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Story retelling skills in Persian speaking hearing-impaired children



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ABSTRACT

Objectives: Since the pragmatic skills of hearing-impaired Persian-speaking children have not yet been investigated particularly through story retelling, this study aimed to evaluate some pragmatic abilities of normal-hearing and hearing-impaired children using a story retelling test.

Methods: 15 normal-hearing and 15 profound hearing-impaired 7-year-old children were evaluated using the story retelling test with the content validity of 89%, construct validity of 85%, and reliability of 83%. Three macro structure criteria including topic maintenance, event sequencing, explicitness, and four macro structure criteria including referencing, conjunctive cohesion, syntax complexity, and utterance length were assessed. The test was performed with live voice in a quiet room where children were then asked to retell the story. The tasks of the children were recorded on a tape, transcribed, scored and analyzed.

Results: In the macro structure criteria, utterances of hearing-impaired students were less consistent, enough information was not given to listeners to have a full understanding of the subject, and the story events were less frequently expressed in a rational order than those of normal-hearing group ($P < 0.0001$). Regarding the macro structure criteria of the test, unlike the normal-hearing students who obtained high scores, hearing-impaired students failed to gain any scores on the items of this section.

Conclusions: These results suggest that Hearing-impaired children were not able to use language as effectively as their hearing peers, and they utilized quite different pragmatic functions.

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1. Introduction

In recent years, there has been an increasing interest in seeking ways to evaluate children's language in a natural context. In Iran the study of language development skills in hearing impaired children is mainly focused on the development of early language skills and story retelling creates a valid way for assessing the effects of cochlear implant on complex linguistic use such as pragmatics. Pragmatic abilities, which refer to the actual use of language, are an important area in language. A number of researchers have reported

that story retelling creates a valid way for assessing pragmatic and complex structures [1].

Compared with other language tests, storytelling provides professionals with more information because it is a type of speech with descriptions and commentary, which requires complex skills and abilities, including congruence between auditory and visual inputs, attention and concentration, listening, comprehension, memory, sentence formulation and understanding of the plot [2]. The analysis of storytelling provides a comprehensive picture of the child's pragmatic skills. In addition, children's pragmatic skills and difficulties can be screened easily and quickly through storytelling [2,3]. Analysis of storytelling can be employed as the best tool for screening permanent language disorders. Most preschool-aged children who fulfill the task poorly will show this flaw as a persistent academic impairment later in life [4].

Concerning the acquisition of reading and writing skills as well as those of social and communication, storytelling is also of

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importance. This method is widely applicable and has long been recognized. It activates the cognitive organization in the mind that is not accessible with observations and normal experimental tests [5]. Not only is it a useful and flexible tool for evaluating various linguistic defects, but also it can provide an accurate prognosis about the future of academic skills for the family and therapists [6].

As one of the subsets of storytelling, retelling a story is considered as a method of evaluation that can assess the form, content and pragmatic aspects of language inclusively [7]. In story retelling assessment, two aspects of macro and micro structures are investigated. Macro-structural elements consist of more general dimensions of the story, i.e. topic maintenance, explicitness, and event sequencing, the evaluation of which provides an overall outlook of the child's storytelling ability. In contrast, micro-structural elements comprise more subtle dimensions including conjunctive cohesion, referencing, syntax complexity, and utterance length [8,9].

Despite the aforementioned importance of analyzing story retelling, among various studies conducted on communication problems in hearing impaired children, particularly in the field of pragmatics [10], only very few studies have addressed the retelling aspect of stories [11]. In Persian language, similarly, little research has exclusively been conducted on pragmatics in children [12]. Accordingly, a preliminary study was carried out in this area by Ref. [13] in which, description of the pragmatic abilities of hearing impaired children was provided by five criteria of the story retelling test (including topic maintenance, explicitness, event sequencing, referencing and conjunctive cohesion). In their preliminary study, they investigated the pragmatic skills of 5 children (3 hearing impaired and 2 normal hearing children). They reported that the pragmatic skills of hearing impaired children were weaker than hearing children. They also pointed out the differences among hearing-impaired children's abilities. The difference in pragmatic skills showed the difference in the amount of hearing loss, kind of assistive device, effective use of remaining hearing, onset and quality of aural rehabilitation program, and other factors [13]. Apart from Jarollahi et al. there is a general lack of research in pragmatic skills of Persian hearing impaired children [13]. Therefore, This study seeks to obtain data with larger and more homogeneous samples in order to be more effectively used in education and rehabilitation of children. The present study aims to compare some pragmatic abilities of normal-hearing and hearing-impaired children using a story retelling test.

