

LARISA KALMYKOVA

Pereyaslav-Khmelnyskyi State Pedagogical University named after Hryhorii Skovoroda,
Pereyaslav-Khmelnyskyi, Ukraine

Diagnostics and Description of Children's of Five Speech in Terms of Inner Programming and Grammatical Structuring

Summary

Introduction

Diagnostics and description of children's of five speech in terms of inner programming and grammatical structuring operations are showed here. The article is dedicated to the actual problems of psycho-linguistics of the development, particularly to the research of grammatical-structuring operations in children of senior pre-school age. It elucidates the opening of meaning of these experimental facts as the preconditions of lingvo-didactic perfection and realization of principles of perspectiveness and continuation.

Aim of the study

To give the detail analysis of grammatical mounting of speech of senior pre-schoolchildren – as a pre-condition of making the effective technologies for speech development of children and realization of perspectiveness and followingness in the development of communicative abilities in children on the intermediate links of linguistic education – the pre-school and elementary school ones.

Materials and methods

Functional analysis of the higher psychic functions, in particular, oral utterance of children in an operational way, diagnostics of the state of speech functions for the analysis of children's readiness to school education and for finding the causes of difficulties (real and potential) in speech formation; analysis of not enough developed links of functional system, which provide the children's speech function and principally influence on the understanding the causes of unsuccessful speech activity mastering. 365 children aged five participated in our experiment.

Results

It was found that 30% of all lexemes in children's speech are nouns; 38% - verbs; 17% - adverbs; 9% - pronouns; and only 2% - adjectives and 1% - link words. Common for all the children peculiarity was the full absence in their speech the verbal adverbs and very rare use of participles, pronouns, adjectives, prepositions – those words the using of which influence on the level of widening of the structure of the sentence.

Not direct word order testifies the inability to keep the program in mind. The inversion appears in the cases when the process of sense widening stipulate the rebuilding of inner program. And it takes place in children in the moment when in outward speaking arises the need to use the word in the second or third distant positions.

The great complication for children makes using of indirect cases with prepositions and without them, at the time when case-preposition forms, their meaning perform the most important in speech production function. Pre-schoolchildren do not know how to express adverbial modifiers with the help of forms of indirect cases with prepositions. They feel difficulties also in expressing attributes by different forms.

Conclusions

Pre-schoolchildren feel difficulties in using in their speech the cases and prepositions which are necessary for providing the full of value realization of inner speech intention and grammar transformations, that is for inner speech and outward widening of sentential utterances, formation of which is making in realization of speech activity through passing the stages of speech production: from motive and intention to the whole and widened utterance.

Making the effective and productive technologies of children's speech development is possible in the case if demands correspond to the development of children's higher psychic functions and they fall into the near boundaries of zones of the development of a child; if formational influences have developmental character, prepare perspectively the pre-schoolchildren to further education.

Key words: pre-schoolchildren, speech, mechanism of speech, speech production, operations of inner programming, operations of grammatical structuring.

Introduction

On the modern stage of the development of psycholinguistics there is a task for researchers of further working out the problem of speech mechanisms. In particular, such complementary considering needs the problem of speech production specifics in children of pre-school age, for whom are typical the difficulties of actualizing the words, their choice according to the form and also for building the wide utterances.

At present development of speech knowledge it is not enough to say that children have some speech difficulties: it is important to analyze what exact complications "experiences" in them the utterance; which of the components of functional system of speaking "is backward" and makes more difficult the monologue mastering? Solving these problems will allow: to model the correctional help in a proper way, taking into account the regularity of speech functions formation, their dynamic organization and localization; to make optimal correctional and developmental education.

That is, diagnostics and description of peculiarities of children's speech need the solving of the tasks of psycholinguistic character, connected with studying and specifying the mechanisms of constructing the connected utterances and its grammatical mounting in senior pre-schoolchildren.

At this time, exacting of these peculiarities is very important in a practical plan: the absence of stable psycholinguistic tradition in learning the children's speech cause the fact, that teachers always meet in pedagogical process the children's speech and they neither make diagnostic correctly, nor analyze it, and, as a result of it, the work over the development of children's speech, elimination of defects in its grammatical structuring is doing by educators intuitively, without any address direction to the mechanisms of speaking. That is why the pedagogical influences of teachers remain not very effective.

