

# Development of Multi-Textured Therapeutic Toys for Development of Tactile Perception of Children from 2 to 7 Years Old



E. P. Dragunova, Yu. A. Boyko

**Abstract:** *This article considers the importance of usage of multi-textured toys made in different materials and analyzes the possibility of their use to overcome the problems of psycho-speech development and speech education of children from 2 to 7 years old.*

**Keywords :** *tactile perception, sensory capabilities, cognitive processes, toys for speech therapists.*

## I. INTRODUCTION

In today's world of information overload, logopedic problems have become massive. Their growth is largely caused by children's early mastery of modern digital devices, because of active use of which there is a shift in the development of the child from role-playing games with peers or within the family, to one-way communication with a computer, tablet, smartphone, etc. These factors do not contribute to the timely psychoretic development of children and can cause the development of sensory and motor deprivation and cause problems of alienation.

One of the main tasks facing specialists working with young children is the restoration and development of tactile-motor sensations of the child. Tactile sensations helps the child to explore the world around him and to properly sense objects realizing their size, elasticity and fluidity, softness and stiffness, smoothness and roughness, etc. [1]. Sensory perception affects not only the general, physical and mental state, but also the speech development, so toys from different materials with fillers are actively used in the work of both psychologists, motor therapists, and logopedists - defectologists. Development and strengthening of tactile perception of objects is very important for children both healthy and having problems causing difficulties in recognition of objects (in terms of size, ratio and configuration of parts, etc.) [ 2, 3]. For children with visual impairment, tactile sensitivity is compensatory, allowing

better orientation in space and the most complete representation of surrounding objects.

In the case of hearing disorders, as in the case of psycho-speech delay, the formation of skin sensitivity, which complements the rest of the senses, contributes to the development of sensory integration, which directly affects the child's mastery of oral speech.

Since the first impressions about the world child get through the process of game, main sources of knowledge for him are toys. At an early age, when child have *visual operatory thinking*, he/she needs sense tactilely both the shape and the surface of the object to obtain complete image of the object. Even when the child is able to name the object correctly, he or she needs to have a clear memory of the sensations of touching a surface. The ability to tactilely determine an object without the use of vision is developed by combining information received through all senses [4]-[7].

Each specialist is faced with problem of finding the necessary toys and animal figurines which meets the requirements of game therapy, that they can use in their practice. Logopedists – defectologists and child psychologists are constantly in search of the most effective educational materials, multifunctionality of which is not just desirable, but a necessary condition for implementing the principle of universality. The development of universal toy's collections, which at the same time are therapeutic material in the hand of a specialist, should be based on the principles of universal design with the use of innovative technologies. Their purpose is to help psycho-speech development of young children and to facilitate the process of teaching oral speech of visually impaired and hearing-impaired children, as well as children with speech development disorders. The need for such collections is due to the fact that most of the therapy is based on a comparison of sensations obtained from different textural surfaces, which implies a greater variability of the materials used. In serial production of toys, it is technically impossible to use all necessary textures, therefore we offer to manufacture similar collections in small batches. Materials when touched should elicit specific associations with the image of the subject that will be fixed in the child's mind. Individual toys of various manufacturers can be found on the market, but assembling the kit that necessary for therapy (which meets the requirements of completeness, size, surface texture, etc.) will take a lot of time. The surface of the toy should give the child clear associations with the selected animal, so tactilely all toys (animals, reptiles or birds) should be different both in shape and texture of surface.

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\* Correspondence Author

**Ev. P. Dragunova\***, MIREA – Russian Technological University, Moscow, Russia. Email: dragunovaart@mail.ru

**Yu. A. Boyko**, MIREA – Russian technological University, Moscow, Russia. Email: bojko2007@yandex.ru

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## II. PROPOSED METHODOLOGY

For manufacturing toys can be used natural and synthetic materials which can be combined with each other to achieve different surface texture:

- artificial and natural fur (*rabbit*, sheep);
- skin and leather (natural and artificial);
- feathers, fluff;
- plastic (polyethylene, polypropylene, polyurethane foam);
- rubber, silicone;
- wood, bark, hay, straw;
- fabric (velvet, velour, tweed, plush, flannel), felt;
- threads (cotton, silk, wool);

Also toys can be knitted, wallowed or made of threads, hay, straw.

Collections can be divided into series including sets of wild and domestic animals, wild and domestic birds, reptiles, amphibians and insects. An additional «Family» series can be made for each of the above series.

