

# The comparative study between phonological awareness in normal and average hearing loss second elementary school student in Tehran

## Abstract

**Background and aim:** The important issues that are effective in learning to read in the last two decades and much research has been done is the phonological awareness. Phonological awareness guarantee much success in reading, so it is more powerful prognose as reading skills.

**Matrial and method:** This study is cross-sectional and analytic-descriptive study that focuses in first-grade students in the target population consisted of 30 students from 60 schools in Tehran natural and 30 students with average hearing loss, a cluster sample selection and their phonological awareness skills using a visual phonological awareness test which includes phonological awareness sub-skills, were examined. The obtained data were analyzed using the u- Mann-Whitney and t-test.

**Results:** The results showed that phonological awareness skills two groups are different (001/0>p), while the difference observed with probability (001/0>p) is of the determine the number of phonemes, syllables and determine rhyme words sub skills. Individual with hearing loss Compared to subjects with normal hearing abilities have poor awareness skills. The weakness in the sub- skills of determining the number of phonemes, syllables and determines how many words rhyme is more.

**Conclusion:** Considering the difficulties faced by children with hearing impairment in the course of learning to read and the double importance of reading in them, it seems to necessary to consider integrated educational system for students with hearing impairment.

**Keywords:** average hearing loss, phonological awareness skill, phonological awareness sub-skill

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## Introduction

The important issues that is effective in learning to read in the last two decades, much research has been done about it, is phonological awareness. Phonological awareness is integrated ability that shows itself along with the development of children during the preschool or school in multiple skills (skill of segmentation of expressive language skills into smaller components, sentence into words, words into syllables, word into the coda and rhyme, word into phonemes, sound manipulation skills including additions, deletions, and syllable and sounds substitutions and sounds and syllable composition skills).<sup>1,2</sup> In other words, in a comprehensive definition of phonological awareness, it is knowledge and understanding of the structure of phonetic and phonemic and syllabic in words, It means knowing a word are made of several syllables or what is the second sound? This knowledge and understanding resulted in skill that there is relationship between read Word and written words.<sup>3</sup> Phonemic awareness is necessary for access to alphabetic principles that is base on written language and during the reading development help to reader to detect the public structure with knowledge of the internal structure of words to and use them while reading.<sup>2</sup> Several studies have shown that phonological awareness guarantee much success in reading, so it is the most powerful prognose in reading skill.<sup>2,4-10</sup> Unfortunately, research in the area of the prerequisites for reading in children with hearing loss is very limited in Iran, and few can be as follows:

M. Shahriari assess the phonological awareness 160 hearing-impaired children (severe or profound) and normal developing in

second to fourth grade and points to the conclusion that hearing loss children have points in phonological awareness test on lower compared with normal children.<sup>11</sup> M. Rezaei In its study of 16 severe hearing loss fifth grade students reported similar results.<sup>12</sup> This weakness is seen even in foreign research results. Megan and Harris Beach in study on 5 years old hearing loss and normal children, found that hearing loss children have performance lower in images identification assignment with same sound and rhyme judgment than normal children.<sup>13</sup> In Harris and moron study on hearing loss children 14 and 8years old, it was found that children hearing loss and normal children have significant difference in assignment identification letters forming words.<sup>13</sup> In the Lasasu, Karin and Lybart conducted on severe and profound hearing loss children Found that, apart from communication style history, hearing loss children's capabilities in rime lower than normal children.<sup>13</sup> Stern and Guasomy in their study found that hearing loss children have syllabic awareness and the ability equivalent to those with normal hearing children.