Hence, for scientific substantiating of technologies of the development of pre-schoolchildren's speech it is necessary to know not only the regularities of the process of speech skills and abilities formation, but to imagine perfectly the mechanisms of native language speaking. The more the practical work will use this knowledge, the greater will be our opportunities in making perfect psycho-techniques, the more effective will be the final result concerning skills of communication and pre-schoolchildren's speech.

Because of the necessity of solving the scientific and pragmatic problems of the development of children's speech we put the aim: to give the detail analysis of grammatical mounting of speech of senior pre-schoolchildren – as a pre-condition of making the effective technologies for speech development of children and realization of perspectiveness and followingness in the development of communicative abilities in children on the intermediate links of linguistic education – the pre-school and elementary school ones.

Materials and methods

For revealing the senior pre-schoolchildren's speech peculiarities, as a necessary basis of psycholinguistic corrective formation of their speech activity, we made the functional analysis of the higher psychic functions, in particular, oral utterance of children in an operational way, taking into account the fact, that speaking involves several operations, similar for organic and functional genesis and topicality, for the unique principle of work – „factor“ (O. R. Luria, T. V. Ahutina).

Diagnostics of the state of speech functions in children was grounded on the imaginations of neurophysiologists, neuropsychologists and neurolinguists according to the „standard meaning of

investigated psychic phenomena" (E. D. Homska), „neurolinguistics of norm" (T. V. Ahutina), that is the typology of children's norm, that means the explanation of normative development of psychic functions and their individual peculiarities in ontogenesis as a result of the development or work of correspondent links of functional system (neuropsychological factors) (Ахутина 2004, 737–748; Калмикова, Харченко, Дем'яненко, Порядченко 2006, 304). Such diagnostics is very important for the analysis of children's readiness to school education and for finding the causes of difficulties (real and potential) in speech formation.

Studying the speech of children was concentrated mostly on the analysis of not enough developed links of functional system, which provide the children's speech function and principally influence on the understanding the causes of unsuccessful speech activity mastering. Normally developed children in speech sense were compared with children who lag behind in this meaning and also with speech norm of adults. In that way was studied the typology of „low" children's norm that makes some difficulties in education (Ахутина 2004).

Senior pre-schoolchildren's speech was analysed from the point of view on exposing the levels of their knowledge of speech operations of grammatical structuring and choice of words according to the form and finding the possibilities for further development of these operations in the connection of inner programming and linguistic meaning choice in the nearest zone of their semantic connections.

At this time we took into account the existed in psycholinguistics thesis: taking into account the grammatical possibilities of native language and connected with it necessity of grammatical transformations – is a branch of superficial outward grammar, but not psychological (semantic, content) one (Ахутина 2002).

Learning the operations of grammatical structuring (grammatical structure of separate and wide utterance) as one of the central link in the structure of speech production as a whole and realization of speech activity in particular the research was realised through the investigation of spontaneous children's speech and through the specially worked out communicative task, that demand from children an independence and activity in making the plan of the utterance. The utterances made by children is the result of their thinking and speech creation. That is, the logic operations of grammatical structuring are the best reflected in them.

In our experiment participated 365 children whose age was five years.

Results

Because the different levels of speech structuring development are marked on the correlation of the parts of speech in children's utterances we made lingo-statistical analysis of words according to the parts of speech.

Table 1
Distribution of words in children's of five utterances in comparison to adults (in %)*

№	Parts of speech	% using in children	% using in adults
1.	Nouns	30%	28%
2.	Verbs	38%	15,8%
3.	Pronouns	9%	10,6%
4.	Adverbs	17%	7,6%
5.	Adjectives	2%	9,6%
6.	Link words	1%	20%
7.	Numerations	0%	1,4%
8.	Verbal adverbs	0%	3,3%
9.	Participles	2%	4,5%
10.	Separate group of words	3%	0%

*In connection with a fact that we made the distribution of word according to the parts of speech while used the functional analysis, but not traditional language classification, it was aimful to single out in this table №10 the separate group of words which had not anyone and did not perform in children's utterances any formal grammatical loading: they were not referred to this or that part of speech. These unnecessary in outer speech words are light-minded word-forms. But in functional way their presence in children's speech testifies about poor formation of operations of inner programming, in particular the widening of the program and about the trying of children with a help of such light-minded words to point to the thinking shape of the situation and with their help, as a compensative means, to make further process of utterance, continuing to recreate in such way in oral speech the shape of situation, without interrupting the utterances and breaking (for himself, but not for interlocutors who percept the information) the inner speech program of his/her thinking and speech intention.