For children of age group from 2 to 4 years old it is proposed to use animal figurines of recognizable generalized shape of small size up to 5 cm, helping to remember and learn to recognize the basic shape of the animal, the ratios of body parts and texture of surface whether it smooth, fluffy, soft, hard, rough, flake, etc., and understand that animals may have four limbs, wings, a long nose, large ears, long fangs, etc.

For the next age group of 5 to 7 years, animal figurines must be more detailed and have a different surface texture that mimics different parts of the animal body (nose, eyes, hoof, horn, tail, body). The size of such toys should be 10-15 cm. Each figurine can combine several types of materials, which will allow the child to most accurately identify the animal to the touch.

Small children get acquainted with animal forms and incorporates them into their vocabulary, and from the age of 5 while learning examination techniques they already know that nose, horns and tail are tactilely different and can identify it on each figurine and correlate their texture and size to each other.

This research analyzed and presented animals that are popular among specialists, divided them into groups: wild (animals, birds), domestic (animals, birds), reptiles, amphibians and insects for different age categories. For elder children, the number of toys is reduced, but their detail is increased.

Therapeutic work with toys has several sequential stages that depends on age, problem intensity and set tasks. The work always begins with physical and visual acquaintance with toy, which makes it possible to link together sensations obtained through fingers and visual perception of objects. Toys are examined visually and tactilely and child record sensations that they have from wool or skin of the animal, whether it has horns or not, smooth them or rough, sharp or rounded, etc.

Wild animals: lion, tiger, lynx, elephant, behemoth, rhino, camel, monkey, zebra, bear, wolf, fox, elk, deer, beaver, hare, squirrel, bat, rat, mouse.

Pets: horse, bull, cow, calf, ram, sheep, lamb, goat, goat, kid, cat, dog, rabbit.

Wild birds: ostrich, pelican, flamingo, peacock, swan,

crane, heron, stork, owl, pigeon, crow, blue tit, sparrow.

Poultry: rooster, chicken, chicken, duck, goose, turkey, parrot.

Reptiles: crocodile, turtle, snake, lizard.

Amphibians: toad, frog.

Insects: butterfly, dragonfly, ant, spider, blacksmith, bee.

This stage of image recognition and memorization not only develops tactile sensitivity of fingers, but also helps to form subject practical activity, increases vocabulary contributing to speech formation.

After the child has started to recognize the objects and can pick the named toy, the tasks become more complicated - toys are placed in a closed bag or box and child pick the toys tactilely without using visual perception. It is one of the most effective exercises, helping in the development of the speech apparatus because the active use of tactile-motor sensations directly affects the child's mastery of speech.

The next stage is the complication of the task, which is also performed without visual assistance - it is the search for figurines by families (a male goat and a female goat - goatling; a bull and a cow - a calf; a male cat and a female cat - a kitten, etc.) As in the previous task figurines can be folded both in a box and in a bag, it is important that the child finds the right toy based on his tactile sensations, fixed by prior familiarity with this toy. The figurines in the bag can be felt through both fabric and direct contact.

## III. RESULT

As a result of the analysis, it was determined and recommended for children from 2 to 4 years to use animal figures of small size up to 5 cm of generalized shape. For older children from 5 to 7 years old, the size of toys should be 10-15 cm, they should be more detailed and have a multi-finished surface that combines more materials.

## IV. CONCLUSION

This article proposes to develop a series of toys for children from 2 to 7 years old, which could be used as therapeutic material by specialists working with normal children and children with visual, hearing or speech disabilities.

The versatility of such toys facilitates the process of teaching speech, reading and can serve as a prevention in the delay of speech development and dyslexia. The kits can be used both by parents in the home game and by specialists in institutions and clinicians within the hospital. An important role in the creation of such toys is played by the design and selection of materials having a characteristic texture capable of causing associative recognition of certain objects.

## REFERENCES

1. Mazayeva E.G. Use of tactile boards in the work of a teacher-logopedic with children of 5-7 years of age having visual disorders//Pedagogy, traditions and innovations: materials of the III International Scientific Conference. - Chelyabinsk. 2013. [Electronic Resource]. - Access mode: <http://www.moluch.ru/conf/ped/archive/69/3711> (date of appeal 28.10.2019)