2. Methods

This comparative cross-sectional study was carried out to investigate the linguistic structure of 15 children with severe-to-profound severe sensorineural hearing loss (SNHL) and 15 normal hearing children using the story retelling test. All of the children were monolingual and Persian-speaking and met the following inclusion criteria: Their parents in both groups all had normal hearing. For all children with normal hearing, hearing was screened at 20 dB hearing level for the frequencies between 500 Hz and 2000 Hz at the time of data collection. Persian was the native language of all subjects. Control group children had normal hearing threshold in both ears. According to the medical records, children in both groups were excluded if they had history of delay in psychomotor milestones or history of diseases such as otitis media, epilepsy, convulsion, syncope and brain damage. Normal hearing children had no history of language impairment. The experimental group, on the contrary, were hearing-impaired and suffered from severe-to-profound SNHL as well as speech and language disorders caused by hearing loss, but not from further physical and mental disorders.

In the normal hearing and hearing-impaired groups, 47% (7 children) and 40% (6 children) were female, respectively, and the rest were male. Within the hearing-impaired group, 40% had been wearing bilateral behind-the-ear hearing aids (6 children). The mean hearing loss at the frequencies of 500 and 1000 Hz, with no hearing aids, was 87.8 dB (ranging from 75 dB to 110 dB); on average they had been wearing hearing aid for 42 months and receiving rehabilitation services for 38 months. Some 60% had cochlear implants (9 children). The mean hearing loss at the frequencies of 500 and 1000 Hz before implantation was 100.8 dB (ranging from 90 dB to 110 dB); on average, they had been using implanted prosthesis for 16 months, and had received rehabilitation services for 29 months before and after implantation at the time of testing. Approximately, 55.5% would go to ordinary schools and the rest to deaf schools. 15 normal hearing children (8 boys and 7 girls) between the ages of 80 and 88 months ($M = 83.4$, $SD = 2.8$) and hearing-impaired children (9 boys and 6 girls) between the age of 80 and 89 months ($M = 84.4$, $SD = 3.5$) participated in the study. Of these, 6 hearing-impaired children wore hearing aid and 9 used cochlear implant. Duration of the use of hearing aid was 42 months and duration of the use of CI was 16 months. The History of aural rehabilitation duration mean in both groups (children with hearing aid and cochlear implanted children) was 32.8 ± 10.8 .

To select the samples above, all students in two Baghchehban schools and Amir-Alam cochlear implant center in Tehran were chosen by one trained tester. Additionally, two regular schools were randomly selected from the same school districts among which the schools for hearing-impaired students had been selected. Samples of convenience who met the inclusion criteria were selected. After obtaining their parents' consent, the "story retelling test" was then carried out [14]. The test is developed for assessment of some expressive language skills of 6–7 years old children. The story which is called "naughty elephant" has a simple design and contains diverse content words which are acquired earlier in development. It consists of ten complex sentences, 8 types of conjunctions, 18 main information and ten sequencing events. The story has 10 pictures illustrated by professional cartoonist. Although the story is new for hearing impaired and Normal hearing children, the pictures and the subject is attractive for them. Children listen to the story while simultaneously demonstrating the actions with pictures. Ethical issues before and during the assessment procedure were considered. The test was done in a quiet setting with no distracting factors, with a live voice presentation. Trained to perform the test and the scoring competently enough, the examiner initially established rapport with students and then explained them how to do the test. To make the children become familiar with the procedure, a pilot story the structure of which was quite consistent with the original one was first narrated as the pretest to each child. Then, after recounting the original story, the children were asked to retell it.

In the story retelling test described above, with the content validity of 89%, construct validity of 85%, and reliability of 83%, seven linguistic features were analyzed and evaluated in the micro and macro structure subtests. Below are the criteria and the way they are scored [14]:

- * **Topic maintenance:** whether or not most utterances of the child have topic coherence. A minimum score or weighted percentage of zero (<25%) and a maximum score of five (>75%) were assigned to it.
- * **Event sequencing:** whether the majority of events are arranged in a logical order. A minimum score of zero and a maximum score of ten were assigned to it.
- * **Explicitness:** whether enough information has been presented to the listener so as to make them fully understand the issue.

Minimum and maximum scores of zero and eighteen were assigned to it, respectively.

* **Referencing:** whether appropriate references to individuals, properties, and events were used or not. A minimum score of zero and a maximum score of ten were assigned to it.

* **Conjunctive cohesion:** whether semantic and pragmatic relations were properly used. A minimum score of zero and a maximum score of eight were assigned to this feature.

* **Syntax complexity:** the extent to which subordinating conjunctions were used. A minimum score of zero and a maximum score of ten were assigned to it.

