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L. B. Baryayeva, L. V. Lopatina
St. Petersburg, Russia

**METHODS OF RESEARCH AND ASSESSMENT OF GRAPHIC
COMMUNICATION SKILLS OF THE CHILD AS A POTENTIAL
USER OF SUPPLEMENTARY AND ALTERNATIVE
COMMUNICATION SYSTEM**

Abstract. The article deals with the issues of teaching children with disabilities, among whom ‘non-speaking’ children make up a considerable part, by means of supplementary and alternative communication. The authors provide a description of the means of supplementary communication which can be recommended for communication with children in cases of marked oral speech deficiency. It is imperative for non-verbal support supplementing utterly limited opportunities of the verbal communication means usage, and ensuring comprehension of verbal information and interaction with the surrounding world. The article describes a system of alternative communication means which should be used with non-speaking children in case of absence of oral speech. The system of alternative communication includes gestures and graphic symbols and symbolic objects. The authors single out categories of children for whom it is desirable, and sometimes necessary, to offer supplementary and/or alternative communication for interaction with other people.

The article demonstrates the effectiveness of teaching how to use alternative and supplementary communication taking into account certain conditions. They include the following: algorithm of learning and introduction of graphic symbols; formation of understanding of the meanings of the symbols introduced; realization of the opportunity to use the symbols learnt immediately to solve communicative problems; constant support and commentary of any communicative signal produced by the child; application of various forms of interaction; inclusion of teaching communication as an inseparable part of the child’s life in the educational, rehabilitative and developing process and the process of family education; polysemantic nature of the symbols content, etc.

The article outlines the system of pictographic code and the methods of investigation and assessment of graphic communication. It substantiates the

necessity of choosing the communication means which maximally suit the given child, taking into account the specificity of their development and state of oral speech. The authors suggest a procedure of detection and assessment of communicative, cognitive, linguistic, psycho-social and motor abilities of the child as a potential user of supplementary and alternative communication systems.

The methods of research and assessment of graphic communication are necessary in order to test the capability of each child to perceive the pictographic code. With this end in view, the authors suggest a scale of graphic communication skills presupposing observation and assessment of the child's abilities to perceive and transfer graphic information. It includes the study of graphic perception, ways/means of graphic expression and techniques of manipulating symbolic images, and opportunities of graphic transfer of information. All tasks presented in the article have been made up on a uniform plan and include a research procedure description, an instruction, stimulus material and an evaluation system.

Keywords: alternative communication; supplementary communication; pictographic code; graphic communication; children with disabilities; logopedics.

About the author: Baryayeva Lyudmila Borisovna, Doctor of Pedagogy, Professor.

Place of employment: Department of Logopedics, Herzen State Pedagogical University of Russia, St. Petersburg, Russia.

E-mail: alesej@yandex.ru.

About the author: Lopatina Lyudmila Vladimirovna, Doctor of Pedagogy, Professor.

Place of employment: Department of Logopedics, Herzen State Pedagogical University of Russia, St. Petersburg, Russia.

E-mail: l.v.lopatina@mail.ru.

World pedagogical practice has accumulated sufficient potential in the sphere of application of various means of non-verbal communication [1; 2; 13; 15; 16; 17]. Using alternative and supplementary systems of communication means, we can considerably develop the communication skills and raise the lin-

guistic potential of the child with disabilities, widen their knowledge about the surrounding world, and form the child's autonomy and independence.

The system of *supplementary communication* means is necessary in cases of marked oral speech deficiency for non-verbal support sup-

plementing utterly limited opportunities of the verbal communication means usage, and ensuring comprehension of verbal information and interaction with the surrounding world. The term component “supplementary” underlines that teaching such kind of communication ensures support in speech development and grants an opportunity to use supplementary means if the child does not acquire oral speech after all.

The system of *alternative communication* means is efficient in case of absence of oral speech and presupposes acquisition of a special system of communication, in which non-verbal communication means are the basic ones. The system of alternative communication includes gestures, graphic symbols and symbolic objects [2; 15; 16; 17].

