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DEVELOPMENT OF CHILDREN'S CONCEPTS (WORD MEANING) AND COMMUNICATION IN THE TEACHING PROCESS

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Summary *– Children and adults do not think in the same way. The thoughts are best expressed by language (speech) and the unit of spoken thought is a concept (the meaning expressed by a word). The differences between children's language and the language of adult, mature speakers can be found by examining semantic fields of certain words. Children and adults use the words which sound the same, but have a different meaning. Because of that, there are frequent misunderstandings which are hard to notice outside the teaching process. The peculiarity of language acquisition causes the phenomenon that the word which sounds the same has a different meaning to different individuals. Children master a language by learning the words from adults in various communication instances. Communication experience, that is, the real context in which a child hears a word, is essential to the construction of meaning of that word. The meaning is determined by subconscious associative connections between the sound of a word and the mental content which has been formed with respect to the recipients' experience gained in their immediate environment. By multiplying the experience, the associative connections also multiply and semantic field of a word becomes expanded, which again leads to the creation of a mature concept. Once a concept has been formed in the mind of an individual we can be sure that a word has approximately the same meaning to different speakers.*

This paper presents the process of meaning development, from single-pronged complex to the mature concept.

Key words*: word meaning, concept, complex, pre-concept, complex thinking, conceptual thinking*

1. INTRODUCTION

Misunderstanding caused by different meaning which adults and children interpret in lexical units indicates a need to examine how a concept is being built in a child's consciousness.

A concept is, according to the dictionary of philosophical terms, one of basic forms of a thought.

From the point of view of psychology, it is defined as an idea of what is common to a large number of objects (Filipović, 1965). A concept has its gist, scope and range. The gist is sometimes defined as a set of all its features, and sometimes as a set of its relevant features. The scope is a set of all the subordinate concepts encompassed within a concept. The range is a set of all individual objects which a concept refers to. The logical procedure by which conceptual content is established is called defining.

In the Psychological dictionary (Petz, 1992) a concept is referred to as one of the basic logical constructs. It is considered to be a result of abstraction of unnecessary characteristics in related instances and establishment and generalization of important characteristics on all other related instances. We differ between narrower and broader concepts (higher and lower). For example, the concept *rose* is narrower than the concept *flower*. Narrower concepts are more concrete in relation to the broader, more abstract ones. Psychological research tries to attempt how concepts are formed in human cognition.

In the Croatian Language Dictionary (Anić, 2005) a concept is defined as a cognitive synthesis of important, common characteristic of uniform objects which has range and content.

In linguistics, the concept is related to the signified (mental image of what the word relates to) and the word with the signifier (the word, expression) (De Saussir, 2000.)

In psycholinguistics, a concept is referred to as the smallest unit of spoken thought, since it simultaneously contains elements of speech and elements of thought which are expressed through words (Vigotski, 1977).

A concept is expressed by a word, and is considered the smallest unit of spoken thought since it simultaneously contains the features of speech and features of thought. It is the focus of interest to numerous scientific fields: philosophy, psychology, linguistics, psycholinguistics, but also pedagogy and all similar scientific disciplines (didactics, methodology) because it is both the aim and the means of teaching. The concept itself reflects the vital differences between thinking processes of adult, mature people, and children.

Concept and communication

An American psychologist J.S.Bruner (1977) presented a theory in which an intelligent and adjusted thinking is conditioned by a message sent by a mature person to an immature one. According to his theory, social action and communication have a significant role in the development of intelligence. This theory relies on the theory of a Russian psychologist and psycholinguist Lev Vygotsky (1977) who considered teaching (language and communication) the starting point of human development.

Piaget ((1978; 1981) perceived language as a system of symbols to visualize the world. However, he believed that the process of logical conclusion does not involve words but actions and operations. Language does not contribute to cognition. An attempt to present and explain objects and phenomena before children show readiness for that cannot spur development. The results of a child's effort to present and explain his opinion can be misleading because children tend to repeat some actions, words and formulations without the real gist. This phenomenon is known as mere verbalism (an individual expresses the gist he actually does not understand). It often occurs in school when children are involved in group communication, and when they communicate and discuss topics that either they have not chosen themselves or the topics are not familiar to them. Moreover, these topics are discussed exactly because they are new and unknown. When communication is brought to a halt a child is often unaware of that and he does not manage to find its cause. That is why learning process cannot rely solely on verbal communication (without activities which could lead to the removal of potential misunderstanding). Children find learning which is not based on experience very tiresome and discouraging because they do not have control over activity. When learning is based only on verbal sources, if only one single word is forgotten, the whole skeleton of the ''learned content'' breaks down.

