

SEMANTIC DEVELOPMENT IN CHILDREN WITH MILD INTELLECTUAL DISABILITY

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Abstract

Semantics, as part of speech development in humans, is necessary for acquiring the logical-pragmatic level of language. This is achieved, by acquiring the ability to think outside of specific reality, reasoning relationships, operating with symbols, using metaphors and abstract concepts. The main objective of the research is to examine all the semantic categories and their level of development in children with mild intellectual disabilities in comparison with typical children. In this research, a total of 62 respondents were aged 12 to 14. The experimental group consisted of 31 subjects with mild intellectual disabilities. The control group consisted of children with normal intellectual abilities. The examination was done by using the "Semantic Test" by Spasenija Vladisavljević, which was adapted for the Macedonian-speaking population. Results showed that there is a connection between the acquisition of homonyms and the level of intellectual development. Antonyms are accomplished only for words with concrete meaning. Acquisition of synonyms is related to intellectual development and vocabulary richness. The research concluded that the children with mild intellectual disabilities in our research partially, and with poor representations, acquire homonyms, antonyms, and synonyms and do not acquire metonyms at all. We recommend more visual support during the speech therapy and educational process. The results of this study will be of interest to multiple audiences (including patients, their families, caregivers, healthcare professionals, researchers, scientists, and decision-makers).

Keywords: Semantic development, homonyms, antonyms, synonyms, metonyms, mild intellectual deficit.

Introduction

Human is the only living creature that has the power to speak, they can communicate with the help of language. According to Bugarski (1995): Language is one of the fundamental characteristics of human beings, a person would not be a person without language. At every moment of our conscious existence, we are surrounded by language. Bugarski (1995) gives the following definition of language: Language is a system of signs that enables a person to have a developed social and mental life, and which is realized in communication between people. Language enables each individual to realize himself on a biological, sociological, and psychological level. Modern language science distinguishes language from speech. Ferdinand de Saussure divides linguistic activity (language) into language (langue) and speech (parole). According to this author, language is an abstract entity that is obtained when all representations of words of all individuals who use a given language are collected, while speech is a concrete realization of language, the concrete act of communication itself, which is always related to a certain space and time. Bugarski (1995) believes that language is an abstract phenomenon and that in the process of communication, it is necessary to realize language, and make it available to the senses; while speech represents that realization of language. The same author states that language represents the ability to use verbal signs, while speech is the activity of using given signs. Although there is a difference between the concepts of language and speech, they are linked because

language could not exist if it was never realized anywhere through the act of communication, and speech could not be realized if there was no language that would stand at its foundation. Škiljan (1978) pointed out that speech without language is "unrecognizable" and language without speech is "ungraspable" and that they are both thesis and antithesis to each other, and their synthesis is human communication. (Dimić, 2002; Dimić and Mandarić, 2013). According to Schoenbrodt, Kumin, and Sloan (1997), communication is the basis of all human interactions, and language is the tool that enables it. As a tool, language uses symbols: auditory, visual, and gestural, which enable the child to enter social and academic society. The degree of development of these assets determines the success a person achieves in both fields.

Abilities for verbal communication are not completely regulated. The development of these abilities depends on predisposition, from anatomical and physiological structures, but this intrapersonal factor is not sufficient if the two main factors are not present. These are the social environment in which a person as a verbally communicative being develops, and the child's activity as a creator and bearer of the act and process of verbal communication (Golubivuč, 1998). The complex language structure depends on numerous functions located in different regions of the central nervous system, but it cannot develop without the influence of the external environment. The external environment, as a factor, apart from the speech development, occupies an important place in further stages of speech development, because the neurobiological basis that a child brings into the world at birth, only in interaction with environmental factors, enables speech to manifest itself at the level of complete communication (Filipova, 2013).