Supplementary and alternative systems of communication can be used by:

- people for whom the systems under consideration serve as basic expressive means in the process of communication. For example, they understand speech addressed to them well enough, but cannot express their needs verbally (children with cerebral palsy, moderate intellectual disability, autism, anarthria, etc.). In these cases, they use the means of supportive communication throughout life;
- people experiencing problems with language acquisition (for ex-

ample, children with moderate intellectual disability, autism, etc.). In most cases, they can master extremely limited verbal communication means, and need supportive communication means temporarily;

- people unable to use oral speech as a communication means (for example, in cases of severe multiple developmental disorders). In these cases, supportive communication means function as language substitutes, as an alternative to the absent oral speech.

The main tasks of teaching alternative and supplementary communication systems are the following:

- formation of the skills of visual and/or auditory concentration upon the speaking and/or gesticulating interlocutor, “speaking” and musical toys, realistic pictures, photos, and graphic symbols;

- formation of the skills to distribute attention between an object, image, and symbol/symbols as means of communicative problem solving;

- formation of a wish or need to imitate emotional, gestural, pantomimic and verbal strategies of interaction with the interlocutor;

- formation of the skills to imitate everyday life, instrumental and game-based actions, ability to perform them in a certain order in various communicative situations (situation-personal, business-personal, object-oriented communication);

– formation of the skills to understand the essence and necessity of establishing communication and its consequences;

– formation of the skills to understand gestures, realistic images, words, graphic symbols, their sequences, which are used to express direct address of one interlocutor to the other;

– activation of the child's non-verbal intellect;

– acquisition of the corresponding instruments of alternative or supplementary communication system;

– activation of the corresponding response strategies on the basis of the communication means already acquired;

– formation of the need to independently initiate communication with other people with the help of the alternative and/or supplementary communication means;

– automation of the elementary communicative skills acquired in various situations in accordance with the communicative aim (task).

The effectiveness of teaching application of alternative and supplementary communication may be ensured by provision of certain conditions: algorithm of acquisition and introduction of graphic symbols; formation of understanding of the meanings of the symbols introduced; realization of the opportunity to use the symbols learnt immediately to solve communicative problems; constant support and

commentary of any communicative signal produced by the child; application of various forms of interaction; inclusion of teaching communication as an inseparable part of the child's life in the educational, rehabilitative and developing process and the process of family education; proper attention to the needs and interests of the child; combination of various tools of instruction; polysemantic nature of the symbols content, expansion of the range of communicative partners and communicative situations the level of variability of which is determined by their potential content actualized by the lexicon, arsenal and conscious acquisition of the communication means, the child's level of independence, object and nature of help, and the strategies of the communicative behavior stimulation.

The term "pictogram" means a symbol representing a concept, object or activity by illustrating. Pictograms can be classified into various categories in accordance with the object or idea they reflect. The advantage of using symbols – pictograms – consists in the fact that all communication members can operate the same images and easily orient themselves among them [1; 13; 15; 17].

In order to choose the communication means which maximally suit the given child, taking into account the specificity of their development and state of oral speech, it

is necessary to detect and assess the communicative, cognitive, linguistic, psycho-social and motor abilities of the child as a potential user of supplementary and alternative communication systems.

Before using pictograms, it is necessary to make sure that the children can perceive the pictographic code. With this end in view, we suggest a scale of graphic communication skills presupposing observation and assessment of the child's abilities to perceive and transfer graphic information. The research methodology presupposes the following stages.

1. Research of graphic perception

Research purpose: determination of graphic perception opportunities.

1.1. Study of the character of graphic perception

Research procedure. The child is asked to look at: photos, pictures (realistic images) [3]; pictures, the content of which is easily understood even if they are stylized. Then, the child is asked to point at the object named by the teacher-logopedist.

Instruction: "Please, show us where..."

Stimulus material is presented by the topical blocks [14] "This is me", "My toys", "My family", "My house", "My school", "The world of colors and sounds", "Animal

world", "Plant world", "Natural phenomena", "The world of man", which ensures the emotional and socio-personal development of the children, the formation of their ideas about themselves and about the surrounding object-oriented and social reality. The amount of the stimulus material is determined by the children's age and the Program [14]. It should be noted that the names of the blocks and their inclusion in the Program are subject to variation depending on the children's age and grade.

Assessment system takes into account the following parameters: whether the child shows interest in the stimulus material presented ("interest" means any kind of response on the part of the child who realizes that what they have before them is a representation of reality but not just a bit of paper); whether the child needs "controlled" recognition (participation/help of the teacher-logopedist) of the stimulus material (the amount of stimuli, the kind of images, the character and effectiveness of participation/help).

