Influence of Child's Individual Experience on Motor Activity Skill Development during the Preschool Period

Valentina V. Grebneva[1], Marina V. Sadovski*[2], Alexey Yu. Kovtunenko[3]

[1] Faculty of Psychology of NRU "BelSU," Belgorod State University, Belgorod, 85, Pobedy Street, Russia.
grebneva@bsu.edu.ru
[23] Faculty Preschool and Special (defektologichesky) Education of NRU "BelSU" Belgorod State University, Belgorod, 85, Pobedy Street, Russia.
sadovski@bsu.edu.ru
kovtunenko@bsu.edu.ru
*Corresponding Author

https://doi.org/10.24191/ajue.v17i1.12610

Received: 29 December 2020
Accepted: 8 February 2021
Date Published Online:8 March 2021
Published: 8 March 2021

Abstract: The advent of technology has overshadowed children's leisure time and deprived them of the opportunity for physical activity. The main target of the current study is to discuss about the methodology of individualized diagnostics of motor activity peculiarities among children during the preschool period. The aspect of physical activity development is of federal importance. The research problem is presented as a search for pedagogical possibilities to optimize the motor activity of a growing person during preschool age. The characteristics of a child's motor activity and transformation factors are described when deviating from the age norm, both in the negative and in the positive direction. In the course of the study, the results were obtained that testify to the high efficiency of diagnostic techniques aimed at identifying the features of the motor activity of children in different types of preschool educational institutions. Distribution of the sample according to the behavioral characteristics of motor activity is possible; according to the profile of the main needs of the subjects and the emotional attitudes of preschoolers to different types of physical activity using color choices.

Keywords: Instinct profile, Need, Physical activity, Preschool age

1. Introduction

Today, children are the main victims of the age of technology. The advent of technology, the Internet and computer games has overshadowed children's leisure time and deprived them of the opportunity to engage in physical activity. The importance of physical activity for children is very significant. Only in childhood, puberty and early adolescence is there a good time and opportunity to form a fit body through games and interactive communication (Erickson, Hillman & Kramer, 2015; Abd Malek & Mohamed, 2017). The physiological and psychological aspects of exercise empower children to accept adult stress and work-related limitations. The initial negligence in creating correct and appropriate activities leads to mental and physical injuries and endangers the child's health. Sports activities should be an integral part of the growth and development of children and adolescents. In early life, especially in childhood and adolescence, sports activities play an important role in the physical, mental and mental development of the child (Gunnell, Poitras, LeBlanc, Schibli, Barbeau, Hedayati, & Tremblay, 2019). More importantly, the emphasis on informal play is a prerequisite for the child, as an opportunity to gain experience in a variety of sports activities, leading to the development of a range of motor skills necessary to participate in future sports activities (Zakaria & Abdul Halim, 2017; Valkenborghs, Noetel, Hillman, Nilsson, Smith, Ortega & Lubans, 2019). Contrary to popular belief

that obesity, cardiovascular disease, type 2 diabetes, and osteoporosis are commonly known as adult health problems, they all have their roots in childhood. Adequate exercise, along with a healthy diet, offers lower-cost options for preventing and managing long-term illness in adolescents. Exercise to keep young people healthy includes preventing weight gain and obesity, developing skeletal health, increasing heart and lung function, and improving their mental health. The ideal program for all adolescents can be to establish and establish healthy exercise during adolescence and to follow a regular presence in physical activity during adulthood (Muhamad & Kuan, 2020).

The relationship between physical activity and obesity in young obese people is not completely clear and studies related to it do not provide consistent results to experts. However, you can lose weight by increasing your weight and mobility as well as reducing your calorie intake. Concerns about weight gain among children and adolescents are perfectly reasonable. Obese children are at risk for high blood pressure, type 2 diabetes, growth hormone disorders, and respiratory and bone problems. These patients suffer from a lack of self-confidence and social relationships. Often, cardiovascular disease occurs in adults, although it can occur at an early age. Research shows that aerobic exercise is very effective in preventing adult cardiovascular disease, but it is still unclear in children. Exercise has a lasting effect on bone growth and development. Physical activity reduces the risk of osteoporosis by increasing the concentration of minerals. Research on 40 adult boys who exercised for 30 minutes three times a week found that their back and leg bones had twice the volume and mineral concentration in their bodies as those who were less active (Martin, Bremner, Salmon, Rosenberg & Giles-Corti, 2012; Logan, Raine, Drollette, Castelli, Khan, Kramer & Hillman, 2020).