Comprehending a sentence involves several activities. First, it is necessary to retain the elements of the sentence in verbal memory and then to connect them into meaningful mental schemes if the sentence contains complex logical and grammatical relations (Lurije, 1983; Lurije, 1975). The relationship between words and concepts is learned and increased during cognition and vocabulary growth. Learning a language makes the thought process much easier. The level of linguistic competence can expand and accelerate figurative thinking (Keramitčievski, 1991). The semantic level of speech develops in parallel with the maturation of higher integrative areas of the cerebral cortex such as the areas of the parietal, temporal, and occipital cortex and areas of the prefrontal cortex. Semantic abilities refer to a higher form of verbal communication that is realized in tertiary areas and depends on the level of intelligence (Golubović, 1997; Ćordiĉ and Bojanin, 1992; Bojanin, 1982; Vigotski, 1977).

The development of the meaning of words, semantics, is directly related to thought activity. It simultaneously reflects lower or higher intellectual capacity. Adequate acquisition of the meaning of words presupposes experience, knowledge, and acquired lexical fund transformed into symbolic thinking (Isaković and Kovačević, 2009). The ability to recognize semantic bases between words can be assessed by examining the mastery of four categories of words: homonyms, antonyms, synonyms, and metonyms (Pandev, 2004). A homonym is a word that is spelled and pronounced the same way as another but has a different meaning. Children may use homonyms before they can semantically differentiate their separate meanings. An antonym is a word that means the opposite of another word. Antonyms become clear when children understand the concepts of opposites. These concepts are adopted when the child is older and has more mature thinking skills. A synonym is a word that means the same or similar to other words. As far as the adoption of synonyms is concerned, the author of the semantic test S. Vladislavljević sees the problem in the richness of the dictionary. Thus, despite operational schemes, the child needs to know conceptual units and have certain life experiences to form a concept and denote it with a word.

A metonym is a figurative way of expression in which one word or phrase is replaced by another with which it is meaningfully connected. Metonyms occur when sensorimotor schemes of operational thought begin to separate from the need for direct sensorimotor patterning and information begins to be processed in areas of formal operations. They require a significantly higher development of thinking powers on the representational level, to fully understand them. Then, as thought is more flexible it requires tracking from a system of labeling concepts. Metonyms develop when a certain word is associated with its emotional meaning and other

connotations, the interpretation of the word is based less on actual data and more on the meaning and essence that the word represents. Metonyms are best understood after the age of eleven with the development of formal thinking (Filipova, 2001; Kristal, 1996; Vladislavljević, 1983).

Semantic development of the child

Speech and language are acquired throughout life. A fundamental condition for acquiring speech and language is good hearing (Dimić and Mandarić, 2013). The results of a large number of studies on the child's semantic development show that the first word appears around 12 months. A greater number of internal and external factors determine the appearance of the first word, development, and sentence capacity of each individual. In an averagely developed speech environment with normal communicative stimulation, the child's semantic development is very fast. In the second year of life, the average receptive vocabulary is 1,000 words, and the expressive vocabulary is 250 words, while in the sixth year of life, the receptive vocabulary is 13,000 words, and the expressive vocabulary is 2,500 words. From the second to the sixth year of life, a child's receptive vocabulary grows by 3000 words per year, and expressive vocabulary by 500-600 words. The speed of semantic development in the following years is rapidly accelerating (Golubović, 1997). The speed of expressive vocabulary development after the age of eight decreases regardless of individual and environmental differences and conditions. The pace and level of semantic development reflect individual capacity and environmental influence and enable, according to Berg (1970), "the world of reasoning and cognition of the child" (Keramićevski, 1990).

During development, the child forms categories based on similarities and differences, first according to perceptual properties of objects, and then according to semantic relations between concepts, which can be established on complementarity based on simultaneous occurrence/activity (thematic relations) or similarities based on common characteristics (taxonomic relations). According to the findings of some studies, the transition between thematic and taxonomic categorization occurs around the age of seven, while other studies indicate that taxonomic relations occur earlier, between the fourth and fifth years of life (Obradović, Buha, and Gligorović, 2017).