It was found that 30% of all lexemes in children's speech are nouns; 38% - verbs; 17% - adverbs; 9% - pronouns; and only 2% - adjectives and 1% - link words. Common for all the children peculiarity was the full absence in their speech the verbal adverbs and very rare use of participles, pronouns, adjectives, prepositions – those words the using of which influence on the level of widening of the structure of the sentence.

Hence, not wide using or full absence in children's speech of such parts of speech, as we see it, is connected with low level of grammatical structuring and choice of the form of words operations formation which cause the unsuccessful widening of sentences, limitation in differentiation, choice of syntactical structures and words.

Correlation in sentences between these or other its members (main and secondary) is also the important feature of successfulness and stability of grammatical structuring logic operations. Words in sentences, in dependence of what role does this member play, may be in different "distant positions" (M. R. L'vov) as to the subject and predicate (Львов 1979).

Revealing in children's speech "ranking of distant positions" (M. R. L'vov) will be a feature not only of a level of grammatical structuring development, but a good formed operational speech memory, that plays a leading role in keeping in mind the program of utterance, that is in providing inner programming when during the process of speaking one of the structural parts of a program widens and others keep in mind as unwidened ones, fixed by inner (shortened) words that may be reduced to one or two syllables.

The more percents fall to secondary parts of the sentence, the higher are the ranks of distant positions of the words in a sentence, the greater is the volume of operational speech memory, the better keeps in memory the program of utterance, the sense of which adequately recreate and transform necessary for speaker the content of thinking imagination, that gives the opportunity to choose effectively the objective linguistic meanings.

Table 2
Distribution of the members of sentence in utterances of children of five (in%)

Members of sentence	Main		Secondary		
	Subject	Predicate	Object (near the predicate)	Adverbial modifies of place and time (near the predicate)	Attribute (near the predicate)
% using	25,38%	42,9%	10,12%	21,5%	0,1%

Data of a table, made on the basis of conducted experiment, testify that correlation between the members of a sentence in children's utterances do not allow their normative widening and realization of communicative intentions. Rapid raising of several predicates is provided by sentences with homogeneous

predicates and not extended ones, in which are absent one or some needed members, about which, as a rule, is possible to guess from the situation if an interlocutor knows it.

The order of members of a sentence distribution in children's utterances, as a rule, is the next: the words are in the first and (as an individual cases of usage) in the second distant positions, for example, in sentences: "The children drive in a sledge" – "in a sledge" the first distant position; "They make a man from snow" – "snow" – is the second distant position. The word "snow", that is used in the second distant position, testifies, that keeping in mind the program of utterance makes some difficulties for children: one of the components of the program widens "to make a man" and the other one – "from snow" doesn't fix and keep in mind.

The fact of using the word "from snow" in a correlating position to a word "man" corroborates the impossibility of children to keep the inner program of utterance, and after finishing the sentence "They made a man" again to come back to the image situation and to continue to build the previous program "man from snow", "The snow falls from the cloud...falls from blue and dark".

By this fact, may be, is possible to explain the fact that many children of a pre-school age keep not direct, customary word order, but an inversional one, when the used members of a sentence do not have its steady, traditionally fixed place. The children's utterances with such word order are perceived as unusual ones.

Not direct word order testifies the inability to keep the program in mind. The inversion appears in the cases when the process of sense widening stipulate the rebuilding of inner program. And it takes place in children in the moment when in outward speaking arises the need to use the word in the second or third distant positions.

Inability of pre-schoolchildren to keep in mind the program of an utterance appears because the need every time in a new way to build a program in order to say the whole content of a thinking image of a visual situation: "They drive... they drive... over head they drive in a sledge...and it is a sledge they drive over head, and here is a pine tree... it is frozen".

