



The development of lexicon in children with hearing impairment in the context of interpreting pictures in comic-strip form

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Introduction. Pictures in the comic-strip form are often used in practice as a means of examining the development of speech and language of children with hearing impairment. *Objectives.* The aim of the research was to establish the development of the lexicon and the level of content comprehension of pictures in the comic-strip format in written expression of students with hearing impairment 11–15 years of age (and to establish whether the age affected students' success and compare their results with their typical peers). *Methods.* A story in the comic-strip form, designed for the needs of this study, was used in the research. It comprised four pictures interconnected through the sequence of events. Each picture was allocated a number of expected answers. *Results.* The obtained results point to the difficulties in understanding the content of pictures in the comic-strip format in written expression of children with hearing impairment and their underdevelopment compared to their typical peers. It was observed that age had a partial effect on the development of vocabulary (no statistically significant differences) ($t = -0.87$, $df = 122.9$, $p = .39$). However, the trend of achievement with age was observed. *Conclusion.* We found that children with hearing impairment failed to understand the story, observe important elements, and comprehend the essence. The abstract side of the pictures in the series, which gives sense, was neglected, and thus, the conclusion was not made, nor was the message grasped.

Keywords: series of pictures, vocabulary, expected answers, students with hearing impairment, typical peers

Introduction

Language is the most common system of communication, which is the agreed organised system of elements and signs that becomes speech through practical implementation, which is a language in use. A child learns speech and

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language as a result of the need to communicate with others and for functional communication in everyday situations. The language is realised in oral and written form, i.e. through speech and writing (Pavičević-Franić, 2005).

On the one hand, language involves speaking (expression), and on the other, understanding (reception). Linguistic expression (expressive linguistic skills) includes content (semantics), form (phonology, morphology and syntax), and the correct use of language in a certain context (pragmatics), while linguistic understanding (receptive linguistic skills) means understanding spoken and written language (Dulčić & Pavičić-Dokoza, 2013).

The process of learning a language is directed to the development of general communication abilities and the development of vocabulary, the development of literacy skills, a student's expression, learning of sentence structure and linguistic acts of active listening, speaking, reading, and writing in the mother tongue.

Sarif (2019) underlines that linguistic skills are very important for the improvement of the overall knowledge which is passed on to children. Language is part of the cognitive potential of each individual, and Hudzaifah et al. (2021) emphasize that cognitive abilities are comprised of various mental processes linked to comprehension, attention and contemplation.

The work on the development of linguistic skills is a form of learning, and it aims to enable listening and expression through speech, extend the vocabulary and bring about the recognition of symbols which represent the speaker (Parida, 2019).

Oral and written expression are extremely complex and demand skills which involve a certain level of development of cognitive and linguistic abilities. The ability of oral expression and oral structuring of a story, i.e. creation of the beginning, the middle, and the end of a story, requires a certain level of the development of cognitive functions, while the application of language and linguistic shaping of a story require linguistic development (Kuvač, 2005, as cited in Velički, 2013).

Apart from the development of cognitive functions, written expression means mastering different skills, such as: learning and forming the graphemic system (writing letters in accordance with the type of script in which the communication is established), learning orthographic and grammatical norms of a standard language at morphological, syntactic, and lexical level, learning stylistic norms and knowledge of text structure, the ability to observe and evaluate a text, and the ability to observe mistakes in a text (Rosandić, 2001).

Language in children with hearing impairment

Language is the system which consists of phonic signs, and its main features involve organised composition, inventiveness, and cultural effect (Siregar et al., 2018).

In children with hearing impairment, sign language develops parallel to the development of oral and written speech. Although American Sign Language (ASL) is the language of the population of the deaf, let us remind ourselves that the vast majority of deaf children (~95%) were born in families that can hear. For the majority of deaf children, ASL is the language they are never exposed to at an early age. Instead, many families that can hear are faced with complex decisions about the system of communication with their child, such as insisting on the spoken language, lip-reading, or the system of signs based on the English language (Anderson, 2006).

Learning the written or spoken language opens the possibilities for deaf children to acquire new knowledge. Access to the natural sign language facilitates this process. Although the research proves the benefits of natural sign languages, many experts still suggest insisting on the spoken manner of expression (Hall et al., 2019). However, the results of children with hearing impairment on language tests are still poor despite early detection, early rehabilitation, and provision of support (Erbasi et al., 2017).