Modern scientists, whose attention is focused on the features of the relationship between the psyche and the body, note that the way a person holds himself, how he looks, how he sits, stands, moves, how the body reacts to different situations are conditioned by his past stories, individual childhood experience (Aamodt & Wang, 2011; Bailey, 2019; Johnson, 2013; Dower, 2016; Glannon, 2007). Bodynamic researchers note that our body remembers everything that we have ever experienced. A person can independently regulate his state and emotions by working with the body, being aware of it, studying the language of body impulses (Young, 2008; Muscatell, 2020; Palmer & Palmer, 2002; Shanon, 2008). At the same time, at an early age, nature itself is the best mentor for gaining bodily experience and developing the human psyche. For higher achievements, it is necessary to develop specially organized actions to stimulate brain activity through movement. In this regard, we are actively searching for and developing effective and simple methods for diagnosing a child's motor experience, as well as the ways of its development, despite the fact that the system-forming role of corporality in the formation of a preschooler's motor activity, individual needs, and emotional experience of play activity are also significant factors for this process (Baardseth, Goldberg, Pace, Wislocki, Frost, Siddiqui & Minami, 2013).

On the basis of scientific publication analysis, development and testing diagnostic techniques and the methods for the development of individual characteristics are necessary for the formation of physical activity among preschool children. For this reason, in the current study, as a novel strategy, it was tried to discuss the methodology of individualized diagnostics of motor activity peculiarities among children during the preschool period.

2. Material and methods

Diagnosis of psychological and behavioral characteristics of a preschool child is most often carried out using the observation method, the questionnaires of a child, or his parents. The most effective method for studying the characteristics of a growing person is the observation method. To identify the features of the child's motor activity, we used a protocol based on the methodology for diagnosing motor disinhibition of preschoolers under seven years old, developed by American scientists Mary Alvord and Patricia Baker (Alvord, Baker & Associates, www.alvordbaker.com/resources) (www.alvordbaker.com). Unlike the authors of the method, we consider the signs given in the table as a child's motor activity, the deformation of which occurs during deviation from the norm in one direction or another (Grebneva & Sadovski, 2020) (Table 1).

It should be noted that the current study is an experimental one. The method proposed and tested by us to study the individual characteristics of children's motor activity was on a sample of 5-6 years old (285 people). Also, it should be mentioned that to identify the emotional attitudes of children to different types of physical activity, we used the diagnostic methodology, the color test of attitudes by A.M. Etkind, adapted by us for use during preschool age (Prinz, 2005).

Table 1. Approximate form of the protocol for monitoring the child's physical activity (sample)

#	Runs more often than walks			Climbs on furniture, desks, shelves			Fidgety (dodges, jumps, sways)			Does everything with noise (drops, stumbles, turns over)			Plays all the time and involves others		
	often	always	sometimes	often	always	sometimes	often	always	sometimes	often	always	sometimes	often	always	sometimes
1	x			x				x			x			x	
2			x				x			x			x		
3	x				x			x			x				x
4				x				x			x			x	
5															
6	x					x			x			x			x

Instructions for drawing up. Note the presence of the symptom in a child. Turn the marked options into points, according to the following instruction: “Always” - hyperactivity (3 points, increased); “Often” - average activity (2 points, normal); “Sometimes” - hypoactivity (1 point, reduced).

Calculation and interpretation of results. Calculate the average score for each number (divide the number of points received by the number of features (in our case, their number is 5).*

*Note. If you wish or need, you can expand the list of signs or replace them with others.

Based on this protocol, the sample of subjects can be divided into three groups, respectively:

Group 1 - sedentary children with reduced motor activity are inactive, keep apart, choose passive games, prefer passive observation of peers' activities to their own participation in it. Such children are shy, indecisive, often cry, and take offense. Decreased motor functions can lead to mental retardation among these children (1 point).