The assessment system also takes into account the number of the images named; the naming method (vocalization, sound imitation, syllable, word, pseudo word); kind of images; whether the child needs help; the character and effectiveness of help.

Assessment level may be presented in the following way.

High — the child shows interest in the stimulus material presented irrespective of its complexity; points at the majority of the named images independently.

Medium — the child shows interest only in realistic images; recognizes the majority of them; needs “controlled” recognition (help of the teacher-logopedist) of the complicated stimulus material; need of help is expressed by actively attracting attention; help is effective.

Low — the child shows no interest even in realistic images; recognizes few of them; needs their “controlled” recognition or even teaching; help in the form of actively attracting attention, in the form of a model/algorithm of task completion it is not effective.

1.2. Study of spontaneous recognition skills

Research procedure. The child is asked to look at: photos, pictures (realistic images); pictures, the content of which is easily understood even if they are stylized. Then, the child is asked to name the object shown by the teacher-logopedist.

Instruction: “Please, tell us what/who it is. What is ... doing?”

Stimulus material is the same as in Task 1.1

Assessment system rests on the same parameters that are used in the previous task: whether the child shows interest in the stimulus mate-

rial presented; whether the child needs “controlled” recognition (participation/help of the teacher-logopedist) of the stimulus material (the amount of stimuli, the kind of images, the character and effectiveness of participation/help).

The assessment system also takes into account the number of the images named; the naming method (vocalization, sound imitation, syllable, word, pseudo word); kind of images; whether the child needs help; the character and effectiveness of help.

The following *Assessment levels* are possible.

High — the child is capable to name the majority of images from the stimulus material with the help of the means accessible to them (vocalization, sound imitation, syllable, word, pseudo word) irrespective of their complexity.

Medium — the child is capable to name the majority of realistic images with the help of the means accessible to them; needs active help of the teacher-logopedist (in the form of naming the first one or two syllables of the word) while naming the more difficult stimulus material; help is effective.

Low — the child does not name (or names only a few) realistic images; help in the form of naming images by the teacher-logopedist for the child to repeat is not effective.

1.3. Study of the skill of controlled recognition of one of the symbolic images, the meaning of which is suggested by the parts of the object

Research procedure. The child is shown symbolic images (pictograms) one after another and is asked to point at the one named by the teacher-logopedist.

Instruction: “Please, show us where...”

Stimulus material. Pictographic images: head with plaits = a girl [5]; square with a triangle above it = a house [8]; head with long ears = hare [6]; circle with vertical lines inside and along the circumference = hedgehog [6].

Assessment level may be presented in the following way.

High — the child understands and accepts the task and finds the pictogram named independently.

Medium — the child accepts the task but can hardly find the pictogram named; help in the form of correlation of the symbolic image with the realistic one makes it easier to find the pictogram named.

Low — the child does not understand or accept the task; points at the pictograms named at random; help in the form of correlation of the symbolic image with the realistic one does not make it easier to find the pictogram named.

1.4. Study of the skill of spontaneous recognition of symbolic images

Research procedure. The child is shown symbolic images (pictograms) one after another and is asked to name the one chosen by the teacher-logopedist.

Instruction: “Please, tell us what/who it is. What is ... doing?”

Stimulus material. Pictographic images – three pictograms – from each block (other pictograms from each block can be chosen): *toys, doll, ball* [12]; *horse, dog, cockerel* [6]; *wood, apple, carrot* [11].

Possible *assessment levels*.

High — the child understands and accepts the task; independently names the pictographic images shown to them with the help of accessible means (vocalization, sound imitation, syllable, word, pseudo word).

Medium — the child accepts the task but finds it difficult to name the pictographic image shown to them with the help of accessible means; needs active help of the teacher-logopedist (in the form of correlation of the symbolic image with the realistic one or naming the first one or two syllables of the word); help is effective.

Low — the child does not understand or accept the task; takes up the pictograms presented at random; help in the form of correlation of the symbolic image with the realis-

tic one or naming the first one or two syllables of the word is not effective.

1.5. Study of the skill of controlled interpretation of a sequence of symbolic images

Research procedure: The child is shown a sequence of symbolic images united by common meaning and is asked to point at the one named by the teacher-logopedist. If the child finds it difficult, a training task is completed.