Children with developmental disorders exhibit a wide range of semantic difficulties, including problems with acquiring new words, storing and organizing familiar words, and lexical access/retrieval. Unfortunately, assessments of children's semantic skills are often limited to receptive and expressive vocabulary. As a result, these children's semantic deficits may not receive the attention they need (Brackenbury & Pye, 2005).

According to Vladislavljić (1983), children with intellectual disabilities at the age of 7-8 barely reach the lowest score of children of a typical age in the category of synonyms and antonyms, while the categories of synonyms and metonyms are inaccessible to them. They are burdened by the perseveration of words and the difficult transition to a different form of thinking.

Research methodology

The objective of our research was to assess the level of semantic skill in children with intellectual disabilities, specifically homonyms, antinomies, synonyms, and metonyms compared to typical children. This is why we raised two research questions, the first one: What is the level of semantic skills in children with intellectual disabilities, and the second one, are there any differences in semantic skills among typical children and children with intellectual disabilities? To carry out the research, 62 respondents aged 12-14 participated in the research, among them was a bilingual. The sample was divided into two groups: 31 subjects with mild intellectual difficulties (16 males, 15 females) and 31 subjects with typical development (15 males, 15 females). All respondents were tested individually by a speech therapist.

The research was carried out by testing and talking to respondents, asking for explanations about the meaning of certain words. Respondents were expected to answer immediately or quickly without much explanation by the speech therapist. It is assumed that the level of semantic development of children with mild intellectual development difficulties is lower than expected for their age. Testing and discussion techniques were used to determine and verify test results and the enactment of concepts.

Participants were tested with a semantic test authored by Spasenija Vladislavljević (1983), which was adapted for the Macedonian-speaking area. The test consists of 40 words divided into 4 categories that contain 10 words in each category, the same number of examples with concrete and abstract meanings. For each correct answer, the respondent gets 1 point. For a candidate to be considered successful in the test, a correct answer is required to at least 80% of the words from each category individually (8/10), and then in total (32/40); a candidate with the correct answer to 50-80% of the questions is considered partially successful, and for 40% less correct answers in each category individually, and then considered unsuccessful overall. At the same time, it is important to understand the words, not just to give an adequate answer.

Results

Research data were grouped, tabulated, and graphically displayed using the Microsoft Office Excel 2007 program. Differences in categorical data were analyzed with the χ^2 test, and a difference at the significance level of $p < 0.05$ is considered significant in the category of homonyms, there was no statistically significant difference between the experimental and control groups ($\chi^2 = 0.29$; $df = 1$; $p = 0.59$). For this group of words, respondents from the experimental group (81.2%) as well as respondents from the control group (96.2%) were successful (Table 1)

Table 1. Homonyms

adequate answer respondents	male	female	total	χ^2	df	p
	experimental group	141 (88.1%)	119 (74.4%)			
control group	160 (100%)	148 (92.5%)	308 (96.2%)			
total	301	267	568			

Analyzing the results of the category of antonyms, there is no statistically significant difference between the groups of respondents ($\chi^2 = 0.29$; $df = 1$; $p = 0.59$), although if the results were analyzed qualitatively, insufficient addition of terms and poor vocabulary would be noticed. For this group of words, respondents from the experimental group (78.1%), as well as respondents from the control group (95%) were successful (Table 2).

Table 2. Antonyms

adequate answer	male	female	total	χ^2	<i>df</i>	<i>p</i>
respondents						
experimental group	134 (83.7%)	116 (72.5%)	250 (78.1%)	0.29	1	0.59
control group	157 (98.1%)	149 (93.1%)	306 (95.6%)			
total	291	265	556			

In the category of synonyms, children with mild intellectual disabilities were successful (80.6%) like children with typical development (93.7%). The difference between them is not statistically significant ($\chi^2 = 0.10$; $df = 1$; $p = 0.75$) (Table 3).