Group 2 - children with normal (average) motor activity, balanced, cheerful, and benevolent, participate in joint activities with interest, have formed voluntary behavior and attention (2 points).

Group 3 - hyperactive children (increased physical activity), characterized by a lack of experience of "playing by the rules," the predominance of involuntary attention, impulsive, do not know how to reckon with their peers, which often leads to conflicts. They are characterized by outbursts of aggression and anger. They love to play war games. They are prone to trauma (3 points).

The innate reference points that form the system of individual needs and motives, attitudes, interests, as well as behavioral stereotypes are instincts, which we consider as fundamental, evolutionarily selected, and genetically fixed basic life needs. It will not be difficult for a teacher or an educator to construct a profile of instincts using a projective diagnostic map developed by V. Frankl in accordance with our modified instructions. “Layout the pictures in front of the child in accordance with the indicated number on the backside (here, the number is indicated on the front side conventionally). Invite your child to choose the most beautiful icon and flip it over. Then choose one more from the rest ... and so on until you get the pictures with numbers in front of you (for example, 5 7 3 6 2 4 1). A set of numbers will indicate the individual characteristics of the instinct profile of each child, which you can interpret by referring to the primary source (Frankl, 2005).

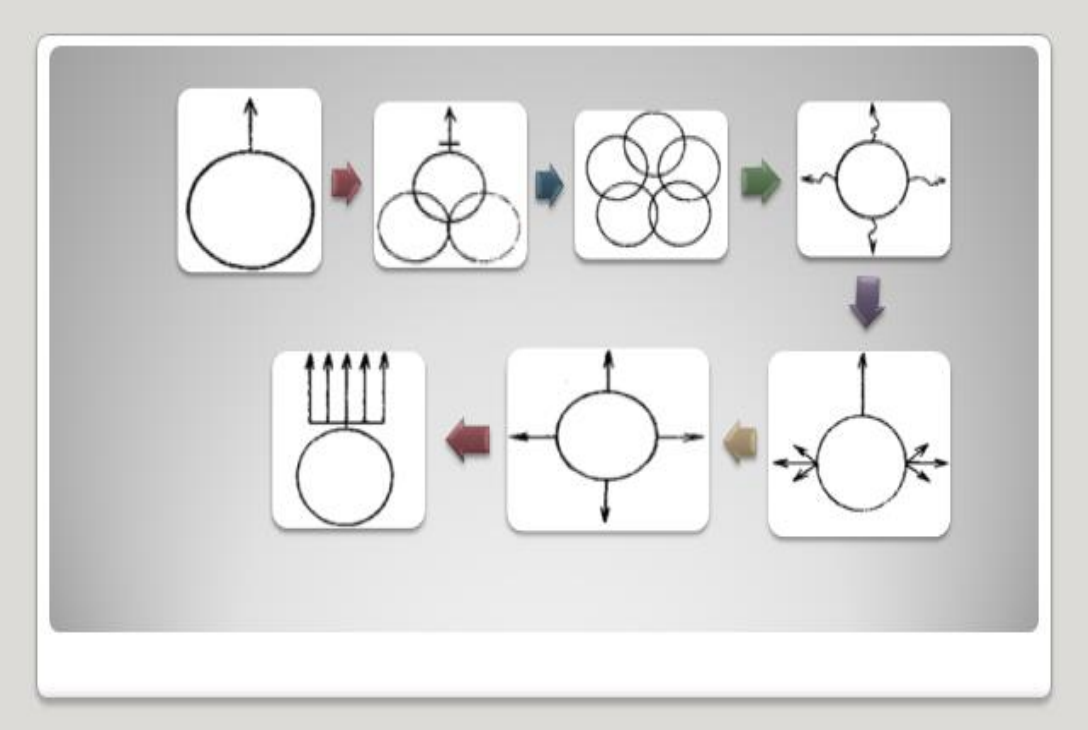

Fig. 1 Working cards for the methodology of diagnostics in respect of leading instincts-needs ("Instinct-profile" by V. Frankl (2005)) *
*Note: basic life needs are arranged in order from 1 to 7: self-preservation (1) and procreation (2), altruistic (3), research needs (4), domination (5), freedom (6), preservation of dignity (7). For ease of use, the number of needs is indicated on the back of the card.

