tests related to different aspects of children’s speech development that are measured by calculating the quantitative criteria (or indices) of spontaneous language samples [5]. According to Nilipour, speech quality indices are one of the most significant factors to evaluate the quality and quantity of speech impairments. To achieve this purpose, he has described 5 major indices: speech fluency, speech accuracy, accessible vocabularies, speech complexity, and speech rate. The first four indices could be clarified and measured through some minor indicators; however, speech rate would be calculated only based on a minor index, that is, number of words in a minute. The minor indicators are total number of vocabulary words, mean length of utterances, mean length of 5 phrasal utterances, mean number of verbs in sentence, mean number of subordinate clauses in sentence, richness of vocabulary, and number of vocabulary words in a minute [6, 7].

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During the last decades, various studies have been done in this field, and we have reviewed some here. Among them, it must be mentioned one of the earliest one namely, Miller and Chapman who presented the MLU and age equivalent of 123 17-59 months English children. They found that not only child's expressive language ability progress based on an increasing line, but the age associated with a given MLU could be predicted [8].

Hewitt et al. scrutinized 54 preschool English children, including 27 normally- developing children and 27 a with specific language impairment (SLI). By comparing their language samples, they concluded that the mean scores on language sample measures are lower for 6-year-old children with SLI than the children who are normally developing. Also, they found that the full diagnostic potential of any language sample measure will not be realized until it has been compared to normative information on a large scale [9].

Williamson confirmed the previous findings and verified that as the children mature, their MLU increases. Also, he believes that MLU have to be calculated based on morphemes rather than words. He has proposed a protocol for calculating the MLU and its normative data to age equivalent too [10].

Comparing the present study with others which have been done in Iran, it seems that the samples of other studies are not sufficient, and it has examined only one of the three indices of "mean length of utterances", "mean length of 5 phrasal utterances", or "mean number of verbs in utterances" in Farsi-speaking children.

For example, Oryadi et al. in 2012 scrutinized 30 seven-year-old girls who have been students in first grade to determine their MLU through picture description and storytelling. As they concluded, the amounts of MLU resulting from both methods are relatively similar [11].

Jalilvand et al., in a research on two Farsi-speaking children (to achieve their MLU and grammatical morphemes), concluded that the speech development in Farsi-speaking children follows the same pattern as other children, starting from one-word utterances and gradually increasing the number of words, word combinations, and using grammatical morphemes. They also mentioned that the samples started to use grammatical morphemes when their mean length of utterance was lower than two morphemes [12].

Oryadi and Ghorbani examined a research dealing with speech indices in 90 4-5 year-old Farsi-speaking children from two different cities, and their findings have been applied in the present research as a primary study. However, the major result was that dialect and accent have a significant influence on the children's MLU [13].

Therefore, the amounts of the achieved indices are not so completed that could be generalized into all Farsi-speaking children, and due to loss of norms of these indices, the results would not be practical or applicable formally in clinical projects.

In the present study, the authors compared the amounts of two indices as MLU and MLFPU in language samples of Farsi-speaking children ranged from 2-to-5 years old, which have been acquired through conversation with

them. The first reason for the limitation of the age of children was the critical period of language development, which will appear during this time. Second, all of the probable developmental language disorders would appear and continue in this period of time. Thus, the majority of clients who request help from speech therapy clinics are 2-to-5 years old. Considering the fact that common clinical treatments of language impairments for Persian children are based on either the therapist experiences (mostly) or English language norms (sometimes), it seems that such comparisons could lead to promote evaluation, diagnosis, and intervention of Farsi-Speaking Children who suffer from language impairments.

## Methods

500 2-to-5 year-old normal Farsi-Speaking Children living in Tehran, the capital city of Iran, were recruited in this study. They were accomplished through cluster sampling method, and clusters were selected by systematic approach. To clarify whether or not their language development appears to be normal and natural, their life histories were obtained through discussion with their parents. In addition, the participants' communication skills were evaluated by screening developmental checklists. Language sampling was conducted after verifying that the children's language development had been intact. Language samples were collected through conversation techniques, which included free speech and descriptive speech. Some pictures and storybooks were used to collect the descriptive speech samples, and some general questions were applied to obtain the free speech samples.

The children's speech was recorded by a sound recorder during the conversation. Afterwards, the recorded speech samples were exactly transcribed by the International Phonetic Alphabet (IPA), then the transcribed language samples were analyzed linguistically to calculate MLU and MLFPU. It must be mentioned that MLU has been calculated in a word-based method, rather than morpheme-based one.

### Statistical Analysis

At last, the data were analyzed through some statistical tests including ANOVA, Kruskal- Wallis, and Kolmogorov-Smirnov.