Table 3. Synonyms

adequate answer	male	female	total	χ^2	<i>df</i>	<i>p</i>
respondents						
experimental group	129 (80.6%)	129 (80.6%)	258 (80.6%)	<i>0.10</i>	<i>1</i>	<i>0.75</i>
control group	154 (96.2%)	146 (91.2%)	300 (93.7%)			
total	283	275	558			

As far as metonymy is concerned, children with mild intellectual developmental disabilities did not reach the same level of success (17%) as children with typical development (93.1%), but no statistically significant difference was found ($\chi^2 = 0.99$; *df* 1; *p* = 0.32). (Table 4).

Table 4. Metonyms

adequate answer	male	female	total	χ^2	<i>df</i>	<i>p</i>
respondents						
experimental group	33 (20.6%)	23 (14.4%)	56 (17.5%)	<i>0.99</i>	<i>1</i>	<i>0.32</i>
control group	154 (96.2%)	144 (90%)	298 (93.1%)			
total	187	167	354			

Statistical processing of the data showed a significant difference between the two groups. Statistically significant differences were determined at the 0.05 level ($\chi^2 = 108.01$; *df* 3; *p* = 0.001) (Table 5) (Figure 1).

Table 5. Summary table

adequate answer	Homonyms	Antonyms	Synonyms	Metonyms	total	χ^2	<i>df</i>	<i>p</i>
respondents								
experimental group	260 (81.25%)	250 (78.1%)	258 (80.6%)	56 (17.5%)	824 (64.4%)	<i>108.01</i>	<i>3</i>	<i>0.000</i>
control group	308 (96.2%)	308 (96.2%)	300 (93.7%)	298 (93.1%)	1 214 (94.8%)			
total	568	558	558	354	2 038			

Figure 1. Total result of the test for the assessment of semantic development

Discussion

Because homonyms were adopted the earliest, it is not surprising that respondents from both groups gave correct answers to almost every question. Respondents in the experimental group needed more explanations about what was being asked of them and more time to find the answers. Difficulties with verbalization were evident by frequent and inappropriate sub-questions, which indicates their poor concentration, poor verbal memory, and the need for more repetitions, subsequent explanations, and the presence of the specific situation being discussed.

By analyzing the results of the category antonyms of words, the rigidity of the thought process in children with mild intellectual disabilities in development becomes noticeable. This category of words becomes clearer by developing cognitive abilities (then when children understand the concept of opposites), and have richer experiences and vocabulary. Examples of concrete meanings (day-night; boy-girl) had correct answers, while examples of abstract meanings such as health, happiness, life, and love did not have a corresponding answer or the term was insufficiently clear and completely unknown. The problem of poor vocabulary and undeveloped experience is highlighted. It was found that even though they have the word, there is still a lack

of a concept with all its semantic connotations, which depends on operational thinking and a certain life experience that a child needs to acquire to adopt the concept. Considering the difficulty of operating space-time relations, there were difficulties in defining weather conditions (morning-evening), to which all experimental group respondents gave the wrong answer. Regarding the synonyms, the test contained words that most children are familiar with, so finding appropriate synonyms was not difficult.

Metonyms were a very difficult category for the subjects, most children with mild intellectual disabilities did not fully understand what was being asked of them in response. Some of the respondents who tried to answer did not succeed due to the inability to abstract the concrete term (primer to the question "For whom we say that it is like a bee" the answer was "For one who stings like a bee"). This indicates a lack of figurative thinking and the impossibility of generalization, which would enable the discovery of the indirect meaning of words. The test contained the word gold, which as a metonym is widespread in everyday speech and social interactions, which is why all respondents gave the correct answer, which indicates the key role of the social environment and direct experience in the formation of concepts. The score of the results of individual groups indicates that the respondents of the experimental group were only partially successful (64.4%, Table 5) in finding the appropriate word and building a concept for it. The subjects of the control group were successful in solving the test (94.8%, Table 5).

