



## Original Article

## Sentence Repetition Task as a Measure to Detect Developmental Language Disorder in Persian

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### ABSTRACT

**Background:** Developmental language disorder (DLD) is a common disorder in childhood. The aim of this study was to investigate the performance of Persian-speaking children on sentence repetition task (SRT) as a measure to detect DLD.

**Methods:** As a cross-sectional and observational study, seven 5-to-7-year-old Persian-speaking children with DLD and thirty normal peers were studied using the Persian version of test of language development (TOLD-P: 3) as a diagnostic test and SRT. The performances of the two groups on the SRT were compared by statistical tests at the significance level of 0.05.

**Results:** The SRT scores of the children suspected of having DLD and their normal peers were significantly different ( $P < 0.05$ ). Indeed, there was a significant difference between the groups in terms of mean scores of prepositions ( $P < 0.01$ ), conjunctions ( $P < 0.01$ ), plural case ( $P < 0.01$ ), subject-verb agreement ( $P < 0.05$ ), and word order ( $P < 0.05$ ).

**Conclusion:** The SRT can be used as a promising measure for early detection and intervention of Persian-speaking children with DLD.

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### Introduction

Developmental language disorder (DLD) is a common developmental disorder during childhood, the long-term consequences of which cause problems for affected people during their adult years [1]. According to foreign and Iranian studies, the global prevalence of DLD is 3-6% [2], and its prevalence among Persian-speaking children is estimated to be 3-4% [3, 4].

DLD is a developmental disorder not associated with a known medical pathology such as brain lesions, progressive neurological disorders, cerebral palsy, or genetic and neurological disorders. Nevertheless, its diagnosis is not ruled out with the presence of high-risk environmental, neurological disorders or comorbidity

with other neurodevelopmental disorders [1]. The primary predictors of this disorder include delay in the development of perceptive and expressive lexicon as well as delay in syntax comprehension up to the age of 30 months. Nevertheless, the optimal age for its definite diagnosis is the end of 4 years [5]. This disorder can affect receptive language, expressive language, or both concurrently with varying degrees. Damage can occur in various aspects of language processing, including lexicon, grammar (syntax/morphology), or pragmatics, causing speech/language delay [6]. The results of studies in Persian have shown that children with DLD, when compared with their normal peers, have lower mean length of utterance (MLU) [7]. They also have constraints in word definition, syntax development, lexical development, morphosyntax structure development, and use of morphemes such as verbal inflections. The percentage of syntactic term usage in their speech is considerably lower, and they perform more poorly in

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narrative coherence [8-10]. According to Stark and Tallal, delay in speech and language among English-speaking children with this disorder based on the NSST linguistic test in productive and receptive language is estimated to be at least 12 and 6 months, respectively [11].

In case of late diagnosis and treatment, these children gradually develop personal, familial, and social problems, which can also compromise the psychological health of the person and their family [1, 12, 13]. Thus, early diagnosis and, in turn, early initiation of rehabilitation interventions in these children would facilitate and accelerate their learning of linguistic skills and help mitigate the long-term consequences resulting from DLD at older ages. Various instruments are used to diagnose children with DLD. Nevertheless, in recent years, the use of standard language tests has become popular because of advantages such as identity of method used and scoring, minimum influence of the tester and test conditions, interpretable results for researchers, and no need to prepare for each subject separately [14]. Meanwhile, despite the existence of a large variety of language tests used to diagnose children with this disorder in other languages [15], the Persian version of the test of language development (TOLD-P: 3) is the only standard assessment tool used to date to diagnose Persian-speaking children with this disorder in the limited studies performed on these children. Research results have shown that this test enjoys a relatively high ability in diagnosing Persian-speaking children with DLD [3, 4, 16]. Nevertheless, many researchers, considering the wide extent of linguistic damage in children with DLD as well as the limited data resulting from a language test, have emphasized the necessity and importance of applying more than one test to attain a relatively accurate diagnosis in children with DLD [17]; even though any assessment tool alone could have errors in diagnosis, combining the data resulting from different tests can largely prevent the incidence of diagnostic errors [18].