Instruction: “Please, show us where...”

Stimulus material: series of three symbolic images – pictograms – united by common meaning: *a girl is having tea* [7]; *a boy is watering flowers* [11]; *a girl is sweeping the kitchen floor* [8].

Assessment level can be the following.

High — the child understands and accepts the task; understands the common meaning of the sequence of symbolic images; points at the image named by the teacher-logopedist independently.

Medium — the child accepts the task but finds it difficult to complete it, needs training, help is effective.

Low — the child does not accept the task; does not understand the common meaning of the sequence of symbolic images; understands each image separately and points at

it; help in the form of training is not effective.

1.6. Study of the skill of spontaneous interpretation of a sequence of symbolic images

Research procedure: The child is shown a sequence of symbolic images united by common meaning and is asked to name the one chosen by the teacher-logopedist. In case of difficulty, a training task is completed.

Instruction: “Please, tell us who it is. What is/are ... doing?”

Stimulus material: series of three symbolic images – pictograms – united by common meaning: *a boy is drawing a picture* [9]; *a girl is picking up mushrooms* [11]; *children are singing a song* [9].

Assessment level can be the following.

High — the child understands and accepts the task; understands the common meaning of the sequence of symbolic images; describes the sequence presented with the help of a sentence.

Medium — the child accepts the task but finds it difficult to perform it, makes up a phrase but not a sentence (*eto mal'chik, eto devochka, eto deti*); needs help of the teacher-logopedist in the form of a training task; help is effective.

Low — the child does not accept the task; does not understand the common meaning of the sequence of symbolic images; understands

each image separately; enumerates separate pictograms even after completion of a training task; help in the form of one training session is not effective.

1.7. Study of the skills of perception and recognition of abstract spatial or combined signs (feasibility of inclusion in research is determined by the children's age and the educational program requirements)

Research procedure: The child is asked to look at graphic images of monosemantic signs with unique meaning, and to point at it and name it.

Instruction: "Please, show us ..." "Please, tell us what it is".

Stimulus material: = — "equal to"; + — "add"; - — "subtract"; road signs: "Pedestrian crossing", "Traffic lights ahead", "Children crossing".

Assessment levels can be represented in the following way.

High — the child understands the meaning of the sign presented, independently points at it and names it correctly.

Medium — the child has problems with understanding the meaning of the sign and with naming it; needs help of the teacher-logopedist; help is effective.

Low — the child does not understand the meaning of the signs presented; does not point at them or name them; help is not effective.

2. Research of methods/means of graphic expression and symbolic images operation techniques

2.1. Study of graphic expression means

In the course of the study we try to figure out what instrument will be best for the child to demonstrate graphic expression skills: pencil, marker, felt pen, or finger. With this end in view, the child is asked to draw lines on a sheet of paper using various instruments.

2.2. Study of symbolic images operation techniques

Before introduction of graphic symbols and practicing their usage, it should be determined what symbol operation techniques are used by the child: they point at the symbol with the index finger/hand; touch it; take out from the set of symbols (communicative diary, communicative board); in case of technical devices – push a certain button or key; change the direction of their gaze.

3. Research of skills of graphic information transfer

3.1. Study of the skill to reproduce graphic model

Research procedure: the child is asked to reproduce the graphic model using the most convenient method or instrument.

Instruction: "Draw the same, please".

Stimulus material: pencil, marker, felt pen; graphic model: eyes, mouth.

The following *assessment levels* are possible.

High — the child understands and accepts the task; performs the task independently trying to copy the model as best they can.

Medium — the child accepts the task, but finds it difficult to complete it, cannot reproduce the graphic model though tries to use the most convenient method or instrument; needs help of the teacher-logopedist in the form of a training task; help is effective.

Low — the child does not accept the task; does not understand the common meaning of the sequence of actions; help in the form of a training task is not effective.

3.2. Study of the skill to reproduce images and abstract signs

Research procedure: the child is asked to draw a picture on the model, to draw an abstract sign.

Instruction: “Draw the same, please”.

Stimulus material: pencil, marker, felt pen; pictures: *house, man, ball*; abstract signs: *square, broken line*.

Assessment level can be the following.

High — the child understands and accepts the task; performs the task independently trying to copy the model as best they can.

