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# Treatment and speech-language development at the children with hearing impairments

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## Abstract

We analyze the speech-language development of deaf children and children without hearing impairments at the same chronological and mental age.

The sample was formed from 27 deaf children from 10-14 years who are involved in regular educational system and 27 children without hearing impairments. We implemented particularities we used the test of speech development (Smiljka Vasić).

The children whose treatment began before 18<sup>th</sup> months, realized approximately the same results in development of speech and language same as the persons of the same age without hearing impairments.

*Keywords:* hearing impaired; speech; language; treatment.

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## 1. Introduction

Deficiency or defect of any sense brings to physical human functions coordination disorder, retards the dynamic of orderly development or reorganize it in undesirable direction, it depends on which sense is damaged, impaired degree or etiology which provoked it. But, the most complexed consequence in personality development begins with eyesight disorder and specially sense of hearing. Sense of hearing, beside primary function which consists in receive and registration of sound, does many other associative functions important for speech development. Speech development begins with hearing, imitating and surround support (Kovačević, 2007.). If so for acoustic information has no way and speech stays on visual level, comes to intermission or interruption in his development. Limited or stopped speech development disturbs their regular adoption and development with which social communication persons limited with surrounding, but entangled developing higher intellectual capabilities which are in direct relation with speech and language development. Speech doesn't only represent a specific communication form but also tool of thinking, regulation method respectively organization of physic processes. By the speech- words and sentences in speech, analysis and generalization incoming information is realized, and on the base of got and managed informations formulate opinions and conclusions. The speech at the same time becomes method of

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communication and mechanism of intellectual work which creates the base for developing higher realization functions.

Specifications in speech-language development in the hard of hearing and deaf children were the subject of interest of numerous investigations. Following the speech-language development in children different hearing impaired degree in period till six months of life, Lenneberg, Rebbelski and Nicols (on Slavnić, 1996 :90), shows that almost there is no different in relation on normal hearing. By them, deaf babies also cry, vocalisates and have expansive voice like children with normal hearing. But, the period after sixth month of life performs the first critical moment when deafness begins to create the effects which stopped speech developing (Slavnić, 1996 :91). Because of that deaf child under the pressure of surrounding full of verbal communication begins to develop it's own forms which are on hierarchy scale of communication in lower level. Present noisily confusion and disturbed incomprehensible verbalization, conditions inconsequently reaction on speech which often make confusion and inhibitate deaf child in attempt to use his own speech (Slavnić, 1996 :91).

Missing acoustics component which stimulates adoption and speech development, deaf children learn the speech on special way which has influence on their vocabulary quality and quantity. When we analyzed vocabulary, a number of words which children use, we saw that it depend from the number of offered words which we gave them during rehabilitation and education. There is a big difference in the vocabulary volume of deaf child and the child with normal hearing the same age. Di Carlo (1964, by Slavnić, 1996.) shows that vocabulary of five years old deaf child consistes from 25 words if he did not include in intensive speech treatment, while Hodgson (1953.) found that clever deaf child between four and five years may adopt and learn 200 words in differences of child with normal hearing and who has percentage of 2000 words on the same age. Šlezinger and Midou (1972.) found on 40 deaf and 20 children with normal hearing sample preschool years old that 75% deaf children functioned in speech like 28 month child even lower, while children with normal hear had normal level of speech development for their age.

General, children with normal hearing during one year spontaneously learn about 1000 words, while deaf children have possibility to learn meaning and pronounciate only 300-350 new words by intensive rehabilitate-education treatment.

We go from general word fond as a base for a further construction in forming vocabulary on hard of hearing and deaf children. We gave special attention on frequency and representation kind of words in our language. Vasić (by Dimić, 2003.) shows three general word clusters for our language on which we must pay attention to vocabulary form in hard of hearing and deaf children:

- words which relates on person and which includes 22,78% of all words in active speech;
- words which relates on house and immediately surround which includes 26,54% all of words in active speech and
- words which connects for human survival and which includes 38,54% all of words in active speech.

Beside those three clusters there are 12,12% words which represent daily speech words.

The fact is that knowing and understanding, and also establishing good communication for language we must have a big lexical fund.

Adoption and acquirement of knowledge depends from knowing and understanding of language while accomplish school and others result depends from capability in verbal expression and vocabulary.