The influence of language on thinking

Piaget (1978; 1981) and Vygotsky (1977) had different ideas of the nature of language and its influence on intellectual development. Piaget claimed that language has no developmental influence on the system of thinking because speech is merely a way of presenting thoughts, and thoughts originate in actions. Although language does not create thoughts, Piaget thought that it facilitates their creation. While talking to other people, a child's opinion undergoes the process of socialisation. The attitudes of speakers can provoke and encourage new thoughts, debates, arguments. By gaining a new insight both collocutors can change their initial opinion.

Vigotsky agreed with this theory in many aspects, but he had a completely different approach to language and its influence on thinking. As well as Piaget, he thought that children do not think like adults. However, he believed that children's speech is not egocentric and self-directed. On the contrary, it is social and communicative. What Piaget calls egocentric speech is the transition between two different language functions. In the early childhood speech has both a regulative (governing) and communicative role. Speech gradually changes with the way in which children think, learn and understand, so it becomes the instrument of thought. A child who speaks to himself regulates and plans his own activities, and in that way creates verbal thinking. Adults direct a child's behaviour using speech. Once a child learns to direct other people's actions using his own speech, it has become aware of and has performed a reversible operation, cognition about lan-

guage (Vood, 1996). Autistic (egocentric) speech that he uses to talk to himself is a proof that a child has gained language control over non-verbal actions. By speaking to himself a child plays a double role: of a controller and of a controlee.

Learning and communication in the teaching process from the information theory point of view

In the 1940s there was a new scientific discipline, cybernetics, the aim of which was to establish the basic and general principles of managing the functioning of complex systems, be they organic, physical of mechanic. Cybernetics experts use the terms ***information and control*** when analysing the functioning of natural systems like human brain, but also of artificial ones like computers. That is how ***information theory***, which developed after 1984, after the publication of Mathematical theory of Communication by Claude Elwood Shannona in the Bell System Technical Journal (Matković; Sinković, 1989), and its cybernetic thoughts and terminology has entered psychology and that theoretical language has aided studying and interpretation of human intelligence. Piaget also accepted that language because he felt it could closely involve various fields: biology, psychology, philosophy, logics, mathematics etc. Many contemporary psychologists accept cybernetic terminology and language. They understand and examine human cognition as a system of organized information processing, the purpose of which is to adjust to life in community, learning and understanding.

Information theory is widely accepted in American psychology. When George Miller (1963) spoke about the nature of human psychology he perceived a man as an ''information processor''.

In his opinion, learning is processing, memory is storage, and knowledge the system of information. This creates a wide area of interest and activity for the sciences which study learning and teaching processes. Another term widely accepted in information theory should be mentioned here – ***competence***. Practice and experience become competence, that is, ability to perform a certain activity successfully. An expert and a beginner in any area differ in the fact that the expert's ability to act and think is faster, better, more accurate and confident than the beginner's. Language competence can best be achieved through practice and experience in language reception and production (communication).

The gist of a concept, information, task solution

While doing research on various stages in the development of thinking process, Piaget described numerous experiments. He ascribed children's failures in solving certain exercises primarily to the nature of children's thinking. It is not easy to agree completely with this point of view. Experience in communication with children reminds us of the difficulty to communicate with them. Piaget himself probably had doubts about the manner of communication while he was doing research, but he did not mention them in his written work.

When we plan exercises for pre-schoolers or younger students in primary school, we first come across the difficulty of presenting the exercise to a child. In this communication instance the mutual understanding between adults and children is completely interrupted. Children do not understand certain words or phrases in a way in which an adult wants them to understand.

The process of a concept development

The development of word meaning or a concept is a long process in which a child gains communication experience and connects a certain word with its gist after he has experienced different situations. As a child's experience expands, the number of experienced and separated features of a word also increases. That is, the gist denoted by a word increases. At the end of this process, from a multitude of meanings an individual manages to separate only one, the most important feature which in his mind leads to generalizations and association of all objects with the same features. When only one, important and unambiguous connection can lead to an ability to form generalizations in one's mind, we can say that a concept has been formed. The gist of words that a child was using before that is not a concept, but an entire ***complex*** (Vygotsky, 1977). Generalization (grouping of objects into the same category) in a complex is formed through concrete experiential, accidental and unpredictable connections. These connections are not a product of logical and abstract mental operations but personal experience, and they differ with respect to intellectual development stages.