Wasita (2012, as cited in Hudzaifah et al., 2021) believes that many children with hearing impairment have barriers to understanding and composing sentences in the Indonesian language. The outcomes of teaching children with hearing impairment are also low. They have narrow vocabulary, difficulties in understanding abstract and impaired speech. Indriyani (2019) states that due to that, there is a lack of motivation to teach children with hearing impairment and to learn the Indonesian language. The author partially explains that as a result of the lack of contemporary teaching media provided by a teacher in a classroom. Wati et al. (2020) point out that the teaching media represents every person, material, tool, or event, which can create effective conditions that enable students to acquire knowledge and skills and form opinions.

The skills of oral expression and literacy are also developed through telling and writing stories on the basis of pictures (a story in a series of pictures, a story in the comic-strip format, etc.). Telling and writing stories on the basis of pictures enable the development of expression, vocabulary, imagination, logic, linking, and understanding. Wright (1990) points out that the pictures find their usage in learning vocabulary, spelling newly acquired words, and teaching reading and writing. As'ad (2019) says that describing pictures was efficient for the development of the logical speaking ability of students.

On the one hand, a story in a picture or pictures offers the possibility for independent expression, imagination and creativity, while on the other hand, it gives children the opportunity to create dialogues and enrich the story as they wish by examining it thoroughly. Picture stories provide the possibility for excellent insight into the structure of the story, and they enable children to observe the entire story with all its important parts by looking at it. They stimulate visualization in children, making it possible for children to observe

the existence of a pictorial representation for each event. Older children may find inspiration in picture stories, which may stimulate their imagination and be a convenient means for examining the speaking and linguistic skills of students of all ages. Gallion (2016) underlines that the most effective way when teaching vocabulary to students with hearing impairment is to start with visual representation. Nonetheless, authors differ in their opinions. For many reasons, deaf children and adults achieve poor results when learning through the material presented in pictures (Conway et al., 2009; Lévesque et al., 2014).

The entire linguistic and intellectual development (the development of speech and thinking) is delayed in children with hearing impairment. Underdeveloped linguistic skills prevent them from seeing abstract relations, which is only possible through verbal expression. The delay in elementary developmental expression, i.e. a notion, affects vocabulary enrichment, the turning of the passive deposit of words into the active verbal vocabulary, the development of logical thinking and overall expressive speech, thus also affecting comprehension and acquisition of knowledge (Isaković et al., 2010).

Considering the difficulties in the development of language, deaf and hard of hearing children structure stories following the series of pictures with great difficulty. Most frequently, they follow the sequence well, and they understand causal relations, but they encounter difficulties in morphological and syntactic shaping (Kelić, 2013). Depending on the maturity and the capability of oral expression, deaf and hard of hearing students will list persons and actions that are taking part in the picture, or they will form a story (Kovačević, 2005).

Herega (2014) states that the majority of persons whose hearing was impaired before they learnt speech and language (prelingual deafness) have huge difficulties in understanding a written text and in oral expression. Considering the fact that the language is learnt through listening, deaf persons learn the written language with difficulty, especially if their surroundings (the family and the school) do not direct them to everyday learning of new terms and reading. Written expression of people with hearing impairment is often agrammatical, scarce, of incorrect syntax, and hard to understand. The comprehension of a written text is poor in the majority, which is the result of deafness and not of intellectual deficit. This data points to the necessity of using simple words and sentences.

Many authors have analysed the achievements of deaf and hard of hearing children when describing pictures and observed the following characteristics. Analysing the results on the occasions of picture story description, Vujasinović and Isaković (2007) have observed that students name the notions they notice in the pictures. Few students connect pictures into a story using sign language when describing a picture story.

In her research, Isaković (2007) concluded that in written expression, deaf and hard of hearing children mostly used the present tense, rarely the past tense,

while they almost never used the future tense. Kovačević et al. (2010) concluded that when describing pictures, deaf and hard of hearing children mostly used so-called notional words – nouns and verbs, and they used adjectives and adverbs much less. As for functional words, the children mostly used exclamations. They used prepositions and conjunctions significantly less, while they never used pronouns, numbers and particles.