A practical frame according with this concipated theoretical work approach its is defined, a problem which related on establish relations between time of notification on surdological treatment and speech-language development in hard hearing impaired children who included in regular education system.

## **2. Methodology**

### *2.1. The aim of investigation*

The aim of investigation was to establish the influence of surdological habilitation-rehabilitation treatment duration on speech-language development in hearing impairment children who integrated in regular education system.

## 2.2. The sample of investigation

The sample consisted of 27 hearing impaired children over 85 dB and 10-14 years old who are educate in regular school and 27 normal hearing children of the same age who are also in regular school. In group of hearing impaired children were 37,03% or 10 children with beginning from 19 to 25 months, 14,81% or 4 children with beginning from 26 to 29 months and 22,22% or 6 children with beginning over 30 months. Related on sex were 40,74%, respectively 11 boys and 59,25% or 16 girls.

## 2.3. The instruments of investigation

For dates collection about speech-language development in hear impaired children we used the Test for investigation speech-language development by Smiljka Vasić, while data about surdological habilitate-rehabilitate treatment duration was took from a child record.

Test for investigation speech-language development consisted of five most frequent nouns: a mother, a house, a man, a sun, a life. Children had a task that on asked question give written answer.

With this test we got dates about the develop of children vocabulary, about signify contents level which was included by definition conception, and also about qualitative and quantitative definition nature. Quantitative analysis expresses through average number of words in answers on all five questions. Qualitative analysis expresses through definition nature which marked on following way:

Without answer or „I don't know“	- 0 point
Echolalia answer	- 1 point
Wrong answer	- 2 points
Functionally definition	- 3 points
Literary definition	- 4 points
Descriptive definition	- 5 points
Gives only general conception (logical definition I)	- 6 points
Gives specific characteristic attribute (logical definition II)	- 7 points
Completely logical definition, content general conception and characteristic attribute	- 8 points

## 3. Results of investigation with discussion

### 3.1. Qualitative representation results on test of speech development in children and duration of surdological habilitate- rehabilitate treatment

Table 1. Results on test of speech development in deaf children and normal hearing children

Type of answer	Deaf		Normal hearing		
	N	%	Type of answer	N	%
Without answer	18	13,33	Without answer	22	16,29
Echolalia	16	11,85	Echolalia	2	1,48
Wrong answer	15	11,11	Wrong answer	11	8,14
Functionally definition	12	8,88	Functionally definition	3	2,22
Literary definition	20	14,81	Literary definition	12	8,88
Descriptive definition	10	7,40	Descriptive definition	2	1,48
Logical definition I	22	16,29	Logical definition I	37	27,40
Logical definition II	8	5,92	Logical definition II	17	12,59
Completely definition	14	10,37	Completley definition	29	21,48

By definition analysis on asked questions, results (table 1.) shows that in deaf children the most represent answers were on the level of logical definition I (16,29%) which contents only general conception. Compared with the got results on the same test by children with normal hearing the got results shows that in answers children with normal hearing the most represent logical definition I (27,40%) which contents only general conception from describe phenomenon. But, in difference from children with normal hearing where represented answers after logical definition I were represented answers on level completely definition (with normal hearing 21,48%, deaf 10,37%), in deaf children after logical definition I were the most represent answers on level literary definition (deaf 14,81%, normal hearing 8,88%). Results confirm the connection between hear and speech development, and direct attention to limits and difficulties in speech and language development in conditions deficiency auditive stimuli.

Table 2 Results from speech development test and duration of surdological treatment

Type of answer	To 18 months	from 19 to 24 months	from 25 to 29 months	over 30 months
No answer	12%	14,29%	14,81%	14,29%
Eholalic	4%	/	14,81%	23,80%
Wrong answer	8%	8,57%	11,11%	33,33%
Functionaly definition	4%	/	14,81%	28,57%
Literary definition	10%	20%	29,63%	/
Descriptive definition	8%	11%	11,11%	/
Logical definition I	26%	22,85%	3,70%	/
Logical definition II	10%	8,57	/	/
Completly definition	18%	14,29	/	/

Connecting a time of notification on surdological habilitation-rehabilitation treatment of deaf children and realize results on speech-language development test, the got results shoves that the highest definition level realized children with the beginning surdological habilitation-rehabilitation treatment to 18 months. Completely logical definition realized: 18% children with beginning habilitation-rehabilitation treatment till 18 months and 14,29% children with beginning habilitation-rehabilitation treatment from 19 to 24 months, logical definition I: 26% children with beginning habilitation-rehabilitation treatment to 18 months and 22,85% children with beginning habilitation-rehabilitation treatment from 19 to 24 months. In children's answers with beginning habilitation-rehabilitation treatment from 25 to 30 months and over 30 months were the most present wrong answers (33,33%), as and answers on the level functionally definition (28,57%). The got results confirm assumption that the level of speech-language development direct conditional by start time habilitation-rehabilitation treatment on deaf children.