Pseudoconcepts

Pseudoconcepts are the most widespread form of complex thinking of a preschooler or younger student in primary school. Complexes which correspond to the meanings of particular words do not develop freely and spontaneously, as a child's way of thinking should dictate, but in different directions predetermined by word meanings that had already been established in the adult speech. That is why a certain discrepancy can be detected in pseudoconcepts: on the outside there is a concept, and on the inside there is a complex. What causes this discrepancy? A child does not create his own speech, but acquires the speech of adults. He uses a newly acquired word in a communication instance exactly as he has heard it from others. Because of that, in speech production it is not easy to detect that a particular word does not have the same gist for a child as it does for the adults. The word a child uses is not a denotation but the name for a particular object or phenomenon. The peculiarity of this language development stage is that children actually use a word even before they have fully grasped its meaning. A word used in that way enables referential language function because it points only to the particular object of interest. Auditory form of language production does not reveal that the used word cannot refer to all objects or phenomena which are encompassed within its meaning. This gist discrepancy can be detected only when a child has to

use (understand, produce) a seemingly known word (denotator) in a new and unknown spoken communication instance. Only then an attentive listener can detect that a word and a concept in a child's mind are not congruous.

Outside school environment situations like these do not occur frequently. In his daily communication a child chooses known words and expressions independently and uses them in already learned and experienced communication instances. In adult collocutors' speech a child notices only those parts which are perfectly understandable to him. In case that a child's attention is drawn by an unintelligible message or incomprehensible parts of a speech, he seeks additional explanations or information explained by other, known words and phrases.

In school environment a child does not have an opportunity to accept only intelligible parts of information. He has to notice and produce speech units which he does not perfectly understand, so that is why it is only at school that we can detect discrepancies which indicate a discord between a word and concept in a child's mind.

2. THE STUDY OF THE GIST OF A PSEUDOCONCEPT

2. 1. THE PROBLEM OF THE STUDY

Research on children's competence for comprehending text or written notice is frequent in primary schools. Competence for comprehending a written notice includes comprehending particular lexical unite and understanding the relationship between particular items and the entire message at the surface (language) level and the deeper (cognitive) structures.

One such study which encompassed children's ability to understand written information revealed that most of the respondents (students in the 2nd, 3rd and 4th grade of primary school) wrote wrong answers to the same test question. It was necessary to see what caused this. IF the majority students do not answer correctly to the given stimulus, it can be a language factor (non-understanding of the language structure or particular language units) or intellectual factor (the question was not adjusted to the intellectual capacity of the respondents). The exam question to which students did not give a correct response (*Why did the hedgehog succeed in deceiving the wolf?)* was therefore the incentive for this research. The exam question is quite simple considering the sentence structure, so it is justified to assume that most of the younger students could understand it. However, it should be examined whether the students understood all the language units which make up this sentence. The word *succeed* was identified as a potential trigger of misunderstanding in the above mentioned question. The immediate research problem was how students in second, third and fourth grade use/comprehend the work *success*/*succeed.*

2. 2. THE PURPOSE OF THE STUDY

Research was conducted with the aim to establish whether all students, regardless of age comprehend the words success/succeed in the same way. Since students of different age took part in the study, we can monitor how that concept develops, that is, how the meaning of a concrete word develops. The research results can provide the answer to the questions:

What does the width of a meaning range of a concept depend on? Is this related to the participants' age?

2. 3. THE SAMPLE

The study of the concept *succeed* (semantic field of the words *success* and *succeed*) was carried out on the sample of 345 students in the 2nd, 3rd and 4th grade. The mentioned students attend the the Pučišća Primary school on Brač, Primary school Postira, on Brač and Primary school Meje in Split. Second grade students, 146 of them, make up six classrooms. Eighty-seven third-graders are placed in four classes, and 112 fourth –graders are placed in five classrooms. The sample of each classroom was observed as a unit in order to omit the influence of by-product variables on the results of the research (influence of teachers and teaching method, teaching conditions in schools , make up of classroom considering the experience and students' background knowledge).

2. 4. INITIAL ASSUMPTION

The word *success* (and *succeed*) is not unknown to students. However, it is assumed that in a child's mind it has not reached the stage of a mature concept which they can understand and use in any communication instance. The gist of a word (the meaning) depends on a communication instance in which individuals have heard it before. Most of communication instances in which children hear and understand the word *success* are connected with school. So, for younger students it is not a concept but pseudoconcept, which has a different semantic scope for different individuals.