Kovačević and Isaković (2016) conclude that written and oral expression of deaf and hard of hearing students in describing pictures is linguistically poor. Students communicate their thoughts, feelings, and reflections with difficulty. Dimić et al. (2011) examined the function of a comic-strip story in language teaching. They concluded that simple sentences are used the most, while simple sentences with a complement are used at an older age. The authors assert that it is necessary to work more intensely on the development of vocabulary, learning new words that will have greater functional value, which will certainly improve the use of words in oral and written expression. In their research, Kovačević and Isaković (2014) analysed the ability to describe pictures. They found that deaf and hard of hearing students do not use all parts of speech with equal success. The leading categories of words used in describing pictures (in sign and spoken expression) are nouns and verbs, which points to the significance of visual perception in the development of the language of deaf and hard of hearing children. The students used certain words only in sign language expression. The majority of words yielded within sign and spoken language expression were obtained as a result of listing words (persons and actions) without connecting them with the entire action the pictures showed.

In order for the results and the achievements of deaf and hard of hearing students to be better, the fostering and development of oral speech should be one of the priority tasks in education. Working on oral speech development with students, the teacher widens the vocabulary and phraseology, and teaches them to express their thoughts logically and consequentially, which is essential for the development of written expression (Dimić, 2002).

A deaf child experiences difficulties in everyday social functioning (Haenudin, 2013). Deaf children are educated in schools intended for deaf and hard of hearing children and in regular schools with children who can hear. The manner in which deaf children receive information and acquire knowledge is rather specific. The lack of auditive information impedes acquiring and processing what is said, which causes poor communication (Hudzaifah et al., 2021). Children with hearing impairment gain knowledge through the material they are presented with at schools by teachers, depending on their capabilities.

The way in which deaf students process syntactic and semantic signs while reading and writing a sentence is unclear. While certain studies supported the preference for semantic signs, other failed to do so (Gómez-Merino et al., 2021).

Objectives

The aim of the research was to establish the development of vocabulary and the level of content comprehension of pictures in the comic-strip format in written expression in students with hearing impairment 11–15 years of age. The obtained results were compared to the achievements of their typical peers. The effect of age on the achievements of children with hearing impairment was also examined.

Methods

Sample

The research sample included 127 students, of whom 64 (50.4%) had a hearing impairment, and 63 (49.6%) were typical peers. Students with hearing impairment in the sample were 11–15 years of age and attended schools for children with hearing impairment in Sarajevo, Tuzla, Banja Luka, Belgrade and Zemun, where the research was conducted. There were 19 students (29.7%) aged 10–12, 21 students (32.8%) aged 13–14, and 24 students (37.5%) who were 15 years old. The sample comprised 32 girls (50%) and 32 boys (50%). The sample included students without additional difficulties (lower cognitive functioning), neurological problems, and other forms of disabilities.

In the group of typical peers ($n = 63$), 26 students (41.3%) were 10–12 years old, 24 students (38.1%) were 13–14, and 13 students were 15 years old (20.6%). This group comprised 34 girls (54%) and 29 boys (46%). Analysing the sample by gender, we can observe that the groups are equal ($\chi^2 = 0.20$, $df = 1$, $p = .65$).

The group of typical peers was selected on the basis of the chronological age of students attending a school in Sarajevo.

Instrument and procedure

A specially constructed story in the comic-strip format was used in this research to examine a certain aspect of linguistic development of the participants stimulated by the effect of visual perception. The internal consistency coefficient (Cronbach's alpha) obtained in this sample was .62.

The story is composed of four pictures which are simple and appealing to children. The pictures are set in regular order and interconnected by the sequence of events, and are set before the students in such an order. Looking at them, the students were tasked with writing a story based on the given pictures. The maximum number of expected answers was 14. The number of expected answers was analysed. The answers which did not entirely match the expected answers (in terms of grammar or orthography) were also accepted. The accepted answer could be both a word and a sentence which match the offered expected answers.

The expected answers include the following:

Picture	Expected answer
I	It is raining. Children are going home. School. Rain pool
II	A boy and a girl saw a dog. Sad dog (The dog is sad.). Wet dog (The dog is wet.)
III	The children took a dog (and took it home.). They gave it food and water. They are playing. Happy children (The children are happy.) Happy dog (The dog is happy.)
IV	The dog got a house. (The dog has a house.). The children helped the dog.

Data analysis

The statistical package for data analysis IBM SPSS Statistics 23.0 was used for data processing. Descriptive statistics (M and SD), as well as the statistical significance of differences in average values (t-test for paired samples, for checking significance of difference at the level of the entire sample, and ANOVA test for checking statistical significance of differences among students) were applied. The Chi-square test was used as well.

