The development of sensory-perceptual processes of the psyche in conditions of norm and organic pathology (CP)

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Abstract
The urgency of the problem of studying sensory-perceptual processes of the psyche is due to the need to find ways to stimulate the activity of children in modern conditions, as well as improving the diagnostics and correction of these processes in children with special needs as primary in the defect structure. The purpose of the article is to study theoretically and empirically the peculiarities of the development of sensory-perceptual processes of the psyche in the conditions of norm and organic pathology (cerebral palsy). A comparative analysis of sensory-perceptual processes development in organic brain damage has been performed on the basis of the consideration of the ontogenetic aspect of their study. It has been determined the way under the influence of these processes the effects of other levels of the psyche are formed, the way each of them changes and their interaction during the mental development of the psyche in conditions of norm and organic pathology (CP).

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Romanenko Oksana Viktorivna
Doctor of Psychological Sciences, National Academy of Internal Affairs, Ukraine
romanenkoks@gmail.com, ORCID 0000-0001-0104-0093

Romanenko Оксана Вікторівна
dоктор психологічних наук
Національна академія внутрішніх справ, Україна
romanenkoks@gmail.com, ORCID 0000-0001-0104-0093

Abstract
Актуальність проблеми вивчення сенсорно-перцептивних процесів психіки зумовлена необхідністю пошуку шляхів стимулювання активності дітей у сучасних умовах буття, а також удосконалення діагностики та корекції цих процесів у дітей з особливими потребами, як первинних у структурі дефекту. Мета статті полягає в теоретичному вивченні та емпіричному дослідженні особливостей розвитку сенсорно-перцептивних процесів психіки в умовах норми та органічної патології (ДЦП). На основі розгляду онтогенетичного аспекту вивчення сенсорно-перцептивних процесів здійснено порівняльний аналіз їхнього розвитку при органічному ураженні мозку. Визначено, яким чином під впливом цих процесів формуються ефекти інших рівнів психіки, як змінюється кожний з них і їх взаємодія в ході психічного розвитку дитини. Представлено...
development of the child. The results of the study of such an indicator of the development of sensory-perceptual processes as the accuracy of the execution of eye tasks are presented. Analysis of quantitative indicators points out that the accuracy of the eye in younger pupils increases compared to preschool age, but it is characterized by instability depending on the type of task. At this age, children are already able to establish the relationship of equality and inequality between objects, but at the same time the indicators of dynamics are not yet as accurate as in adults. In addition to significant differences in eye accuracy, a greater heterogeneity of the group of children with cerebral palsy was found in comparison with healthy children in both preschool and primary school age. This suggests that the development of eye has individual properties in children and it is associated with the process of natural maturation. Various disorders of the sensory-perceptual sphere in cerebral palsy are superimposed on the individual measuring features of children, in particular, different degrees of coordination of hand and eye. Conclusion. Taking into account the individual specifics of the child's mental development in relation to the ratio of coordination of visual-motor functions will help to determine the appropriate means of correction and create optimal conditions for subject, educational and work activities.

Keywords: mental development, sensory-perceptual processes, anticipation, eye, children with cerebral palsy.

Introduction

The dynamism and variability of modern life determine the relevance of the study of various forms of human activity, which form the basis for the development and complication of the material world. The specificity of human action is that active movement has not only executive but also research function. The psyche is in a certain relationship with the system and the environment. It reflects the conditions surrounding the body, thus acting as a regulator of movements and actions.

The current state of the study of psychophysiological problems indicates the need to rethink modern ideas about the psyche, consciousness and brain activity. This will promote the development of ideas about the brain “embodiment” of reality in the acts of its sensory-perceptual cognition and the physiological mechanisms of consciousness, through which

resultati дослідження такого показника розвитку сенсорно-перцептивних процесів, як точність виконання окомірних завдань. Аналізування кількісних показників вказує на те, що в порівнянні з дошкільним віком точність окоміру в молодших школярів підвищується, але характеризується нестійкістю в залежності від виду завдання. В цьому віці діти вже здатні встановлювати відношення рівності та нерівності між об'єктами, але водночас показники динаміки поки що не досягають точності, як у дорослих. Окремі достовірні розбіжності у точності окоміру, виявлено більшу неоднорідність групи дітей з церебральним паралічем у порівнянні зі здоровими дітьми як у дошкільному, так і молодшому шкільному віці. Це дає підстави припустити, що розвиток окоміру має індивідуальні властивості в дітей та пов’язаний із процесом природного дозрівання. На індивідуальні вимірювальні особливості дітей накладаються різноманітні порушення сенсорно-перцептивної сфери при ДЦП, зокрема, різний ступінь узгодженості роботи руки та ока. Висновок. Урахування індивідуальної специфіки психічного розвитку дитини щодо співвідношення узгодженості зорово-рухових функцій сприятиме визначеню відповідних засобів корекції та створення оптимальних умов предметної, навчальної та трудової діяльності.