And the equality was seen in judgment skills.<sup>11</sup> Iso stated that children with hearing impairment compared to subjects with normal hearing have lower ability in phonological awareness assignments.<sup>9</sup> Kranyn and Lybart<sup>14</sup> in their study showed that, although hearing loss students have ability to judge the rhythm of words and images, but the their ability to read is slower and more imprecise than normal counterparts.<sup>9</sup> A number of researchers including, in studies conducted on people with hearing loss results that, although people can judge about rhyming words or images, but usually hearing loss

people slower doing this assignments and normal children have more correct responses than hearing loss children.<sup>14</sup> In study's Rmand and danyl on hearing loss children 10 to 18years, it concluded that children with hearing loss have less susceptible to syllable structures compared with normal counterparts.<sup>8</sup> In study conducted on hearing loss children and assessed phonological awareness skills in terms of rhyme judgment tasks, concluded that children with hearing loss have lower performance compared to the control group.<sup>10</sup> In Russell' study conducted on 10 hearing loss children found that children, regardless of the method of communications, obtained phonological information and can judge rhyme with the help of this information.<sup>10</sup> Landberg conducted phonological awareness assignments on preschool hearing loss children (recognize rhymes and find the first phoneme). And the conclude that phonological awareness skills in hearing loss children is lower than normal children and children who have higher phonological awareness skills, better progress in reading.<sup>5</sup> Bruce Tambllyn and Linda Spencer In a study carried on 29 children congenital profound hearing loss children, cochlear implant had previous 4years, It concluded that, performance of hearing loss group in phonological awareness test that consisting of 3 rhyme recognition task, delition and composition was lower compared with their normal counterparts.<sup>15</sup> In this study, we aimed to test the performance of a visual phonological awareness<sup>11</sup> on two groups of children with normal hearing, average hearing loss, second grade school (i.e, where phonological analysis skill is completed)<sup>16</sup> to investigate this issue, the phonological awareness skills in second grade children with moderate hearing loss in what condition are compared with normal children. And to answer the question whether there is significant relationship between the access auditory access and phonological awareness skills?

## Matrial & method

This study was a analytic-descriptive cross-sectional study of non-intervention, which examined some phonological awareness skills in students of different levels of hearing. The study population consisted of all children enrolled in primary schools in Tehran second degree. inclusion criteria for hearing loss students is: the absence of a defect other than auditory impairment (a multi-handicapped), the absence of a history of not accepted in second degree, the absence of hearing loss in the family, success in the comprehension pre-test. The inclusion criteria for normal students are: the absence of not accepted in second degree, success in the comprehension pre-test, and the absence of articulatory disorders. Multi-stage cluster sampling method was used. 35 schools in 19 districts of Tehran selected that under covered by a combination system and samples are available hearing loss students and normal students randomly were selected. To collect research data were used from the following instruments:

- a) The hearing evaluation sheet pretest of lexicon perception related to phonological awareness test.this test includes all images that there are in phonological awareness visual assignments.
- b) Students selected to test of phonological awareness that are able to show 90% of all the images contained in test after calling them.
- c) Visual phonological awareness test: This visual test contains 6 sub-tests of the recognition of word that have similar first phoneme, the recognition of word that have similar end phoneme, the recognition of words that are similar in terms of the number of syllables, the recognition of rime, determination the number of phonemes and recognition of specific phoneme

in word. In this research is used tow subtest. Each of sub-tests includes 10 assignments. Each task includes 3 pictures that the child should answer based on what specified in sub-test and images. Each sub- test have maximum (10) points and the minimum (0) points.no-answer or wrong answer has (0) points and correct answer (1) points and total test have 60points. To compare the performance of the participants in phonological awareness assignments were used of Kolomograf- Smirnov test and u- Mann-Whitney tests independent t-test.

## Results

The mean and standard deviation and means comparison results are provided in Table 1–7. As the Table 4, Table 6 & Table 7 there was significant difference between performance of students with moderate hearing loss in assignments determination the number of phonemes and syllables and rhyme recognition with normal students( $p < 0.001$ ). And their performance on other sub-tests is equivalent, with this interpretation, as seen in Table 1, There was significant difference between the natural and hearing loss students In total visual phonological awareness test( $p < 0.001$ ). In both groups, the best performance for the similar final phoneme recognition sub-test and first phoneme recognition sub-test and worst performance is related to sub-test identification the number of phonemes and syllable.