Comparing the results between the subjects from the experimental and control groups reveals a lower level of development of semantic skills in children with mild intellectual difficulties in development. It is related to the lack of flexibility in the thought process, the absence of selective attention and general attention, and intellectual deficit because intelligence and language are interconnected and the development of one of them affects the development of the other, and all this is followed by a system of labeling concepts.

Relevant studies in the field of semantics in children with mild intellectual disabilities

A lower level of development of semantic abilities in children with intellectual disabilities was also recorded in earlier studies. The author, S. Vladisavljević, constructed the test while working with children aged seven and eight, and found that the test gives better results in more intelligent children and more educated parents. This means that semantic development is enriched with new forms when the child can perceive his experiences as authentic that he can label with a term, but can also essentially distinguish between them. It was found that homonyms are developed first (80.5% of respondents were successful), then antonyms (53%), then synonyms (35%), and finally metonyms (37%). On the other side, Kulevska A. (1999) finds that mean values increase by the degree of intelligence and she obtained the best results for homonyms, then for synonyms, antonyms, and finally for metonyms. In addition to this, Filipova S. (2001), examining the level of semantic development in children with Down's syndrome, mild intellectual difficulties in development, and children with typical development, stated the following:

- Of children with Down syndrome in the homonym category, 3.33% were successful, 43.33% partially successful and 53.33% were unsuccessful. Of the children with mild intellectual disabilities, there were no successful ones, 33.33% were partially successful, and 66.67% were unsuccessful. All typically developing children were successful.
- In the category of antonyms, 6.67% of children with Down's syndrome were successful, 40% partially successful and 53.33% unsuccessful. Of the children with mild intellectual disabilities, 3.33% were successful, 33.33% partially successful and 63.33% were unsuccessful.
- In the category of synonyms, 3.33% of children with Down's syndrome were successful, and 96.57% were unsuccessful. All children with mild intellectual disabilities were unsuccessful. 73.33% of children with typical development were successful and 26.67% were unsuccessful.

- In the metonym category, children with Down's syndrome and children with mild intellectual disabilities were unsuccessful, while 73.33% of children with typical development were successful and 26.67% were successful.

As we can see, these are findings that are in line with our research results, which is crucial to underline the importance of work with this category of children, since their weakest point in speech are the above are of speech,

Conclusions and further implications

According to the objectives of the research, and based on the analysis of the results, we have the following conclusions the level of semantic development of children with mild intellectual disabilities is lower than expected for their age; children with mild intellectual disabilities have difficulties in expressive speech, which are reflected in a poor vocabulary and their incompetence in finding adequate words; they do not have clear ideas about concepts and difficulties in understanding complex verbal messages and multiple meanings of words; stagnation in the development of semantic abilities because the semantic level of language includes the maturation of higher interpretive parts of the cerebral cortex such as the tertiary regions of the parietal, temporal and occipital regions and the prefrontal cortex. there is a connection between the learning of homonyms and intellectual development, and in children with intellectual difficulties in development, homonyms are learned or not depending on their life experience; antonyms are learned only for the specific meaning they represent; learning of synonyms is related to intellectual development, experience, and vocabulary; the vocabulary of children with mild intellectual disabilities contains specific nouns and words from everyday speech; they do not use abstract words; they have difficulties with verbalization and operating with figurative speech; Partially and with poor representations, they learning homonyms, antonyms, and synonyms; they have difficulties in mastering metonyms. Our recommendation would be to encourage the usage of visual support in acquiring synonyms not just in the early intervention system, but also in the educational system since is not important the age when they will acquire, but whether will they acquire at all. The results of this study will be of interest to multiple audiences (including patients, their families, caregivers, healthcare professionals, researchers, scientists, and decision-makers).

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