2. 5. THE COURSE OF THE STUDY

During the study the students were given the study instrument (made of two unfinished sentences) and the instruction what to do with it.

These are the sentences they were supposed to finish anonymously:

Success is .....

I succeeded in .....

Although finishing the first sentence should define the word *success*, it is not justified to expect this to happen. A child's ability to define on the intellectual development stage of concrete operations includes naming the operation or activity, which this study actually proved. (*Success is when I write a test well, when I get an A, when the teacher praises me...*)

Since, due to their inability to define, the written beginning of the sentence could inhibit the students and impede the creation of syntagmatic connections among the words they want to use in their answer, another, check question was asked. It would reveal how children use the verb *succeed* in speech chain. After analysis, that should reveal the meaning they assign to that verb.

2. 6. RESULT ANALYSIS AND INTERPRETATION

The result analysis showed that an insignificant number of students do not have a mastery over the word when it is taken out of context and cannot use it in any kind of communication.

Almost all respondents connect the words *success* and *I succeeded* with their school achievements, which indicates that students have first encountered the word in communication instance concerning this topic. Individual students connect these words exclusively with school achievements.

The content they encompass by the word success indicates that it is actually a single-pronged complex, or a complex with one associative connection.

A group of the students also connect the word *success* with sport achievements. Their gist of the word success is double-pronged complex because it involves two associative connections. This indicates that a common development of the concept *success* is such that it first refers to success in school and then to success in sport (of which children most often hear from their parents).

Another group of students, besides their school and sport achievements, also connect the word *success* with some of their important achievements in their immediate environment (I succeeded in getting a present, in persuading mum to let me go to the cinema...) Their gist of the word *success* is multi-pronged complex and it is slowly reaching the level of a mature concept. Some students have managed to notice the most important feature of success (intention and implementation) and use it to make generalization (I succeeded in climbing the top of a tree because I was trying hard), so in their mind the word *success* reaches the level of a mature concept and they can use it in any new or known communication instance. These are intellectually and verbally most advanced students.

While studying the concept *success* we found out that word meaning reaches the level of a mature concept simultaneously with the multiplication of associative connections which link the word with several different communication instances. The concept development with respect to mental content and the age of students can be observed in the table below:

grade	1. incorrect answers	2. tautological answers	3. single-pronged complex	4. double-pronged complex	5. multipronged complex	6. mature concept	7. number of respondents in every grade
2nd	4 (2%)	9 (6%)	58 (40%)	47 (32%)	21 (14%)	7 (5%)	146
3rd	0	2 (2%)	32 (37%)	21 (24%)	24 (27%)	8 (9%)	87
4th	1 (0,8%)	3 (3%)	39 (35%)	18 (16%)	30 (27%)	21 (19%)	112
TOTAL	5 (1%)	14 (4%)	129 (37%)	86 (25%)	75 (22%)	36 (10%)	345

After careful interpretation of the study results from the table and through their distribution in the classes, it can be concluded that in younger school age the word *success* is actually single-pronged complex and that its meaning usually refers to school achievements.

Younger children wrote some incorrect or tautological answers (success is success). These answers were either not given at all, or were given by an insignificant number of students in the 3rd and 4th grade. This means that they do not understand the word no matter what communication instance they are involved in. In all these classes there were most students who could understand the word *success* and use it only when they were talking about school and school success.

In the 3rd and 4th grades there is an increase in the number of students who understand and use the word in various communication instances (when sport success or any other achievement from everyday life is discussed). There are few students who can use the word *success* in any appropriate communication instance. There are only 19% of them in the 4th grade.

After result analysis it is not difficult to grasp why students did not manage to answer the question in which the word *succeeded* was used in a new and unknown situation. The question was answered only by those individuals who had completely mastered the concepts *success* and *succeed* and some of those to whom the word content is multipronged complex near the level of a mature concept.

3. DEVELOPMENT STAGES IN CONSTRUCTION OF WORD MEANING (FROM COMPLEX TO MATURE CONCEPT)

The transition from complex thinking to conceptual thinking occurs throughout primary school age. During that time children mostly use pseudoconcepts. In external speech production it is hard to distinguish a pseudoconcept from concept, especially due to the fact that in children's and adults' thinking processes, throughout the course of life, pseudoconcepts and concepts co-exist. On the other hand, there is no area in psychological development where we can draw strict age

lines between stages, nor can we conclude that with the transition to a higher level of development there is a breach with behaviour patterns characteristic of lower levels of development.