Results

Table 1

The results of students with hearing impairment on the story in the comic-strip format

	Minimum	Maximum	M	SD
I picture	0	4	1.89	0.76
II picture	0	3	1.84	0.70
III picture	0	2	1.49	0.74
IV picture	0	5	1.70	1.07
Total	0	14	6.92	2.48

As shown in Table 1, the students had the highest number of expected answers when describing the first picture ($M = 1.89$, $SD = 0.76$), and the lowest when describing the third picture ($M = 1.49$, $SD = 0.74$), and this difference was statistically significant ($t = 3.77$, $df = 6$, $p < .001$). The lowest number of given answers was 0, and the highest was 14. Producing all expected answers points to the comprehension of the story presented in the comic-strip format and to the students' ability to make up and write a story. While the results of the students with hearing impairment in writing a story were followed, it often happened that the answers were not written in the form offered but were accepted as such as they reflected the comprehension of a certain segment of the story. Such results may be interpreted by the fact that the students did not perceive the presented situations and emotions in the best possible way, i.e. they had difficulties in their linguistic shaping for the use of abstraction that represents a problem.

Table 2

The comparison of results of students with hearing impairment and typical peers in all four pictures

Picture	Students with hearing impairment		Typical peers		<i>t</i>	<i>df</i>	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
I picture	1.89	0.76	1.77	1.08	0.69	109.8	.49
II picture	1.84	0.70	1.58	0.78	1.96	121.1	.052
III picture	1.49	0.74	1.71	0.49	-1.94	108.2	.055
IV picture	1.70	1.07	2.24	1.34	-2.50	116.6	.014
Total	6.92	2.48	7.31	2.49	-0.87	122.9	.39

We also compared the results of students with hearing impairment and typical peers in all four pictures, and we observed approximately similar results (Table 2). On average, the students with hearing impairment achieved the highest results in the first picture and the lowest in the third picture, while the typical peers achieved the highest results in the fourth picture and the lowest in the second picture.

By using the independent samples t-test, a statistically significant difference was observed between the results of the students with hearing impairment and the typical peers in the fourth picture ($t = -2.50$, $df = 116.6$, $p = .014$), which points to a better understanding of the story considering the fact that those last pictures presented the resolution of the events. The fourth picture represents the denouement of events, it carries a message, and thus the children who can hear showed a more efficient way of linguistic shaping of pictures in a series. Marginal significance obtained in the second and the third pictures point to the tendency for better linguistic expression and comprehension of content, which was eventually shown in the fourth picture.

Students with hearing impairment had lower results ($M = 6.92$, $SD = 2.48$) than the typical peers ($M = 7.31$, $SD = 2.49$). Comparing the results of these two groups, we can observe that the students with hearing impairment, on average, achieved a lower level of results, while it should be noted that no statistically significant difference was observed ($t = -0.87$, $df = 122.9$, $p = .39$).

Most students used the following sentences: "It is raining" (95.2%), "A boy and a girl saw a dog" (84.1%) and "The children took the dog" (79.4%), while the fewest students used the following sentences: "Happy children" (6.3%) and "The children helped the dog" (6.3%).

Table 3*The results of students with hearing impairment – by pictures*

Picture	Expected answers	Percentage correct
I	I It is raining.	95.2
	II Children are going home.	71.4
	III School	15.9
	IV Rain pool	6.3
	V A boy and a girl saw a dog.	84.1
II	VI Sad dog (The dog is sad.)	77.8
	VII Wet dog (The dog is wet.)	22.2
III	VIII The children took the dog (and took it home.)	79.4
	IX They gave it food and water.	69.8
	X They are playing.	58.7
IV	XI Happy children (The children are happy.)	42.9
	XII Happy dog (The dog is happy.)	39.7
	XIII The dog got a house. (The dog has a house.)	22.2
	XIV The children helped the dog.	6.3

The obtained results show a significant drop in the number of used expected answers in the third and fourth pictures, which indicates that the majority of students did not understand the point of the story, i.e., the story in its entirety, as the third and the fourth pictures present the resolution of the events. The percentage of used sentences points to the fact that the students observed only the concrete content shown in the picture, while they failed to observe emotions and more abstract aspects. Thus, they produced sentences which indicate that the emotions of the characters in the story and the complete background of the entire story were observed more rarely.