* **Utterance length:** was calculated in terms of the average number of morpheme presented in a sentence. Here, five lengthy sentences uttered were selected to calculate the average. A minimum score of zero and a maximum score of fifteen were assigned to this feature.

The three criteria of topic maintenance, event sequencing and explicitness account for the macro structure sector of the test, with a total score of 33. The four criteria of referencing, conjunctive cohesion, syntax complexity and utterance length constitute the micro structure sector of the test, with a total score of 43. Thus, the overall score of the test would be 76. As well as being presented in percentages, the test scores were measured by their weight (ranking). For each criterion, if the scores were $\leq 25\%$, $25-50\%$, $50-75\%$ and $\geq 75\%$, the weights (ranking) of 1–4 were assigned to them, respectively. Ranking was used because of the differences in scores of each part of the test. The data collected from the test were compared and statistically analyzed using SPSS version 17. Nonparametric Mann-Whitney *U* test was used for the statistical analysis. The significance level of 0.05 was set for the study.

3. Results

To assess the pragmatic abilities of the homogeneous hearing and hearing-impaired children, this study was performed using the story retelling pictured test. Seven linguistic criteria were examined and compared between the two groups. Table 1 presents comparisons of the two groups of hearing and hearing-impaired children in seven criteria of the test.

Investigation of the topic maintenance criterion showed that the utterances of the students with hearing loss was less coherent than those belonging to the normal hearing group, which was statistically significant ($p < 0.001$).

Compared with the hearing group, hearing impaired students did not provide enough information for listeners so as to completely understand the topic, which was again statistically significant ($p < 0.001$).

Compared to the hearing students, those with the hearing loss

expressed the story events in a less logical order, and the difference was statistically significant ($p < 0.000$) (see Table 1). Fig. 1 shows weighted percentages of topic maintenance, explicitness and event sequencing in normal hearing and hearing-impaired student.

Analysis of the total score of macro structures in the story retelling test indicated that there existed a significant difference between the two groups of hearing and hearing-impaired students ($p < 0.001$) so that the latter performed much poorly than the former (see Table 1). Fig. 2 shows weighted percentages of total score of macro structure in normal hearing and hearing-impaired students.

While the normal hearing group achieved excellent scores at the micro structure criteria of the test (i.e. referencing, conjunctive cohesion and syntax complexity) (see Table 1), 87% of the hearing-impaired group gained no advantage, and only one participant scored rating 9 (out of 16) and two others could achieve rating 1 (out of 4) only on the use of conjunctions. All of the three participants were from the group of cochlear implant users.

4. Discussion

The present study was designed to compare story retelling skills of normal hearing and hearing-impaired students in two levels of macro and micro structures. The three criteria of topic maintenance, event sequencing and explicitness account for the macro structure sector of the test and The four criteria of referencing, conjunctive cohesion, syntax complexity, and utterance length.

The results of the present study indicate that firstly, the majority of the utterances produced by the hearing impaired children lacked

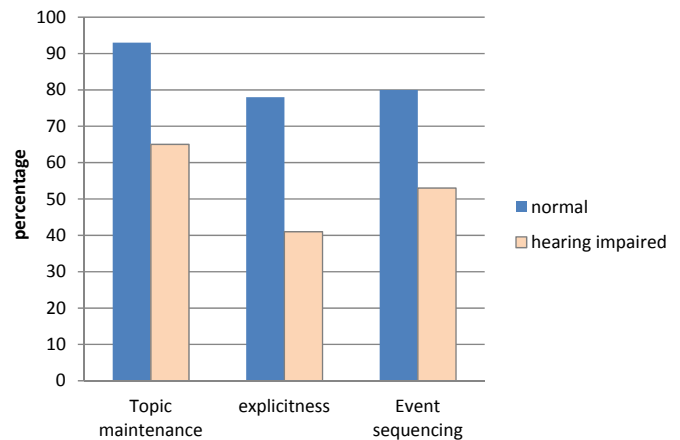


Fig. 1. Weighted percentages of topic maintenance, explicitness and event sequencing in normal hearing and hearing-impaired students.

Table 1
Comparisons of the macro and micro structures in the hearing and hearing-impaired children.