**Table 1** The comparison of scores total phonological awareness skills in male students in two auditory levels in second grade school in Tehran

P value	S.D	Means	Number	Auditory level
	2.12	54.4	30	Normal hearing
$p < 0.001$	3.23	45.9	30	Average H.L

**Table 2** The comparison of scores similar first phoneme recognition sub-test in male students in two auditory levels in second grade school in Tehran

P value	S.D	Means	Number	Auditory level
	0.56	9.6	30	Normal hearing
$p > 0.001$	0.85	9.3	30	Average H.L

**Table 3** The comparison of scores similar final phoneme recognition sub-test in male students in two auditory level in second grade school in Tehran

P value	S.D	Means	Number	Auditory level
	0.62	9.6	30	Normal hearing
$p > 0.001$	1.12	9.1	30	Average H.L

**Table 4** The comparison of scores rhyme-words in male students in two auditory level in second grade school in Tehran

P value	S.D	Means	Number	Auditory level
	0.62	9.5	30	Normal hearing
$p < 0.001$	0.75	8.6	30	Average H.L

**Table 5** The comparison of scores specific phoneme recognition sub-test in male students in two auditory level in second grade school in Tehran

P value	S.D	Means	Number	Auditory level
	0.73	9.5	30	Normal hearing
$p > 0.001$	0.62	9.4	30	Average H.L

**Table 6** The comparison of scores syllable-number recognition sub-test in male students in two auditory level in second grade school in Tehran

P value	S.D	Means	Number	Auditory level
p<0.001	0.99	8.8	30	Normal hearing
	1.27	4.7	30	Average H.L

**Table 7** the comparison of scores syllable-number identification sub-test in male students in two auditory level in second grade school in Tehran

P value	S.D	Means	Number	Auditory level
p<0.001	0.93	7.2	30	Normal hearing
	1.18	2.6	30	Average H.L

Findings This research suggests auditory availability is factor affecting phonological awareness skill. In other words, the results of this study showed that there is a direct correlation between input acoustic signals and phonological awareness and people with different hearing levels acquire different levels of phonological awareness. The results of this study are consistent with the research. they discussed in their studies that predict which people with different hearing levels acquire different areas of phonological awareness.<sup>17,18</sup> The study also found two groups of participants in the initial phoneme assignment sub-skill have better performance compared with the number of syllables assignment sub-skill the number of syllables and rhyming words assignment. This finding contradicts the theory of phonological awareness development levels that discuss the child acknowledge larger firstly larger word structures like syllable and rhyme firstly and with aging to smaller structures, such as phoneme.<sup>1,17,18</sup> This could stem from a lack the education of skills in pre-school and primary school. While children to enter the school and Exposure of alphabetic principles used of orthography information rather than auditory information to shape phonological codes.<sup>19</sup> Due to limitations in auditory access in hearing loss children, impaired hearing, this dependency to visual/orthographic information more shown.<sup>3-7,21-23</sup> In other words, this leads to greater success the hearing loss students in tasks which visual information help to find aimed option. On the other hand, is likely to change in the education system, “whole-word reading” and eliminating segmentation of the second grade education and more emphases on visual information due to coding defect hearing-impaired children.

## Conclusion

Findings of this study indicate limited auditory access, influences the child’s ability to use the phonology of language. It seems that children with hearing impairment greater reliance on orthographic/ visual information compared to auditory information for phonological judgment, and if visual association provides enough information to lexical judgment, show the weaker. One of limitations this study was sparse and low sample size in hearing loss students. Given the problems that children with hearing loss encounter in later stages of learning to read,<sup>5</sup> it is necessary to be conducted more research in this area. Similar studies in pre-school age to prevent latter problems in children with hearing impairment in learning to read are essential. Since this study focuses only on the two phonological awareness sub-skills, it is recommended to be conducted comprehensive research on phonological awareness skills of children with hearing impairment.

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## Conflicts of interest

Author declares that there are no conflicts of interest.

