TECHNIUM
SOCIAL SCIENCES JOURNAL

Vol. 8, 2020

# A new decade for social changes

ISSN 2668-7798

www.techniumscience.com

Technium Social Sciences Journal
Vol. 8, 52-59, June 2020
ISSN: 2668-7798
www.techniumscience.com

# Recognition and naming of the sentence content in deaf children trough verbal and neverbal approach

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**Abstract**. The aim of the research is to determine the effects on the recognition and naming of certain sentence structures through a verbal and non-verbal approach, or through the use of a verbal and non-verbal communication channel. The study was conducted on a sample of 30 deaf pupils at age from 11 to 14 years. As a measurement instrument, a modified image description test was used. The test consisted of six complexes, illustrated sentences, in which the actions and subjects performing certain actions are shown in the picture sequence in a way that deaf children understand. The descriptive analysis method was used for data processing. Measures of central tendencies and variations have been made. Testing the difference between verbal and non-verbal approach was performed by t-test. The correlation between the chronological age and the recognition and naming of the spoken structures were verified through the non-verbal approach. The results of the research have shown that respondents have achieved better results in recognizing and naming spoken content using the non-verbal communication channel, that there is a statistically significant difference in the use of verbal and non-verbal communication approaches in recognizing and naming spoken content, and that there is a high correlation between the chronological age of respondents and recognizing and naming of spoken content through a non-verbal approach

**Keywords**. naming, recognition, verbal approach, nonverbal approach, deaf pupils

## 1. Introduction

Communication is the indirect interaction between the individuals that is implemented by signs, or the interaction through the characters. Signs are instruments, means of communication, and only when the signs are used in interaction, it can be said that communication exist (Rot, 2004). Deaf people, because od loss of hearing are not able to spontaneously learn oral-voice language, but are forced to learn it systematically, through special methods and procedures, during their educational-rehabilitation process. In addition to the systematic learning of oral-voice speech and language, which is necessary for their communication interactions with listening people, deaf people continue to communicate within the population through sign language and thus marginalize the oral-voice language, making it difficult to achieve the final goal of education and rehabilitation (Hasanbegović, Salkić and Mahmutović, 2009). Sign Language is a form of communication and

understanding, not only within the population of hearing-impaired persons, but also between hearing impaired persons and listening people. In relation to the oral-voice, this mode of communication has its shortcomings, which are mostly manifested when it comes to grammar and syntax. In addition to the deficiencies, there are also positive aspects, which are manifested through its acceptability to the deaf and the enabling of adequate psycho-social development of the deaf persons (Bradarić-Jončić, 2000). Deaf people have a positive attitude towards all communication methods, and in their communication, they do not ignore the verbal communication method and use it in accordance with their capabilities, but they do not prefer it, regardless of the long-term education and rehabilitation (Salkić, Švraka and Povlakić Hadžiefendić, 2018). The deaf people prefer a sign language as a form of nonverbal communication because, in addition to many years of systematic education and re/habilitation in oral-voice speech and language, in most cases they have failed to master oral-voice language so that they can communicate adequately, so for this reason they avoid oral-voice communication and language communication (Salkić, Avdić, Švraka et al, 2015). There are five strategies for recognizing words in the text: phonetic analysis, analogy, structural analysis, context, and character recognition, while understanding of deaf readers includes two main categories. The first category is a prior knowledge of a reader that includes knowledge, knowledge of syntax, knowledge of the text structure and vocabulary, and the second category is a cognitive strategy that includes cognition and conclusion (Schirmer and Williams, 2003). Word recognition implies the correctness of the use of words in different forms, the linking of words with other words, the speed and the quality of its understanding (Lehr, Osborn and Hiebert, 2004). In the process of recognizing the word, the deaf people also use the spelling with fingers (Hirsh-Pasek, 1987). Deaf people use spelling with fingers when they want to closely explain the meaning of a concept in immediate communication (Hasanbegović, 2004). In the process of recognizing the word the deaf persons use linking of the initials, which implies the connection between the sign for a word, the spelling of that word and the written word (Padden and Ramsey, 1998).