TOLD-P:3 is a norm-referenced assessment tool for evaluating the productive or expressive linguistic skills of Persian-speaking children. It consists of nine subtests (six primary subtests and three secondary subtests) designed to evaluate the syntactic, semantic, and phonological features of subjects [19]. Nevertheless, TOLD-P:3 has limitations, complicating its usage for researchers and therapists, including being time- and labor-intensive for implementing and interpreting the results, time-consuming for children initiating their noncooperation, the necessity of complete mastery of the tester over the content, method of implementation, and method of interpreting the test scores, as well as the absence of a new Persian version of this test, despite new editions of the English version [20, 21]. Alongside norm-referenced tests, some criterion-referenced language assessment tools have also been introduced as effective tools for diagnosing children with DLD, including nonword repetition and sentence repetition [22, 23].

Sentence repetition is a tool for evaluating language performance, including syntax/grammar, semantic, and phonological areas [24]. In addition, when there are time constraints on language assessment, this task is a useful

solution, allowing therapists to detect the linguistic abilities of child within a shorter time [25, 26]. Various studies have evaluated the ability of sentence repetition in the diagnosis of children with DLD in different languages [22, 23, 27, 28]. In this regard, the results of studies have indicated the ability of sentence repetition among English-speaking children, with sentence repetition being an effective tool in diagnosis of children with DLD [29]. Leclercq et al. examined the accuracy and sensitivity of the SRT in diagnosing children with DLD. Their results showed the high diagnostic accuracy of the SRT for all sentence components in French [30]. In another research, the findings of studies done on sentence repetition ability among Italian children suggested that sentence repetition had greater effectiveness than TOLD-P:3 in diagnosing DLD among Italian children [31]. The results of studies in other languages have also confirmed that sentence repetition has great ability in diagnosing children with DLD in children speaking various languages, such as Arabic [23], Cantonese [22], Russian – Hebrew [32], Danish [27], and Vietnamese [28]. Thus, it can be concluded that sentence repetition can be used as a valid assessment tool for diagnosing children with DLD.

According to a review of the literature discussed above, no study to date has been performed on Persian-speaking children in this regard. Thus, the present study aimed to estimate the sentence repetition ability in diagnosing Persian-speaking children with DLD, assuming that sentence repetition can indicate the language developmental differences of morphosyntax between Persian-speaking children suffering from DLD and their normal peers.

## Methods

This study was a cross-sectional, observational, and analytical research approved by the Ethics Committee of Shiraz University of Medical Sciences (IR.SUMS.REC.1395.S229). Informed consent was obtained from the parents of the children participating in the study. The studied population consisted of 5-7-year-old Persian-speaking children with DLD and their normal peers. The inclusion criteria for children with DLD were calendar age, being Persian-speaking, clinical diagnosis of DLD by a speech and language pathologist, and the absence of other communication or developmental disorders. The inclusion criteria for the normal children comprised chronological age, being Persian-speaking, and the absence of communication or other developmental disorders.

In the first stage, based on the inclusion criteria, seven 5-7-year-old children (three girls and four boys) with an initial diagnosis of DLD referring to the clinic of Faculty of Rehabilitation Sciences, Shiraz University of Medical Sciences, were identified. Using available sampling, 30 normal children (20 girls and 10 boys) were chosen from a preschool education center in Shiraz. In the second stage, four TOLD-P:3 subscales, i.e. picture vocabulary, oral vocabulary, grammatic understanding, and grammatic completion, were used to measure the subjects' listening and speaking skills; if the listening or speaking coefficient of the subject was  $-1.25$  SD

lower than the mean, based on the EpiSLI system [33], a diagnosis of DLD was made. Eventually, two out of seven children with a primary DLD diagnosis based on the EpiSLI system were again diagnosed to have DLD in the second stage. Based on the results obtained from previous studies regarding the ability of SRT in diagnosing children with DLD in different languages [22, 23, 27, 28], five children who were not diagnosed as having DLD based on the TOLD-P:3 test were again included in the final stage of the study. The aim was to examine their performance in the SRT considering the history of language deficiencies in these children. Thus, in the final stage, SRT [25] was done on both normal children and those with DLD.

The SRT has 38 sentences which, along with an image related to each sentence, are played individually for the child, whereby the child should repeat each sentence accurately. The task scoring includes four parts: content words (including nouns and verbs), functional words (including prepositions, conjunctions, plural case, and tense of verbs), syntax (adhering to the proper order of words in the sentence), and subject-verb agreement (part of Persian grammar). Complete repetition of the sentence receives a score of 2, while incomplete repetition receives a score of 1. The total sum of scores in case of complete repetition of all sentences will be 478 [25].