In order to get more detail and exact image about operations of grammatical structuring by children we used the comfortable for making sums index that shows the level of syntactical structures widening in which in % correlation we show the used by children parts of speech in a structure of a sentence by expressing the members of a sentence (look table No. 3).

Table 3
Distribution of the parts of speech by expressing the main and
secondary members of a sentence in children of five in (%)*

Members of a sentence	Parts of speech							
	Nouns	Verbs	Pronouns	Adverbs	Adjectives	Numerals	Verbal adverbs	Participles
Subject	60%	–	82%	–	–	–		
Predicate	–	100%	–	–	95%	–		–
Attribute	–	–	–		5%	–		–
Object	26%	–	18%	–	–	–		–
Adverbial modifies	14%	–		80% – place 20% – manner of action	–	–	–	
Total	100%	100%	100%	100%	100%	0%	0%	0%

By a sign "–" in the table No. 3 are showed the potential variants of using the parts of speech in a role of the main and secondary members, the usage of which can influence greatly on a length of sentences and on a level of grammatical structuring operations successfulness.

The table No. 3 testifies that the nouns (about 60%) are used by pre-schoolchildren in nominative case for expressing the subject, 26% of the nouns in the indirect cases are used for expressing the objects (put the birds, didn't catch the rabbit: ate the piece of watermelon; to prepare from a fish; draw with water colours; hunt for a gout; give the friend; promised Nataalka; swam to a shore; were swimming in a river etc); 14% of the nouns are used for expressing the adverbial modifies (went out in a street; observed from the window; turned to a shop; went out of a forest etc.).

The characteristic feature of children's speech is verbality. The basic group make the verbs of movement (E.g. go, run, walk, cross); verbs, connected with professional activity (sing, draw, learn). Children use the verbs in a meaning of a predicate. From already made predicates the pre-schoolchildren frequently use compositional verbal ones (E.g. The cloud started to go away. The sun started to set. The children want to play. The girl started to feed the kitten).

17% in children's speech take the adverbs of place (flowed nearly; not far there is a forest) and place (from the morning he came, at first he decided). More seldom are used the adverbs of the manner of action (go calmly, hunted good).

The characteristic peculiarity of children's speech is the fact, that they use the adjectives and use them, as a rule, in the meaning of a predicate (E.g. The mother's voice became severe. Peter was a good master).

10% in children's speech take pronouns, that functions in a sentence as subjects (E.g. He draws. They found a hedgehock); or objects (E.g. He has a constructor).

Hence, the children do not use all potential possibilities of the parts of speech in making and widening the structure of utterance.

Exactly good index of the level of a grammatical structuring operations development in children (especially operations in word choice according to the form in widening the speech structures) is the distribution of words according to the cases, which depends from used kinds of word combinations and kinds of sentences and also from grammatical connections of words in syntactical constructions.

That is why we made the analysis of case distribution in children's speech, that testifies, from one hand, about their homogeneousness, and, from the other hand, - about difficulties in differentiation, choice of some cases and break of syntactical connections between the words.

Table 4
Distribution of cases in senior pre-schoolchildren's speech*

Cases	Children	Adults
What? Who? (I have a <i>toy</i> ; A <i>pencil</i> is in a box; The <i>boy</i> is in the room) Називний (in Ukrainian)	61%	32,5%
What? Whose? (I have no <i>toy</i> ; I see the <i>boy's</i> book) Родовий (in Ukrainian)	1%	22%
Whom? (I give a <i>toy</i> to a <i>boy</i>) Давальний (in Ukrainian)	4%	4,1%
Whom? What? (I found a <i>boy</i> ; She took a <i>toy</i> with her) Знахідний (in Ukrainian)	20%	25,3%
What ... with? (I play with a <i>toy</i> ; He opened the door with a <i>key</i>) Орудний (in Ukrainian)	7%	5%
On what? (The fly sits <i>on</i> a <i>toy</i>) Місцевий (in Ukrainian)	7%	11,1%

*This table characterises only Ukrainian language where are six cases (in English language they have two – common and possessive ones).

The great complication for children makes using of indirect cases with prepositions and without them, at the time when case-preposition forms, their meaning perform the most important in speech production function: in realization of the program, made in the process of inner programming and choice of the situational meanings of words, and also in providing the model of further widening of the utterance.