In their communication, deaf people mostly use the non-verbal form of communication, or sign language and gesture speech, but in order to improve their communication they also use the verbal form of communication, that is, oral-voice speech and language. Since among deaf persons is predominant the non-verbal form of communication, and the verbal form of communication is used only in communication with listening people, this is why in this research the test situation was used through verbal and non-verbal approach.

**The aim** of the research is *to determine the effects on the recognition and naming of certain sentence structures through a verbal and non-verbal approach, or through the use of a verbal and non-verbal communication system*.

From the general set of research goals, the following research sub-goals have arisen:

- Examine the differences in the efficiency of recognizing and identifying particular speech structures through verbal and non-verbal approach.
- Determine the correlation between the recognition and naming of the spoken structures and the chronological age of the respondents.
- Determine whether there is a statistically significant difference in the recognition and naming of certain sentence structures through the use of verbal and nonverbal communication approaches.
- Identify the advantages of one or another approach in education and rehabilitation of deaf pupils.

Technium Social Sciences Journal
Vol. 8, 52-59, June 2020
ISSN: 2668-7798
www.techniumscience.com

## 2. Methods

### *2.1.Sample*

The study was performed on a sample of 30 deaf pupils whose hearing loss exceeds 80 dB, at chronological age from 11 to 14 years. According to the methodology of scientific research work, the sample falls into category of an expert or intentional sample.

### *2.2.Measurement instrument and method of conducting research*

As a measurement instrument, the modified test „Description of the image – actions“ was used for the collection of primary data (Kostić-Vladisavljević, 1984). The test consisted of six complex sentences, in which the actions and subjects performing certain actions are depicted in the picture. The test situation was modified through a custom test for this study, through a verbal and non-verbal approach. The sentences in the test are shown in the image sequence. The naming and naming of a series of images in a logical language sequence has been studied through a verbal and non-verbal linguistic approach. Determination of recognition level and naming was done in such a way that each recognition and naming was designated as „correct answer“. The total number of correct answers is six for each individual variable. As a secondary data source (hearing impairment data), audiograms of deaf pupils were used, on the basis of which only pupils with hearing impairment exceeding 80 dB were selected. The study was conducted at the Sarajevo Hearing and Speech Rehabilitation Center.

### *2.3.Data processing methods*

Within the descriptive statistics, the grouping of the obtained results was carried out. The results are shown in table and graphical form. Measures of central tendency and dispersion measures were calculated. Testing the difference between the arithmetic means between the verbal and the non-verbal approach was made by Student's t-test. The correlation between chronological age and the recognition and naming of the spoken structures through the non-verbal approach was made by Pearson's correlation coefficient.

## 3. Results and discussion

By observing Table 1 it can be stated that deaf pupils through non-verbal approach, from the possible 180 „correct“ answers, achieved 162 or 90% of correct answers. There was a small percentage of only 10% or 18 „false“ responses, or no recognition of spoken content through a non-verbal approach. Probably they are pupils, deaf children of hearing parents who are still in the process of learning both sign language and gesture speech, because they did not fully master it before entering school because of insufficient and inadequate communication with their hearing parents. It can also be stated that by verbal approach from the possible 180 „correct“ answers, they achieved 101 correct answers or 56.10%. This data suggests that most deaf pupils can verbally recognize speech content and develop a certain level of verbal communication with adequate and timely rehabilitation. However, a large percentage (43.90%) of pupils who do not recognize spoken content verbally, pointing to the conclusion that work should be done to improve educational and rehabilitation procedures. From all of the above we can conclude that deaf pupils showed better results in recognizing sentence content through non-verbal approaches.