After establishing communication with the child and explaining the task, the tester presented two sample sentences to explain the procedure, and eventually, after thoroughly ensuring the subject's understanding of the response to test and their preparation, the task was initiated. During the task, sentences were presented only once and with no guidance. The task was implemented by three B.Sc. students of speech therapy, who had been trained on task implementation. Note that the task was administered in a suitable place with no noise and individually for each child. In addition to the tester writing down each child's responses on an answer sheet, each child's voice was also recorded. Eventually, the registered sentences were matched against the child's voice and then analyzed after confirmation. For data analysis, considering the small sample size and abnormal data distribution, the Mann-Whitney U test nonparametric test was used.

**Results**

Table 1 reports the results obtained from analysis of the data related to examining the mean score, standard

deviation, and the mean difference between the scores of DLD and normal children in sentence repetition. As seen, a significant difference exists between children with DLD and their healthy peers in the mean scores of SRT ( $P < 0.05$ ). In other words, the ability of sentence repetition was lower in children with DLD than in their normal counterparts. According to the information presented in Table 2, significant differences were observed between normal children and those with DLD in the mean scores of prepositions ( $P < 0.01$ ), conjunctions ( $P < 0.01$ ), plural case ( $P < 0.01$ ), subject-verb agreement ( $P < 0.05$ ), and order of words ( $P < 0.05$ ). Indeed, these scores were lower in children with DLD compared with their normal peers. However, the mean difference of noun, verb, and verb tense scores was not significant between the two groups ( $P > 0.05$ ).

**Discussion**

Based on the findings obtained from the SRT, all seven children with a primary diagnosis of DLD performed significantly lower on the SRT compared with the normal children group. These findings concur with the results of Devescovi regarding the higher diagnostic accuracy of the SRT in comparison with TOLD-P:3 for diagnosing children with DLD [31]. Furthermore, the results obtained in this study confirm that the data resulting from a language test is limited and error-prone, while the combination of data resulting from more than one language test is essential for a relatively accurate diagnosis of children with DLD [17, 18].

Because a person's performance in sentence repetition depends on the knowledge of syntax, grammar, and vocabulary, the SRT is a challenging task for children with DLD, because lexical, syntactic, and grammar deficiencies are the main problems for these children [8, 9, 23, 34, 35]. In this regard, analysis of the sentence repetition performance among Persian-speaking children with DLD indicated that the mean scores of some components of this task were significantly lower than in normal peers, including prepositions, conjunctions, plural case, subject-verb agreement, and proper order of words in a sentence. These findings are in line with the results obtained from previous studies [8, 9, 23, 34, 35]. Thus, the findings of this study showed that the SRT among Persian-speaking children, as with children speaking other languages [22, 23, 27-31], can be used as a measure to detect children with DLD and identify the weak points of language development in these children.

**Table 1:** Comparison of the mean scores of the sentence repetition task in TD and DLD groups

Group	N	Mean	Standard deviation	Minimum	Maximum	U	P
TD*	30	458.50	18.74	338	476	32	0.003
DLD#	7	395.14	83.07	228	461		

\* typically development; # developmental language disorder

**Table 2:** Comparison of the mean scores of the sentence repetition task in TD and DLD groups based on parts of speech

Group	N	Prepositions		Conjunctions		Plural case		Subject-verb agreement		Order of words		Noun		Verb		Verb tense	
		U	P	U	P	U	P	U	P	U	P	U	P	U	P		
TD*	30	18	0.000	41	0.011	16.5	0.000	47.5	0.023	54	0.049	6.5	0.084	66	0.138	63.5	0.109
DLD#	7																

\* typically development; # developmental language disorder

As such, it seems that considering the importance of early detection of DLD and intervention for preventing incidence of ensuing social, emotional, behavioral, and academic problems in these children [1], and given the time-consuming nature of implementation as well as interpretation plus the lower diagnostic accuracy of the TOLD-P:3 test and the lack of cooperation of subjects due to fatigue arising from its large number of items, the SRT can be considered as a criterion-referenced assessment tool for the detection and determination of language deficiencies in Persian-speaking children with DLD.

The small sample size was a limitation in this research. As such, replication of this research with a larger sample size is suggested.

## Conclusion

The findings of the present study indicated that the SRT can be used as a promising measure to detect DLD in Persian-speaking children and provide early referral of these children to speech and language pathologists during the sensitive preschool ages.

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**Conflict of Interest:** None declared.

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