The needs profile consists of the feminine (self-preservation and procreation) and masculine (exploration, domination, freedom, and preservation of dignity) characteristics. A person who gives preference to needs 1 and 2 is feminine, 4-5 - masculine. Each child has an individual instinct profile, which should be taken into account during the development of motives for motor activity. For example, the dominance of the feminine group of needs (1 and 2) can cause the formation of motivation for failure avoidance, while masculine (4-7) needs will contribute to the development of motivation achievement. Altruistic needs are intermediate; their main function is to "reconcile" two groups.

3. Results

The pupils of preschool educational institutions with different systems of physical education took part in the study:

Group No. 1 - the pupils of preschool educational institutions with a standard system of physical education in accordance with the federal state educational standard for preschool educational institutions.

Group No. 2 - the pupils of the preschool educational institution implementing the program of Physical development and healthcare of preschoolers in educational institutions. The goal of the program is to preserve and improve the health of pupils, to form their values for health, a healthy lifestyle, and the choice of educational technologies that are age-appropriate, eliminate overload, and preserve their health.

Group No. 3 - the pupils of preschool educational institutions, the participants of the program (innovation platform) "Formation of social competence of preschoolers in the field of physical culture and health-improving activities on the basis of game projects." This group is characterized by a versatile organization of physical culture and recreation activities, the creation and implementation of a program for the physical development of children.

Table 2 shows the results of the study of the dominant instincts among the pupils of preschool educational institutions undergoing a different system of physical training.

Table 2. Dominant instinct in groups of children with different physical education systems, av. Score

Instinct	Groups		
	№1	№2	№3
Self-preservation	3,95±1,91	4,38±2,27	4,58±1,5
Birth instinct	3,6±1,74	4,07±1,85	2,67±1,37*
Altruistic	2,62±2,09	3,1±2,21	2,5±2,11
Research	5,24±1,53	4,45±1,52*	4,92±2,15
Dominance	3,98±2,24	3,52±2,12	3,58±2,15
Freedom	4,5±1,85	4,6±1,78	4,5±1,5
Preservation of dignity	4,12±1,7	3,76±1,87	4,67±1,87

Note: significant changes as compared to the control group (gr. №1). * - at P<0,05; ** - P<0,01; *** - P<0,001.

The processing of the results obtained was carried out according to a point system. The following gradation was developed for a qualitative assessment of the results:

1 - 3 points - the instinct is expressed in a high degree;

4 - 5 points - the instinct is expressed in an average degree;

6 - 7 points - the instinct is expressed at a low degree.

The analysis of the obtained results showed that the children of group No. 1, undergoing training at a preschool educational institution with a standard system of physical education, have the following most pronounced instincts: altruism, procreation, self-preservation, and domination, average degree instincts: the instincts of freedom and preservation of dignity, these pupils are characterized by a research instinct to the least degree. The pupils of preschool educational institutions with a special program of physical education aimed at health preservation and strengthening (group No. 2) demonstrated the prevailing instincts of altruistic dominance and preservation of dignity, average degree instincts: procreation, self-preservation, research, and freedom. The preschoolers of the group No. 3 undergoing the training under the program of versatile organization of physical culture and recreation activities demonstrated the three most important instincts: altruism, procreation, and domination; the instincts of self-preservation, research, freedom, and preservation of dignity are presented in an average degree. It is important to note that the children undergoing training in specialized physical training programs demonstrated the expression of all instincts to a high and medium degree. A low level is absent for all studied characteristics, which may indicate the diversified development of the motivational aspect and the sphere needs among the pupils of the group № 2-3.

4. Discussion

Statistical processing of the data obtained showed that there are significant differences in the severity of the following instincts in control (group No. 1) and experimental groups (group No. 2-3). Namely, the procreation instinct is significantly more pronounced among the pupils of group No. 3, the research instinct - among the pupils of the group №2.

To identify the emotional attitudes of children to different types of physical activity, we used the diagnostic methodology, the color test of attitudes by A.M. Etkind, adapted by us for use during preschool age (Prinz, 2005). The content of the modification consisted in the fact that the child was offered a picture with games that differed in the characteristics of motor activity (jumping, football, the arrangement of cubes, cycling, etc.). The child must choose the appropriate color for each picture (Tripp, French & Sherril, 1995; Chen & Hypnar, 2015).