## References

1. Anthony J, Francis D. Development of phonological awareness. *Current Directions in Psychological Science*. 2005;14(5):255.
2. Trehearne M, Healy L, Cantalini M, et al. *Comprehensive literacy resource for kindergarten teachers*. ETA/Cuisenaire; 2003.
3. Pearson P, Barr R, Kamil M. *Handbook of reading research*. Lawrence Erlbaum; 1984.
4. Harris M, Beech J. Implicit phonological awareness and early reading development in prelingually deaf children. *J Deaf Stud Deaf Educ*. 1998;3(3):205–216.
5. Musselman C. How do children who can’t hear learn to read an alphabetic script? A review of the literature on reading and deafness. *The Journal of Deaf Studies and Deaf Education*. 2000;5(1):9–31.
6. Luetke-Stahlman B, Nielsen D. The contribution of phonological awareness and receptive and expressive English to the reading ability of deaf students with varying degrees of exposure to accurate English. *J Deaf Stud Deaf Educ*. 2003;8(4):464–484.
7. Harris M, Moreno C. Speech reading and learning to read: A comparison of 8-year-old profoundly deaf children with good and poor reading ability. *The Journal of Deaf Studies and Deaf Education*. 2006;11(2):189–201.
8. Daigle D, Armand F. Phonological sensitivity in severely and profoundly deaf readers of French. *Reading and Writing*. 2008;21(7):699–717.
9. Kyle F, Harris M. Concurrent correlates and predictors of reading and spelling achievement in deaf and hearing school children. *J Deaf Stud Deaf Educ*. 2006;11(3):273–288.
10. Narr R. Phonological awareness and decoding in deaf/hard-of-hearing students who use Visual Phonics. *J Deaf Stud Deaf Educ*. 2008;13(3):405–416.
11. Shahriyari M. Evaluation childrens phonological awareness in normal and severe/profound hearing loss children first to fourth grade in tehran schools (Persian). *Thesis for Master of Science in speech therapy*. 2000:2–10.
12. Rezaee M. Evaluation Prereading skills in normal and severe hearing loss fifth grade elementary in Tehran (Persian). *Thesis for Master of Science in speech therapy*. Welfare and Rehabilitation University; 2009:12–22.
13. Harris M, Moreno C. Deaf children’s use of phonological coding: Evidence from reading, spelling, and working memory. *J Deaf Stud Deaf Educ*. 2009;9(3):253–268.
14. LaSasso C, Crain K, Leybaert J. Rhyme generation in deaf students: The effect of exposure to cued speech. *J Deaf Stud Deaf Educ*. 2003;8(3):250–270.
15. Connor C, Zwolan T. Examining multiple sources of influence on the reading comprehension skills of children who use cochlear implants. *J Speech Lang Hear Res*. 2004;47(3):509–526.
16. Castles A, Coltheart M. Is there a causal link from phonological awareness to success in learning to read? *Cognition*. 2004;91(1):77–111.
17. Spencer L, Oleson J. Early listening and speaking skills predict later reading proficiency in pediatric cochlear implant users. *Ear Hear*. 2008;29(2):270–280.
18. Vermeulen A, Van Bon W, Schreuder R, et al. Reading comprehension of deaf children with cochlear implants. *J Deaf Stud Deaf Educ*. 2007;12(3):283–302.
19. Chard D, Dickson S. Phonological awareness. *Intervention in School and Clinic*. 1999;34(5):261.

20. Stackhouse J, Wells B, Phil D. *Children's speech and literacy difficulties*. A psycholinguistic framework: Whurr London; 1997 .p.398.
21. Brown P, Brewer L. Cognitive processes of deaf and hearing skilled and less skilled readers. *The Journal of Deaf Studies and Deaf Education*. 1996;1(4):263–270.
22. Aparicio M, Demont E, Gounot D, et al. Is there an alternative cerebral network associated with enhanced phonological processing in deaf speech-users? Anexceptional case. *Scand J Psychol*. 2009;50(5):445–455.
23. Aparicio M, Gounot D, Demont E, et al. Phonological processing in relation to reading: an fMRI study in deaf readers. *Neuroimage*. 2007;35(3):1303–1316.