In the majority of cases, when writing the story, the students only listed nouns and occasionally a verb. The words were often misspelt and used inadequately (inadequate use of gender, number, person and case), for example: “škola” (instead of “škola” for school), “kuća” (instead of “kuća” for house), “devojica” (instead of “devoјčica” for girl), “vezela” (instead of vesela” for happy), “djesa” (instead of “djeca” for children), “vitjela” (instead of “vidjela” for past tense of the verb to see), etc.

In certain cases, they wrote incomplete and incorrect “sentences”, such as the sentences given in the footnote.¹

1 [Translator’s note] The approximate translation of the sentences given respectively: “At school over. Children are go home. Boy is a smile. Smiling is. At school when finish go home. Children home. Children go home rain falling. It was rain falling. Children sees dog wet. Dog water wet. Dog is sad. Children are taken and I go home. The wiped it dog wet. Gave food and water dog eats. They are happiness. Now they sad. Dog in yard happy. Children to make house for dog. Children a lot help dog. Boy and girl are help dog.”

Based on all of the aforementioned, we can notice that the children with hearing impairment did not recognise or distinguish important elements of the plot (retelling) from less important ones, and they failed to sufficiently perceive the entire story and understand its essence. The affective and the abstract side of the story, which lends sense to the entire story, was disregarded, and thus the students could not draw a conclusion nor understand the moral of the story.

Table 4

The results of children with hearing impairment on the comic-strip story in relation to their age

Age	<i>M</i>	<i>SD</i>	<i>N</i>	<i>F</i>	<i>df</i>	<i>p</i>
10–12 years old	6.58	2.44	19			
13–14 years old	7.15	2.84	20	0.34	2.61	.71
15 years old	7.32	2.55	24			

The students aged 10–12 achieved the lowest results ($M = 6.58$, $SD = 2.44$), followed by the results of the students aged 13–14 ($M = 7.15$, $SD = 2.84$), while the oldest students achieved the best results ($M = 7.32$, $SD = 2.55$). We notice that the students' results show a continuous tendency to rise but without a statistically significant difference. This can be explained by individual differences among students within the groups, which are often observed, as well as by a certain form of mild stagnation in linguistic development, which is observed at that age. Vasić (1981) points to the occurrence of a certain kind of crisis in linguistic development during prepuberty and puberty, which does not mean linguistic underdevelopment, but it can signify the tendency towards the development of individual linguistic expression.

Discussion

The results of our research indicate poorer results of the students with hearing impairment on average, while in certain aspects of language development, they also point to the reduced ability to write content based on the offered pictures compared to the typical peers. On the one hand, this is the result of receiving auditory information with more difficulty and insufficiently acquired mother tongue, and on the other hand, it is the consequence of linguistic processing being harder.

Judging by the results of students with hearing impairment in relation to their age, the highest results were achieved by the oldest students, and the poorest results were achieved by the youngest students (no statistically significant differences were observed among the students of different ages, but progress in line with age was observed). We can say that such results show the significance of school and continuous work with children. We can see that the linguistic abilities and the ability to write based on the given pictures

increase with age. However the results are still rather moderate and they point to insufficient language development.

Our research results agree with the research of Kovačević and Isaković (2010), who observed that written and oral expression of deaf and hard of hearing students in describing pictures was difficult to analyse, agrammatical, and linguistically poor. Oral expression was a special problem. Thoughts were given form and conveyed to a written medium with a particular difficulty. Inadequate use of personal pronouns and agrammatical structures was confirmed. In her research, Isaković (2013) determined that the number of used words decreased with age, while the number of used sentences increased. When describing pictures, the oldest students used only sentences, which also confirms the results of our research, which shows better results of older students. Isaković (2007) also found frequent addition of prepositions and auxiliary verbs, omission of words (conjunctions, particles and auxiliary verbs) and the use of meaningless lexemes. With some of the participants, the level of sentences was not reached, but the picture description consisted of listing persons and objects observed in the picture. In their research, a group of authors (Pantelić et al., 2007) concluded that when interpreting pictorial material, children with hearing impairment used a higher number of words than children with normal hearing. Around 30% of sentences were agrammatical, and sentences had 5.3 words on average.

When describing pictures, students do not grasp the moral of the given story, regardless of the interpretation method they use – verbal or in signs (Vujasinović & Isaković, 2007).