## Quantitative analysis of childrens results from the speech development test

Table 3 The results of speech development test in relation on total and average number of words

N	Total number of words	Average number of words
1	31	6.2
2	28	5.6
3	32	6.4
4	52	10.4
5	28	5.6
6	81	16.2
7	38	7.6
8	62	12.4
9	4	0.8
10	53	10.6
11	22	4.4
12	61	12.2
13	45	9.0
14	34	6.8
15	53	10.6
16	35	7.0
17	14	2.8
18	16	3.2
19	23	4.6
20	51	10.2
21	22	4.4
22	61	12.2
23	45	9.0
24	34	6.8
25	53	10.6
26	81	16.2
27	38	7.6

The best result in related on total word number had two children with 81 words and average 16.2 words, than follows children with words number from 62, 61, 53, 52 to 51, respectively average words from 12.4, 12.2, 10.6, 10, 4, to 10.2, which represent better results. On the middle level there are children with total words number from 45, 38, 35, 34, 32, 31, 28, 23 and 22 words, respectively average words number from 9.0, 7.6, 7.0, 6.8, 6.4, 6.2, 5.6, 4.6 to 4.4, while the worse results have children with total 16 and 14 words or average 3.2 and 2.8 words. The worse result has one child with total 4 words.

Table 4 Total and average words number and duration of surdological habilitation-rehabilitation treatment

Duration of treatment	Total words number	Average words number
from 25 to 29	31	6.2
from 25 to 29	28	5.6
from 19 to 24	32	6.4
to 18	52	10.4
from 30	28	5.6
to 18	81	16.2
from 19 to 24	38	7.6
from 19 to 24	62	12.4
from 30	4	0.8
to 18	53	10.6
from 30	22	4.4
to 18	61	12.2
to 18	45	9.0
from 19 to 24	34	6.8
from 19 to 24	53	10.6
from 25 to 29	35	7.0
from 30	14	2.8
from 30	16	3.2
from 25 to 29	23	4.6
to 18	51	10.2
from 30	22	4.4
to 18	61	12.2
to 18	45	9.0
from 19 to 24	34	6.8
to 18	53	10.6
to 18	81	16.2
from 19 to 24	38	7.6

In this group of speech-language development investigation, children with beginning surdological habilitation-rehabilitation treatment to 18 months and between 19 and 24 months have the largest number of total and average words. Number of total and average words of children with beginning surdological habilitation-rehabilitation treatment to 18 months and between 19 and 24 months were from 81 to 38 total words, respectively from 16,2 to 7,6 average words, while in children with beginning surdological habilitation-rehabilitation treatment from 25 to 29 months and over 30 months, total word number were from 34 to 14, respectively 6,8 to 2,8 for average word number. Only one child from sample with beginning surdological treatment after 30 months had small word number, total 4 words.

#### 4. Conclusion

Because of acoustic component deficiency from outer surround which stimulate speech learn, deaf children develop their special ways for adoption and speech develop. In children with normal hearing speech development precedes language development, while deaf children by adequate rehabilitation-educationally work overcomes speech, but stay on very low level of language development. Supposition is that is the consequence of such state contains in psychological structure in deaf persons to whom is the speech strange, but under the pressure of hear surround learn. Limit verbal experience have influence on vocabulary quantity and quality and in process acquisition and adoption of knowledge. Hearing impaired specially has influence on active vocabulary development.

By this investigation we confirmed positive connection between the time of begin habilitation-rehabilitation treatment and the speech-language development level in deaf children. Getting results shows that the highest speech-language development level reach children with whom habilitation-rehabilitation treatment begin in the earliest period when disturbance diagnosis done.

The results of investigation confirmed and generally positive influence of habilitation-rehabilitation work because good rehabilitation children realize almost approximate level of speech-language development as normal hearing of the same age.

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