Table No. 3 presents the color preferences among the children undergoing training in various physical education programs.

Table 3. Color preferences in groups of children with different physical education systems, av. Score

Color preferences	Groups		
	№1	№2	№3
Dark blue	3,9±1,88	4,6±2,37	2,92±1,31*
Green	4,26±2,15	4,64±2,09	4,33±1,3
Red	2,83±2,12	3,4±2,13	2,33±1,61
Yellow	3,53±1,86	3,9±1,12	3,08±1,73
Violet	3,6±1,81	4,79±2,43*	4,0±1,54
Brown	5,7±1,7	5,1±2,14	5,92±2,11
Black	6,52±1,85	5,12±2,41*	6±2,45
Gray	5,64±2,25	4,5±2,36*	7,25±0,62***

Note: significant changes as compared to the control group (gr. №1). * - at P<0,05; ** - P<0,01; *** - P<0,001.

Table 3 shows that among the children of the group No. 1, undergoing physical training according to the standard system of physical education, color preferences are distributed as follows: the level of high color preference includes red, yellow, violet, and blue. Green and brown - average color preference. Gray and black colors are the least preferred. Among the pupils of the preschool educational institution included in group No. 2, red and yellow colors evoke the greatest sympathy, then gray, blue, green, and purple colors, black and brown colors evoke low sympathy. In group № 3, color preferences are distributed as follows: high level of preference - blue, red, yellow, medium level - green and purple, low level - brown, black, and gray. Significant differences in color preferences were found for the following colors: blue, purple, black, and gray. Thus, the pupils of preschool educational institutions with a versatile system of physical culture and health-improving activities (group No. 3) give preference to blue to the greatest extent (as compared to the children of other groups), and gray is the most unattractive color for them. In group No. 2, the children undergoing health preservation and promotion programs have significantly higher acceptance of gray and black colors as compared to the pupils from other groups.

The author of the diagnostic technique for leading instincts, V. Frankl, showed that there is a certain relationship between color preferences and dominant instincts, namely the instinct of procreation and altruism is associated with blue, self-preservation - with green, exploratory and dominance - with red, and the instinct of freedom - with yellow. In our studies, it was found that there is a certain connection between color preferences and the severity of instincts, so in gr. No. 3, the preference for blue color is significantly higher, and the instincts of procreation and altruism among these children occupy a leading position.

5. Conclusions

In this paper, it was aimed to discuss about the methodology of individualized diagnostics of motor activity peculiarities among children during the preschool period. The aspect of physical activity development is of federal importance. This is due to the fact that recently there has been a general tendency towards the decrease of physical development indicators and health in general among the children of this category.

The methodology proposed and tested by us for the study of individual characteristics of motor activity of children on the sample of 5 - 6-year-old subjects (n = 285) confirms its effectiveness concerning the possibility of the sample distribution according to the following features: behavioral characteristics of motor activity; by individual typological properties of the nervous system; according to the profile of the basic needs among the subjects. Thus, we found that the features of the motor activity of children are conditioned by the properties of the nervous system, basic needs, as well as the type of educational environment of the preschool educational institution.

6. Acknowledgments

This article was supported by the RFBR grant # 19-013-00173.

7. References

Aamodt, S., & Wang, S. (2011). *Welcome to your child's brain: How the mind grows from conception to college*. Bloomsbury Publishing USA.

Abd Malek, M., & Mohamed, M. (2017). Physical activity level among women: Promoting sports and exercises across demographic determinants. *Asian Journal of University Education (AJUE), 13*(1), 79-92.

Bailey, R. (2020). Educating with Brain, Body and World Together. *Interchange* **51,** 277–291. https://doi.org/10.1007/s10780-020-09390-5

Baardseth, T. P., Goldberg, S. B., Pace, B. T., Wislocki, A. P., Frost, N. D., Siddiqui, J. R. & Minami, T. (2013). Cognitive-behavioral therapy versus other therapies: Redux. *Clinical psychology review*, *33*(3), 395-405.