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Table 1. Recognition of sentence content

| Recognition of sentence content | Recognize | | Does not recognize | |
|---|---|---|---|---|
| | N | % | N | % |
| Verbal approach | 101 | 56.1 | 79 | 43.9 |
| Nonverbal approach | 162 | 90 | 18 | 10 |

By observing Table 2 it can be stated that deaf pupils by non-verbal approach, out of the possible 180 responses had 141 or 78.30% of correct answers, while there was 39 or 21.70% false answers, on the basis of which it can be concluded, that most deaf pupils can name the pictorial representation of the sentence structure through the non-verbal approach.

By comparison of correct answers, in recognizing and naming through the non-verbal approach, we can conclude that deaf pupils are better at recognizing than naming the pictorial sentence structures.

Through the verbal approach, out of the possible 180 responses deaf pupils only reached 25 correct answers or 13.30%, while there was 156 or 86.70% incorrect answers, suggesting that most deaf respondents could not by verbal approach name the image shown and that in the process of education and rehabilitation we should work on the conceptual and substantive understanding of the sentence structures. It can also be stated that deaf pupils are better in recognizing than naming pictorial content in presented sentences through a verbal approach, as 56.1% recognized, and 13.3% named the content. Based on the above, we can conclude that deaf pupils showed better results in naming spoken content through non-verbal approach.

Table 2. Naming of sentence content

| Naming of sentence content | Name | | Does not name | |
|---|---|---|---|---|
| | N | % | N | % |
| Verbal approach | 24 | 13,3 | 156 | 86,7 |
| Nonverbal approach | 141 | 78,3 | 39 | 21,7 |

Based on the descriptive analysis, by comparing the obtained results of the recognition and naming of pictorial representations of the sentence contents through verbal and non-verbal approach, it can be concluded that deaf pupils are better in recognizing and in naming the pictured contents through nonverbal communication approach.

*3.2. Measurements of the central tendency of the correct answers for the variables of recognizing and naming the sentence content*

Table 3. Central tendency measures for the variable recognition of sentence content

| Recognition of sentence content | Mean | Median | Mode | Min. | Max. | Sum | SD | SEM |
|---|---|---|---|---|---|---|---|---|
| *Verbal approach* | 3.367 | 3.5 | 5 | 0 | 6 | 101 | 1.974 | 0.36 |
| *Nonverbal approach* | 5.4 | 6 | 6 | 3 | 6 | 162 | 0.932 | 0.17 |

Technium Social Sciences Journal
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Table 4. Central tendency measures for the variable naming of sentence content

| Naming of sentence content | Mean | Median | Mode | Min. | Max. | Sum | SD | SEM |
|---|---|---|---|---|---|---|---|---|
| *Verbal approach* | 0.8 | 0 | 0 | 0 | 4 | 24 | 1.324 | 0.241 |
| *Nonverbal approach* | 4.7 | 5 | 6 | 1 | 6 | 141 | 1.535 | 0.28 |

Based on the results from Table 5, we can conclude that the respondents statistically differ significantly in the recognition of the sentence content through the verbal and nonverbal approach (t = -5.584) at a statistical significance level of 0.05.

Table 5. T-test of differences in the recognition of sentence content through verbal and nonverbal approach

| Recognition of sentence content | Empirical value | Degrees of freedom | Critical value | Significance level |
|---|---|---|---|---|
| Nonverbal and verbal approaches | -5.854 | 29 | 2.045 | 0.05 |

Based on the results from Table 6 we can conclude that the respondents statistically differ significantly in the naming of the sentence content through the verbal and nonverbal approach (t = -12.354) at a statistical significance level of 0.05.

Table 6. T - test of differences in the naming of sentence content through verbal and nonverbal approach

| Naming of sentence content | Empirical value | Degrees of freedom | Critical value | Significance level |
|---|---|---|---|---|
| Nonverbal and verbal approaches | - 12.354 | 29 | 2.045 | 0.05 |

According to the studies by Hasanbegović (2008), there are statistically significant differences between verbal and nonverbal approach to interpretation on the variables of naming and recognition of terms in the sentence, at the level of statistical significance of p=0.00.