So, in particular, the great difficulties the children feel in using the cases and prepositions in expressing objects, especially, E.g. "reading of the books", a bottle of a milk", "to meet friends" etc.

The pre-schoolchildren do not know how to express the adverbial modifies with a help of forms of indirect cases with prepositions (E.g. in, about, from etc). They feel difficulties also in expressing attributes by different forms (E.g. the book of a friend, a cry of a child, a sun looks like his father and so on).

Conclusions

As conducted diagnostics testifies the pre-schoolchildren feel difficulties in using in their speech the cases and prepositions which are necessary for providing the full of value realization of inner speech intention and grammar transformations, that is for inner speech and outward widening of sentential utterances, formation of which is making in realization of speech activity through passing the stages of speech production: from motive and intention to the whole and widened utterance.

That is, making the effective and productive technologies of children's speech development, realization of followingness and perspectiveness on a pre-school and primary school levels is possible in the case if demands, that are put before pre-schoolchildren and their speaking, correspond to the development of their higher psychic functions, are in the near boundaries of zones of the development of a child; if formational influences have developmental character, prepare perspectively the pre-schoolchildren to further education, giving them in time the adequate linguistic material for full value development of their speech functions.

But, to a great pity, up to nowadays the program demands were not looked through according to appreciation of a state of the development of children's speech.

The trying to build up the educational technologies with taking into account the brain mechanisms of the speech process and characteristic for right and left hemispheres of the brain ways of transformation the information is showed in collective monograph (Калмикова, Харченко, Дем'яненко, Порядченко 2006).

References

1. Ахутина, Т. В. (2002). *Нейролингвистический анализ динамической афазии* [Neurolinguistic Analysis of the Dynamic Aphasia]. О механизмах построения высказывания. Москва: Теревинф, с. 144. (in Russian).
2. Ахутина, Т. В. (2004). Нейролингвистика нормы [Neurolinguistics of the Norm]. In: Хомская, Е. Д. (отв. ред.) *Хрестоматия по нейропсихологии* (с. 737-748). Москва: Институт общегуманитарных исследований, Московский психолого-социальный институт (in Russian).
3. Леонтьев, А. А. (2001). *Язык и речевая деятельность в общей и педагогической психологии* [Language and Speech in General and Pedagogical Psychology]: Избранные психологические труды. Москва: Российская академия образования; Московский психолого-социальный институт, с. 447 (in Russian).
4. Лурия, А. Р. (2002). *Основы нейропсихологии* [Basics of Neurology]: Учебное пособие для студентов вузов, обучающихся по направлению и специальности психологии. Москва: Академия, с. 381 (in Russian).
5. Львов, М. Р. (1979). *Тенденции развития речи учащихся* [Developmental Tendencies of Pupils' Speech]: Пособие для студентов педагогического института. Вып. 2. Москва: Министерство просвещения РСФСР, Московский государственный педагогический институт им. В. И. Ленина, с. 79 (in Russian).

6. Калмикова, Л. О., Харченко, Н. В., Дем'яненко, С. Д., Порядченко, Л. А. (2006). *Розвиток мовлення дітей старшого дошкільного віку* [Speech Development of Eldest Preschool Children]: Монографія. За заг. ред. Л. О. Калмикової. Рекомендовано Міністерством освіти і науки України як навчальний посібник для студентів вищих навчальних закладів. Київ: ПП Медведєв, с. 304 (in Ukrainian).
7. Хомская, Е. Д. (2004). Латеральная организация мозга как нейропсихологическая основа типологии нормы [Lateral Formation of the Brain as Neuropsychological Basis for the Typology of the Norm]. In: Хомская, Е. Д. (отв. ред.) *Хрестоматия по нейропсихологии* (с. 705-710). Москва: Институт общегуманитарных исследований, Московский психолого-социальный институт (in Russian).

Prof. Candidate of psychological sciences **Larisa Kalmykova**

Pereyaslav-Khmelnytskyi State Pedagogical University named after Hryhoriy Skovoroda

Address: Suhomlynskiy str. 30, Pereyaslav-Khmelnytskyi, Ukraine

Phone: 380 688058441

E-mail: psycholing-lab@mail.ru