The most important features of complex thinking are experiential and concrete connections between objects. Through these connections, which are frequently unrecognizable outside their real environment, an individual puts objects into groups, so the first generalizations are created in his mind. A concept is based on associating and generalizing concrete elements of experience, followed by separation of the most important elements and their observation outside the real context. Complex thinking with multiple connections impedes the analysis of elements according to a particular criterion and as well as their re-grouping. Therefore, complex thinking is not reversible.

Transitional forms of an immature concept towards mature thinking can be put into three stages (Vygotsky, 1977; pp 170-181):

1. Concrete objects are connected according to the similarities of individual elements. At that age children still do not pay the same amount of attention to all features, but they can neglect those which are not in the focus of their interest. This is the first step towards abstraction.
2. In the second stage potential concepts are created. A child can then associate objects according to a single common feature, which is usually connected with the object function. This peculiarity in thinking is supported by children's definitions. A child defines any subject by naming what that object does or what it is used for. A potential concept differs from a mature concept in the separated feature, which has been privileged for some reason in a child's hierarchy of features. That is the reason why one child defines a cat in one way (''a cat is when it drinks milk''), and another child has a different definition (''a cat is when it chases mice''). One child defines his grandfather by a feature that does not necessarily determine that concept (''he takes you for a walk''), and another child defines it by another feature (''he buys you chocolate''). Although some pre-concepts never reach the level of mature concepts, they do play an important part in the development of conceptual thinking. By separating particular features from a set of objects a child destroys the real context and thinks about an object when it is not concrete.
3. In the third stage concepts are finally created. This occurs when a series of abstract features reunite and that abstract synthesis becomes the basis of thinking process. Words play the crucial role in this process. They force a child to direct his attention willingly to certain object features. With the help of words a child builds the separated features into an abstract concept and uses words as signs.

Complex thinking cannot be created without language (the use of words) either. A word in complex thinking encompasses only one ''family'' (objects con-

nected in some way), not all the objects the term can refer to. It is interesting to point out that in children's thinking one word functions as a concept at the same time as other words function as complexes.

This is an example that has been proved in Pučišća Primary School (23/27): most of first-graders use the word *sjedalica* (chair) as a name for a mature concept. Therefore, they do not have to imagine a concrete chair to understand the word, since the word gist encompasses most of objects used for sitting. Unlike them, some first-graders (4/27) associate the word *sjedalica* (chair) with wooden chairs or cinema seats because they have encountered that name in school environment or cinema. Other chairs, mostly the upholstered ones, do not belong to the same category because at home or other people's homes they call them *katrîda*. It is only after a warning about the same feature of all of these objects that a child begins to connect both groups of chairs in his mind.

It is easier for children to acquire concrete concepts, the features of which they can actually experience. That is why the same individuals who can successfully handle abstract features of the concept *stolica*, do not abstract features of the concept *mother* in the same way. A small child thinks that mother is another name for his mother so he does not understand that anyone else can also be a mother. First-graders understand that other children have mothers as well, but to most of them it is not clear that adults have mothers, too. Therefore, the basic feature of the concept *mother* has not been abstracted by them since, in their own experience, they have not encountered it often (children do not perceive a woman to be a mother if a child is not beside her, or if her child does not need a mother).

Unlike Piaget, Vygotsky thought that development of thinking does not end in adolescence. The readiness or maturity to think abstractly does not mean that abstract thinking will become an exclusive or predominant form of intellectual behaviour. Formal-logical operations are more appropriate for certain areas of human activity, and outside that area people still continue to think concretely and in a complex manner. Success in performing formal-logical operations depends on practice or experience. That is why it is incorrect to say that development of thinking ends in adolescence. It is more correct to claim that maturity triggers the possibility of extensive or frequent exposure to operations of abstract thinking and more successful conclusion.

Acquisition and definition of a concept

Development stages or steps in mastering a concept have been identified in psycholinguistic studies carried out by Vygotsky and his assistants. The sequence of these steps is the same both for children and adult speakers:

1. the use of a concept in the real environment (observation)
2. the transfer of a concept to a new observation process (application in other communication instances)
3. definition or explanation of a concept

It has been confirmed without doubt that a concept is much easier to use in speech and writing than to define it in words. Concepts are created in the process of problem solution and are the result of thinking, that is, intellectual operations (observation, association, generalization, separation, analysis). It is not possible to transfer them or to acquire them as finished products.

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