Our research, as well as many others, corroborates the fact that the essential problem of deaf persons is not deafness as such and not even communication, but literacy, comprehension of pictures, and writing skills, i.e. linguistic competences (Pribanić, 2007).

Similar results were obtained by other authors, who also confirm our conclusion and assert that written and oral expression is characterised by agrammatism, omission of punctuation, and dominant use of nouns (Dimić & Isaković, 2008). A group of authors also claim that deaf children produce poorer results, especially in grammar development (Lederberg et al., 2012).

Waltzman et al. (2003) point out that children with hearing impairment have severe deficiencies and underdevelopment in receptive and expressive areas of the oral English language, including vocabulary, grammar, notions and pragmatics. Moreover, they assert that poorer achievement at school arises as a result of linguistic shortcomings, which is particularly noticeable in reading and writing. The authors underline that numerous scientists noticed that the linguistic abilities of children with hearing impairment are twice as less developed than in children who can hear.

Based on the research conducted in Indonesia, the authors conclude that children with hearing impairment experience difficulties in their ability

to compose sentences. Mistakes are observed in wrong word order in a sentence containing a subject (S), a predicate (P) and an object (O), which the children omitted (Ruspitayanti et al., 2015, as cited in Hudzaifah et al., 2021). We obtained the same results analysing the sentences in our research, where the listing of words, most usually nouns, which did not have the function of sentences occurred.

Certain teachers point out that the communication of children through nonstandard sign language, which disregards correct orthography and grammatical rules of written language, leads to such an issue. Furthermore, it results in slow answers to longer and more complex questions, which the children do not use in their written expression (Hudzaifah et al., 2021).

The essential problem deaf children encounter is the exchange of information. This brings about misunderstandings in everyday life situations (Wikasanti Sitepu, 2014, as cited in Hudzaifah et al., 2021). Correctly structured sentences and their adequate use are imperative for mutual understanding of all the participants in a conversation.

The results of our research agree with the research of a group of authors who find that children with hearing impairment in primary school have obstacles and low ability to compose a sentence as a result of poor motivation, lack of innovation and creativity in education, media which should be used more – pictures, graphs, presentations, applications (Hudzaifah et al., 2021).

In this research, we observed that the written sentences are usually short, very simple, most frequently consisting only of a subject and a verb, with a rather limited stock of used words, which in most cases reflects only a concrete action shown in the pictures. All of this points to the fact that writing is not only a writing technique but also a way of thinking and expressing oneself. For somebody to write, they must have developed linguistic experience as the skill of writing is always linked to the level of linguistic abilities. For those reasons, the problems children with hearing impairment experience in listening, speaking and writing are reflected and often increased in writing on their own.

The most frequently observed mistakes were as follows: mixing capital and small letters, writing sentences with the small first letter, omission of punctuation (the full stop at the end of the sentence, a coma in a sentence), frequent agrammatism (gender, person, case, tenses, word order in a sentence, etc.), substitution of sounds, omission of functional words in a sentence, lack of verbs and auxiliary verbs in a sentence, mere stringing of words in a sentence (usually only nouns), writing several sentences in a series, without a full stop, a coma, a capital letter, mixing Latin and Cyrillic script, writing a capital letter in the middle of a sentence where unneeded, mixing tenses in a sentence (“Immediately took and brings to house“), writing sentences in the first person. Isaković (2007) obtained similar results in her research, where she observed problems in understanding, constructing, and using a sentence. The sentences

were short, with a small number of words arranged one after another in an unconnected sequence.

A very interesting result obtained in our research is that the students with hearing impairment demonstrated the highest results in writing the content of the first and the second pictures, with a noticeable decline in their results in writing the content of the third and the fourth pictures, in which the resolution of events was shown and where more abstract content was presented. The students with hearing impairment achieved higher results than their typical peers in the first and the second pictures, which showed a concrete action.

The limitation of the research

We consider the lack of national and foreign research on this topic to be an aggravating factor in comparing and interpreting the results of this research. Namely, the analysis of the form and the content of what is written on the basis of pictures, the understanding of the meaning of pictorial material and its verbalization are not the frequent research topic. Considering the fact that children with hearing impairment are compelled to turn to visual perception and that it is vital in forming different types of terms, the extension of vocabulary and written linguistic expression, we considered this issue to be significant.