## Results

Mean and confidence interval of 95% of the mean for MLU and MLFPU of the descriptive language samples have been shown in the Table 1. There was a significant difference between the four age groups in regard to MLU and MLFPU in their descriptive language samples ( $P<0.001$ ).

Mean and confidence interval of 95% of the mean for MLU and MLFPU of the free language samples have been shown in the Table 2. There was a significant difference between the four age groups in regard to MLU and MLFPU in their free language samples ( $P<0.001$ ).

**Table 1:** Compares the means of MLU and MLFPU in descriptive language samples of 2-5 year-old Farsi-speaking children

Indices	Age	Mean	Confidence interval of 95% for mean		Standard deviation	P value
			Minimum	Maximum		
MLU	2	1.90	1.72	2.07	0.70	0.000
	3	2.30	2.13	2.46	0.96	
	4	2.35	2.21	2.49	0.92	
	5	2.56	2.44	2.68	0.90	
MLFPU	2	3.93	3.57	4.28	1.41	0.000
	3	5.08	4.74	5.42	1.98	
	4	5.66	5.37	5.94	1.87	
	5	6.07	5.77	6.38	2.26	

**Table 2:** compares the means of MLU and MLFPU in free language samples of 2-5 year- old Farsi-speaking children

Indices	Age	Mean	Confidence interval of 95% for mean		Standard deviation	P value
			Minimum	Maximum		
MLU	2	1.87	1.72	2.02	0.60	0.000
	3	2.10	1.98	2.23	0.74	
	4	2.10	1.98	2.22	0.80	
	5	2.36	2.24	2.48	0.89	
MLFPU	2	3.54	3.20	3.87	1.34	0.000
	3	4.52	4.18	4.87	1.20	
	4	4.71	4.38	5.04	2.17	
	5	5.53	5.14	5.92	2.87	

**Discussion**

According to the acquired results of the study, as the children are growing from 2 to 5 years old, their MLU is increasing too (Table 3). This outcome confirms the findings of Miller in 1981 [8], Brown & Bowen in 1998 [14], Chengappa, Bhat and Hiwarale in 2002 [15], and Klee et al. in 2004 [5], who all verified the significant relation between MLU and age.

The subjects' ages of the study ranged from 2 to 5, and they have been sorted into four groups of 2, 3, 4, and 5-year-old children. As according to Klee et al. in 2004, the studies accomplished by Brown in 1973, Miller and Chapman in 1981, and Aleen et al. in 1999 [14], used subjects whose age ranged from 4 to 5. This means that 4-year-old children had been categorized and studied in a 3-month interval. Therefore, the major difference between MLU development phases in this study and other studies is due to the children's categorization of their ages. Also, in Brown's research, MLU was measured based on morphemes, but in the present study, it is based on words.

Generally, the results of this study confirm the findings of other research done by Miller and Chapman [8], Klee et al. [17], Blake et al. [16], and other aforementioned studies, which all verified that there is a significant correlation between MLU and age in children with normal language abilities.

The study's findings show that as the children are growing from 2 to 5 years old, MLFPU is increasing systematically (Table 4).

There is no significant correlation between MLU and MLFPU. Accordingly, we cannot say that the children with higher MLU could be better in the mean length of 5 phrasal utterances; however, as it is expected, this result represents that every utterance would be a sentence or a smaller unit in 2 to 5-year-old children. Therefore, the conclusion is that the numbers of sentences and utterances would not be equal.

**Conclusion**

It has been concluded that the developmental age is an

**Table 3:** The growth stages of MLU in 2-to-5 year-old normal Farsi-speaking children

Growth stages	Age in month	MLU based on word	Confidence interval of 95% for mean
I	24-36	1.88	1.77-2.00
II	36-60	2.21	2.10-2.32
III	60-72	2.46	2.37-2.55

**Table 4:** The growth stages of MLFPU in 2-to-5 year-old normal Farsi-speaking children

Growth stages	Age in month	MLFPU based on word	Confidence interval of 95% for mean
I	24-36	3.73	3.49-3.97
II	36-48	4.80	4.56-5.04
III	48-60	5.18	4.96-5.41
IV	60-72	5.80	5.55-6.05

effective factor on MLU and MLFPU. On the other hand, comparing the indices of free and descriptive language samples of 2-to-5 year-old normal Farsi-speaking children indicates that the influence of the developmental age on MLU and MLFPU varies based on the method of language sampling. Therefore, the growth stages of these indices would vary as well, according to the children's language sampling, while they grow from 2 to 5.

In addition, speech therapists can practically utilize the norms of MLU and MLFPU to evaluate, diagnose, and treat any developmental language impairments in 2-to-5 year-old Farsi-speaking children.

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**Conflict of Interest:** None declared.

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