*3.2. Correlation analysis*

One of the aims of the study was to determine whether there is a correlation between the chronological age of the respondent and the recognition and naming of certain sentence structures in the nonverbal approach. The Pearson correlation coefficient was used to determine the level of correlation. Correlation analysis showed that there is a strong correlation between chronological age and the recognition of sentence content (r=0.756), as well as a high correlation between chronological age and naming of sentence content (r=0.873) at a risk level of 0.01. Given the strong correlation between chronological age, recognition and naming of sentence contents through the use of nonverbal form of

communication, we believe that speech and language learning and education and rehabilitation processes should prefer nonverbal communication, or sign language and gestural speech, as a natural form for communication of deaf people.

**In the literature available, we can find similar conclusions:**

Hasanbegovic (2008) investigated the same issue and used the same measurement instrument on a sample of 20 deaf pupils in the Education and Rehabilitation Center in Tuzla. The author has reached similar results. The results of the research showed that deaf pupils showed better results in recognizing concepts in the sentence through the non-verbal approach and that deaf pupils showed better results in naming sentence content through a non-verbal approach.

Wautersa et al. (2001) investigated whether sign language makes it easier to recognize words in deaf children. The children were tested before and after training, which implied a computer-based speech recognition exercise. The authors have come to the conclusion that word recognition is better when these words are demonstrated through speech and through the sign in relation to speech recognition only.

According to Siedlecki et al. (1990), one of the methods for recognizing words is the use of characters for each word. In the research, the authors used words that could be represented by a sign and a picture. They came to the conclusion that deaf people use the strategy of kinesic coding of the words.

Andrews, Winograd and DeVille (1994), on the basis of a comparative study of seven deaf pupils, in which they analyzed the understanding of the read text with and without prior summarizing of the text in the sign language, came to the conclusion that prior knowledge and its activation helped and had a direct impact on language learning and understanding in deaf pupils.

Studies by Schirmer (2003) suggests that, for understanding the reading, it is very important for deaf readers to develop knowledge about the structure of the story and that knowledge is adequately applied.

Garrison, Long and Dowaliby (1997), as a result of their research, indicate a direct link between the knowledge of the deaf people vocabulary and their reading with comprehension, and that reading with comprehension is influenced by the general knowledge of the deaf person.

Good readers generally have a great foreknowledge, and this very foreknowledge makes it easier to understand familiar topics and new texts because readers integrate meaning throughout the sentence to understand and develop the feeling by passing through it (Kelly, 2003b).

According to studies by Hasanbegović (2008) there is a correlation between the recognition and naming of terms in verbal and nonverbal examination, but the correlation is not strong, which can be explained by the fact that the deaf persons are not much interested and do not show a high level of responsibility for the language of the hearing which they learn through their education.

## 4. Conclusion

- Recognition and naming sentence content in deaf pupils is different when using verbal and non-verbal communication systems. Deaf children achieve better results in recognizing and naming sentence content using non-verbal communication systems.
- The poorer results of deaf pupils with verbal communication system are the direct result of insufficiently developed oral-voice speech and language. Given that deaf people do

not have a phonological experience of words, the recognition and naming of sentence content is better interpleted in nonverbal form, which in some way assesses the linguistic compatibility of deaf people.

- By analyzing the differences in arithmetic means, the respondents statistically differ significantly in the recognition and in the naming of sentence contents through the use of verbal and nonverbal communication systems.
- Correlation analysis showed that there is a strong correlation between the chronological age of the respondent and the recognition of the sentence content (r=0.756), and the chronological age and the naming of the sentence content (r=0.873) through the non-verbal communication system.
- Due to the strong correlation between chronological age, the recognition and the naming of word content through the use of non-verbal forms of communication, in the oral and voice learning, and in educational and rehabilitation processes for deaf children, the nonverbal communication should be preferred, or sign language and gestural speech, as a natural form communication of deaf people.

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