Chen, W., & Hypnar, A. J. (2015). Elementary school students' self-determination in physical education and attitudes toward physical activity. *Journal of Teaching in Physical Education*, *34*(2), 189-209.

Dower, R. C. (2016). A brain-body balance. *Early Years Educator*, *18*(1), 18-20. DOI: 10.12968/eyed.2016.18.1.18.

Erickson, K. I., Hillman, C. H., & Kramer, A. F. (2015). Physical activity, brain, and cognition. *Current opinion in behavioral sciences*, *4*, 27-32.

Frankl, V. (2005). The Theory of Neuroses and Psychotherapy. In *On the Theory and Therapy of Mental Disorders* (pp. 85-88). Routledge.

Glannon, W. (2007). *Bioethics and the brain*. Oxford, England: Oxford University Press.

Grebneva, V.V., & Sadovski, M.V. (2020). K Probleme Razrabotki Metodiki Diagnostiki Individual'nykh Osobennostey Dvigatel'noy Aktivnosti Rastushchego Cheloveka [On the problem of the methodology development to diagnose individual characteristics of a growing person's motor activity] *Modern high technologies, 3(1),* 63-67 [In Russia].

Gunnell, K. E., Poitras, V. J., LeBlanc, A., Schibli, K., Barbeau, K., Hedayati, N. & Tremblay, M. S. (2019). Physical activity and brain structure, brain function, and cognition in children and youth: A systematic review of randomized controlled trials. *Mental Health and Physical Activity*, *16*, 105-127.

Johnson, M. (2013). *The body in the mind: The bodily basis of meaning, imagination, and reason*. Chicago, US: University of Chicago Press.

Logan, N. E., Raine, L. B., Drollette, E. S., Castelli, D. M., Khan, N. A., Kramer, A. F., & Hillman, C. H. (2020). The differential relationship of an afterschool physical activity intervention on brain function and cognition in children with obesity and their normal weight peers. *Pediatric Obesity*, e12708-12.

Martin, K., Bremner, A., Salmon, J., Rosenberg, M., & Giles-Corti, B. (2012). School and individual-level characteristics are associated with children's moderate to vigorous-intensity physical activity during school recess. *Australian and New Zealand journal of public health*, *36*(5), 469-477.

Muhamad, A. S., & Kuan, G. (2020, April). The Effects of Brain Breaks Physical Activity Solutions on Processes of Change in Physical Activity Among the Malaysian Primary School Children. In *Enhancing Health and Sports Performance by Design: Proceedings of the 2019 Movement, Health & Exercise (MoHE) and International Sports Science Conference (ISSC)* (p. 481). Springer Nature.

Muscatell, K. A. (2020, January). Brains, Bodies, and Social Hierarchies. In *Cerebrum: the Dana Forum on Brain Science* (Vol. 2020). Dana Foundation.

Palmer, J. A., & Palmer, L. K. (2002). *Evolutionary psychology: The ultimate origins of human behavior*. Massachusetts, United States: Allyn & Bacon.

Prinz, J. (2005). Are emotions feelings?. *Journal of consciousness studies*, *12*(8-9), 9-25.

Shanon, B. (2008). Mind-Body, Body-Mind: Two Distinct Problems. *Philosophical Psychology*, *21*(5), 697-701, DOI: 10.1080/09515080802415993

Tripp, A., French, R., & Sherrill, C. (1995). Contact theory and attitudes of children in physical education programs toward peers with disabilities. *Adapted physical activity quarterly*, *12(4)*, 323-332.

Valkenborghs, S. R., Noetel, M., Hillman, C. H., Nilsson, M., Smith, J. J., Ortega, F. B., & Lubans, D. R. (2019). The impact of physical activity on brain structure and function in youth: A systematic review. *Pediatrics*, *144(4)*, e20184032-39.

Young, C. (2008). The history and development of Body-Psychotherapy: The American legacy of Reich. *Body, Movement and Dance in Psychotherapy*, *3*(1), 5-18.

Zakaria, A., & Abdul Halim, N. H. (2017). Relationship between life satisfaction and academic achievement among trainee teachers. *Asian Journal of University Education (AJUE)*, *13*(1), 93-112.