Medium — the child accepts the task, but finds it difficult to complete it, cannot reproduce the picture though tries to use the most convenient method or instrument; needs help of the teacher-logopedist in the form of a training session; help is effective.

Low — the child does not accept the task; does not understand the common meaning of the sequence of actions; help in the form of a training session is not effective.

3.3. Study of the skills to transfer/express meaning with the help of graphic symbols of words:

a) with the help of a realistic image;

b) with the help of the word given by the teacher-logopedist.

Research procedure:

a) the child is shown a realistic image (picture) and asked to find the graphic symbol corresponding to it;

b) the teacher-logopedist gives a word and asks the child to find the graphic symbol corresponding to it.

Instruction:

a) “Please, find the picture with ...”.

b) “Give me ..., please”.

Stimulus material. Any set of pictures and corresponding pictograms can be chosen [6; 7; 8; 9; 10; 11; 12], for example: pictures – *doll, cup, apple, is sleeping, is playing, is eating* and the corresponding pictograms; words: *horse, girl, doll, eat, draw, sleep* and the corresponding pictograms.

Assessment level can be the following.

High — the child finds graphic symbols for all suggested pictures and words on their own.

Medium — the child finds graphic symbols for the majority of realistic images; has considerable problems with finding graphic symbols for the suggested words; help of the teacher-logopedist is effective.

Low — the child can find the necessary graphic symbol in a few cases; cannot find them for the suggested words, help is not effective.

3.4. Study of the skills to construct utterances with the help of sequence of graphic symbols:

- a) with the help of a series of realistic images;
- b) with the help of a sentence given by the teacher-logopedist.

Research procedure:

- a) the child is shown a sequence of three pictures and asked to pick up and place the graphic symbols in the same sequence;
- b) the teacher-logopedist reads a sentence and asks the child to pick up and place the graphic symbols to construct the given sentence.

Instruction:

- a) “Please, look at the pictures. Build up what you see with the help of the pictures”;
- b) “Build up what I said with the help of your pictures”.

Stimulus material (you can choose any set of pictures and the

corresponding pictograms [5; 6; 7; 8; 9; 10; 11; 12]):

– *A boy is reading a book*; pictograms: *boy, draw, book* [9]; *A girl is picking up mushrooms*; pictograms: *girl, pick up, mushroom* [11]; *An old woman is watching TV*; pictograms: *old woman, watch, TV* [7];

– sentences: *A boy is picking a pear*; pictograms: *boy, pick, pear* [11]; *A girl is dressing a doll*; pictograms: *girl, dress, doll* [12].

Assessment levels can be the following.

High — the child understands and accepts the task and performs the task with a little help from the teacher-logopedist.

Medium — the child understands and accepts the task; completes the first variant of the task with insignificant help; finds it difficult to perform the second variant of the task; needs a training session; help of the logopedist is effective.

Low — the child does not understand or accept the task; cannot perform the task even after a training session; help is not effective.

3.5. Study of the skills to construct a short text with the help of sequence of graphic symbols:

- a) with the help of a series of plot-driven pictures;
- b) with the help of sentences given by the teacher-logopedist;
- c) independently.

Research procedure: the child is shown a series of three plot-driven pictures, united by the common

plot, and asked to relate the content of the plot with the help of graphic symbols; the teacher-logopedist reads out three sentences, united by the common plot, one after another and asks the child to relate the content of the text with the help of graphic symbols; the child is asked to make up a short text with the help of a sequence of graphic symbols independently.

Instruction: “Look at the pictures. With these pictures, make up a short story which would correspond to what is drawn in the pictures”; “Listen attentively. I am going to tell you a short story. Make it up with your pictures”; “Look at your pictures and make up your story based on them”.

Stimulus material: a series of plot-driven pictures; pictograms [5; 6; 7; 8; 9; 10; 11; 12].

Assessment levels can be the following.

High — the child understands and accepts the task; lays out symbolic images in correspondence with the given sequence of plot-driven pictures; finds it difficult to choose pictograms and determine the order in which they should be placed according to the verbal model, needs help in this case; independent task completion is possible only after a training session, help is effective.

Medium — the child accepts the task; performs only the first variant and only with the help of the teach-

er-logopedist; cannot complete the second and the third variants even after a training session.

Low — the child does not understand or accept the task; cannot perform the task even after a training session; help is not effective.

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