The abundance of pictorial material is used in working with the deaf, which helps in the development of oral and written expression. However, as a result of the lack of more recent research on this topic, we referred to some older research carried out in our language speaking countries. The linguistic expression changes, but these changes are not dramatic and they do not occur quickly. Moreover, the sample of our research comprises students with hearing impairment who attend special schools in Bosnia and Herzegovina and the Republic of Serbia, and it is not wide. The reason for that is that it did not comprise children with associated disabilities, whose number in these schools is growing.

Recommendations

It was important to conduct several similar research studies, which can give us more information on the development of language, lexis, semantics, syntax, and pragmatics of children with hearing impairment. Cognitive abilities, perception, inferring, and the development of abstract thinking would be the current topics which would find their implementation in practice. It would be interesting and essential to conduct similar research studies which could explore the linguistic development of students with cochlear implants, considering the fact that we have an increasing number of these students nowadays. Such information could be of great significance for the study of language development with a view to devising fresh methods and processes in work focusing on the linguistic progress of students with hearing impairment

and students with cochlear implants, which would be more functional and better used in their education.

Conclusion

Writing content based on a series of pictures is a complex activity requiring a developed ability to understand a picture, convey a visual medium into a written one, observe causal relations, compose sentences, and establish coherence and meaningfulness. What was observed in our research, as well as in many national and foreign studies, is that students with hearing impairment complete a task like the one given here with difficulty and less success. The contents are written in simple language, with the use of a limited stock of words, using concrete sentences with noticeable agrammatism and misspelling, which points to the limited knowledge of more complex language structures.

Statistically significant differences in the results of students with hearing impairment and their typical peers were not observed in our sample, but it is likely that a wider sample would have shown statistically significant differences.

Considering the obtained results, we conclude that students with hearing impairment have not sufficiently developed the linguistic abilities required for writing content based on pictures in line with their age. Understanding content and the sequence of events is also done with difficulty. Writing a story in the comic-strip format was characterized by listing words, most usually nouns, which were often written incorrectly. Isolated words and sentences which were incomplete and ungrammatical were used. Various spelling mistakes, which made understanding the content more difficult, were also observed.

Based on all of the aforementioned, we can notice that the deaf children did not recognise or distinguish the important elements of the plot (retelling) from less important ones, and they failed to sufficiently perceive the entire story and understand its essence. The affective and the abstract side of the story, which lends sense to the entire story, was disregarded, and thus the students could not draw a conclusion from the story nor understand the moral of the story.

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Razvijenost rečnika kod dece oštećenog sluha u kontekstu interpretacije slika u formatu stripa

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Uvod: Slike u formatu stripa se u praksi često koriste kao sredstvo za ispitivanje razvijenosti govora i jezika dece oštećenog sluha. *Cilj:* Cilj istraživanja bio je da se utvrdi razvijenost rečnika i nivo razumevanja sadržaja slika u formatu stripa, u pisanom izrazu, kod učenika oštećenog sluha uzrasta od 11 do 15 godina (takođe da se utvrdi da li postoji uticaj uzrasta na uspešnost učenika i da se njihovi rezultati uporede sa rezultatima tipičnih vršnjaka). *Metode:* U istraživanju je korišćena priča u formi stripa dizajnirana za potrebe istraživanja. Ona se sastojala od četiri slike međusobno povezane sledom događaja. Za svaku sliku određen je broj očekivanih odgovora koje je trebalo navesti. *Rezultati:* Dobijeni rezultati ukazuju na teškoće u razumevanju sadržaja slika u formatu stripa, u pisanom izražavanju kod učenika oštećenog sluha, ali i zaostajanje u odnosu na tipične vršnjake. Uočeno je da uzrast ima delimičan uticaj na razvijenost rečnika (nema statistički značajnih razlika) ($t = -0.87$, $df = 122.9$, $p = .39$), ali se uprkos tome uočava trend porasta postignuća sa uzrastom. *Zaključak.* Uočeno je da učenici oštećenog sluha nisu razumeli priču, nisu uočili važne elemente, niti su shvatili suštinu. Apstraktna strana slika u nizu, koja daje smisao, je zanemarena, pa samim nije izveden zaključak, niti uočena poruka.

Cljučne reči: slike u nizu, rečnik, očekivani odgovori, učenici oštećenog sluha, vršnjaci tipičnog razvoja

PRIMLJENO: 21.02.2022.

REVIDIRANO: 01.06.2022.

PRIHVACENO: 04.06.2022.