Statistical parameters subtests	Total score (Ranking)	Hearing (n = 15)		Hearing impaired (n = 15)		Mann-Whitney U statistics	p-value
		Sum of Ranks	Mean Rank	Sum of Ranks	Mean Rank		
Topic maintenance	4	292.50	19.50	172.50	11.50	52.5	<0.001
Event sequencing	4	333	22.20	132	8.80	12	<0.001
Explicitness	4	321.50	21.43	143.50	9.57	23	<0.001
Macro structure	12	335	22.33	130	8.67	10	<0.001
Conjunctive cohesion	4	344	22.93	121	8.07	1	<0.001
Referencing	4	345	23	123	8	0	<0.001
Syntax complexity	4	342	22.80	123	8.20	3	<0.001
MLU	4	345	23	120	8	0	<0.001
Micro structure	16	345	23	120	8	0	<0.001
Total score (ranking)	28	345	23	120	8	0	<0.001

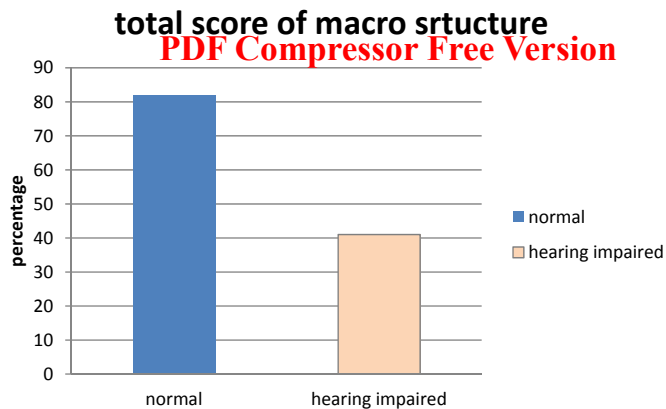


Fig. 2. Weighted percentages of total score of macro structures in normal hearing and hearing-impaired students.

more subject consistency than those expressed by the hearing group. A possible explanation for this result may be the lack of adequate topic maintenance in their narration of hearing impaired children. Another possible explanation for this is that hearing impaired children did not use cohesive markers (pronouns; conjunctions; conjunctive adverbs) correctly and adequately. Cohesive markers bind sentences together. Belavsky indicated that children by first grade showed below 15% inappropriate or ambiguous use of cohesion in stories [15].

Secondly, in the spoken language of the hearing-impaired children there was not enough information for a full understanding of the listener. This result is likely to be related to major difficulties in explicitness skills.

Thirdly, speech of the children with hearing loss was in less rational order than that of the hearing peers. It seems possible that this finding is partly due to a limited number of conjunctive adverbs (before, after, until, ...) or incorrect use of them. These findings suggest in that hearing impaired children have major difficulties in the micro-as well as the macro structures.

Regarding the macro structure sector of the test, the hearing children gained appropriate and excellent scores in the four subsets of this section, while none of the children with hearing loss performed well on appropriate referencing for individuals and events (they did not use or used rarely bound pronoun such as/am, at, ash/ in Persian and free pronoun/man, to, ?u/in Persian), semantic and pragmatic relations, and subordinating conjunctions (such as that, until, because, so that, since, when). Hence, none of their utterances were complex. This finding is in agreement with [7] who indicated that the storytelling task can assess the form, structure and use of language simultaneously.

This study showed that hearing impaired children cannot use language as effectively as their hearing peers, which is in agreement with the extensive research of Tye-Murray [15]. She believed that as hearing impaired and/or deaf children do not frequently practice language, they fail to use it in either an appropriate or an effective way in a range of conversational situations very well. Limited familiarity with many linguistic structures and limited vocabulary reduce their ability to get involved in conversation. Since these children cannot hear their parents or other people over distance, they do not receive daily common patterns of language use, which is considered another reason for their language pragmatic problems.

Another finding of this study is that the children with hearing loss utilize quite different pragmatic functions of language, which accords with the findings of Bliss et al. (1998).

According to the records of the participants, the efficient use of

residual hearing, the extent, quality and age of hearing rehabilitation, parents' involvement seem to be the factors that cause these differences and poorer scores in one group and better scores in another. Consistent with the aforementioned research [13], this variation in the application of pragmatics was approved by the findings of the present study as well. Hence, the families had probably referred to rehabilitation centers too late and the critical period for learning had already passed, so the clinicians did not have sufficient time to teach communication skills of pragmatics to the hearing impaired children. In other words, in terms of story retelling skills, the first grade primary school children with hearing loss are a heterogeneous group utilizing quite different pragmatic skills, due to variations in the degree of hearing loss, history of using hearing aid prostheses, the extent and quality of rehabilitation services, and families' involvement in their children's rehabilitation. Finally, a number of important limitations need to be considered with this study. With the small sample size and the heterogeneity of hearing impaired children, caution must be applied in interpreting the results. It seems it was better to have two separated hearing impaired groups, hearing impaired group wearing hearing aid and those with cochlear implanted. These are an important issue for future research.

5. Conclusion

Investigation of the story retelling criterion in the first grade primary school students demonstrated, on the one hand, a significant difference between the hearing and hearing-impaired children, pointing to the much poorer performance of the latter.

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