2. Lemberg T. A. Organization of corrective work to prevent dyslexia in children of older pre-school age. [Electronic resource]. - Access mode: [https://www.defectologiya.pro/personal/articles/organizacziya\\_korrekcziionnoj\\_raboty\\_i\\_po\\_preduprezhdeniyu\\_disleksii\\_u\\_detej\\_starshego\\_do\\_shkolnogo\\_vozrasta/](https://www.defectologiya.pro/personal/articles/organizacziya_korrekcziionnoj_raboty_i_po_preduprezhdeniyu_disleksii_u_detej_starshego_do_shkolnogo_vozrasta/) (date of appeal 28.10.2019)
3. Shilov E.A., Khodyakov A.S. Development of coherent descriptive speech of pre-school children with severe speech disorders using products of decorative and applied creativity//Current problems of defectology and clinical psychology: Theory and practice: collection of scientific works of the XIII International Scientific and Educational Conference (Kazan, 2019. 13. - [Electronic resource]. - Access mode: [https://kpfu.ru/portal/docs/F835020472/Sbornik.\\_konferencii.\\_Aktualnye\\_problemy\\_defektologii\\_i\\_klinicheskoy\\_psikhologii](https://kpfu.ru/portal/docs/F835020472/Sbornik._konferencii._Aktualnye_problemy_defektologii_i_klinicheskoy_psikhologii). (date of the address 28.10.2019).
4. Sokolova M.L. Modern problems of the direction "Technology of artistic processing of materials" // Russian Technological Journal. - 2017. - V. 5, No. 1 (15) - pp.50-56.
5. Kornilov I.G. Game and creativity in the development of communication of senior pre-school children with visual impairment. Creative game-drama/I.G. Kornilov. - Moscow: Publishing House "Exam, 2004G. O. Young, "Synthetic structure of industrial plastics (Book style with paper title and editor)," in *Plastics*, 2nd ed. vol. 3, J. Peters, Ed. New York: McGraw-Hill, 1964, pp. 15-64.
6. Dryukova, A.E. Principles of universal design on the example of assistive devices for specific groups of invalids // International Journal of Engineering and Technology(UAE) - Volume 7, Issue 4.25 Special Issue 25, 2018, pp. 221-222.
7. Kazachkova O.A., Kulishova E.A., Kukushkina V.A., Abdullah L.S. CREATIVITY-BASED INTEGRATION PEOPLE WITH LIMITED OPPORTUNITY ON THE EXAMPLE OF CREATING ARTISTIC PRODUCTS OF METAL CLAY International Transaction Journal of Engineering, Management, & Applied Sciences & Technologies. Volume 10 No.3 -2019. - pp. 345-350.

International and all-Russian Scientific conferences and is the author of more than 60 scientific articles.

## AUTHORS PROFILE



**Ev. P. Dragunova**, Senior lecturer of Department of Computer Design, Institute of Physics and Technology, MIREA – Russian technological University, Moscow, Russia. Lives and works in Moscow. Member of the Creative Union of Artists of Russia in the section of icon painting. **Evgenia Petrovna** studied at the Saransk Art

College at the Department of Academic Painting. She graduated from the Department of Computer Design at Moscow State Academy of Engineering and Computer Science, specialty «Technology of artistic processing of materials». She was retrained at the Interregional Academy of Construction and Industrial Complex under the program "teacher of fine arts."

The author of more than 15 articles. Developer of an adapted program of academic painting for designers. For more than thirty years she has been an icon painter at the Russian Orthodox Church in collaboration with the icon painting workshop "Stratiles".

For more than twenty years, she has been developing multi-firing equipment for academic painting on porcelain. His research interests include the features of color perception of modern artistic paints, the study of the artistic features of new colorful materials, the restoration of old masters' art techniques in tempera and oil painting techniques, the search for new techniques in the technique of overglaze multi-firing painting on porcelain.



**Yu.A. Boyko**, PhD in Technology, Associate professor of Department of Computer Design, Institute of Physics and Technology, MIREA – Russian technological University, Moscow, Russia. Yuliya Alekseevna Boyko graduated with honors from Moscow State Academy of Engineering and Computer Science, specialty «Technology of artistic processing of materials» - majoring in «engineer-artist». She defended her dissertation on the specialty 17.00.06 - "Technical aesthetics and design", with the assignment of the degree of candidate of technical Sciences and began teaching at the Department of computer design. During her teaching career, she conducts all types of training sessions in the main educational programs of bachelor's and master's degrees: lectures, practical classes, laboratory work, course design, taking credits and exams for courses and preparing graduates.

Research interests include: modern methods of manufacturing and decorating ceramic and glass products, search for new ways of decorating ceramics and glass materials, research of artistic features of new colorful materials, search for new techniques in the technique of multi-glaze painting on porcelain. She is the author of 6 tutorials and textbooks on the manufacture and decoration of ceramic products, constantly participates in