Ключові слова: психічний розвиток, сенсорно-перцептивні процеси, антиципація, окомір, діти з церебральним паралічем.

Вступ

Динамічність та мінливість сучасного життя зумовлюють актуальність вивчення різних форм активності людини, які складають основу для розвитку та укладення матеріального світу. Специфіка людської дії полягає в тому, що активний рух має не лише виконавчу, але й дослідницьку функцію. Психіка знаходиться у певних відношениях із системою та середовищем. Вона відображає умови, що оточують організм, виступаючи, таким чином, регулятором рухів і дій.

Сучасний стан вивчення психофізіологічної проблеми свідчить про необхідність переосмислення сучасних уявлень про психіку, свідомість і діяльність мозку. Це сприятиме використанню уявлень про мозкове “втілення” дійсності в актах її сенсорно-перцептивного пізнання та фізіологічних механізмах
their content is revealed to man as a subject of cognition and activity.

Scientists claim the idea of re-entry of excitations to the sensory-perceptual areas of the brain as a mechanism of consciousness. (Chuprikova, 2018). Since sensory-perceptual processes of the psyche are basic for the development of higher-level processes, the actual direction of scientific research is their study in terms of both normal ontogenesis and organic pathology.

The purpose of the article is to research theoretically and empirically the peculiarities of the development of sensory-perceptual processes of the psyche in the conditions of norm and organic pathology (CP).

Methodology

The methodological bases of the study were: philosophical principles of activity, determinism and development; provisions on a holistic and system-comprehensive approach to the study of mental development of the child; structural-level theory of mental processes; methodical tools for studying the problems of mental development of children.

An integrative phenomenon that determines the degree of activity of an individual is anticipation (from the Latin *anticipatio* – prediction) – a form of advanced reflection of reality, which is a fundamental quality of the psyche and is manifested at different levels in the structure of mental functions (adaptive, regulatory, cognitive, communicative). It underlies various types of mental activity – from the simplest subject manipulations to complex activities. In the sensory organization of a man, anticipation acts as a kind of unifying link that provides transitions from sensation to perception, from perception to imagination, from imagination to thinking.

Depending on the tasks and goals that are solved in the process of activity, five levels of anticipation are determined approximately to the organization of mental reflection of a person: subsensory, sensorimotor, perceptual, representations, speech-thinking. These levels are involved in each of the prognostic processes, interacting with each other within the functional system. Cognitive and regulatory aspects of anticipation are complicated by the transition from one level to another, which is revealed to man as a subject of cognition and activity.
another. The cognitive effect of anticipation arises in the process of active human recognition of signs and elements of certain situations in the process of solving sensory-perceptual problems. Thus, it is the sensory-perceptual processes of the psyche that form the basis on which the development of other levels takes place (Lomov and Surkov, 1980).

Researchers have shown that the basic mechanisms of sensory-perceptual processes in the perception of events are primarily manifested in the movements of the individual’s eyes. This makes it possible to propose new solutions in rehabilitation approaches in the pathology of capturing the events of everyday life (Krotkova et al., 2018).

According to the results of experiments on the perception of static images, it was found that the information for memorization is associated with the spatial pattern of visual fixation (Danilov et al., 2019), and the comparison of eye trajectories at the first and repeated presentation of stimuli can serve as an indicator of the completeness of information stored in memory (Hannula et al., 2010). The logic of the perceptual process, the organization and functions of its motor components make it possible to clarify the effect of the mechanism of regulation of elementary eye movements and its influence on the dynamics of perception. The results of the study confirm the idea of the continuity of the visual process and the possibility of its direct inclusion in the regulation of rapid eye movements (Barabanshchikov, 2018).

The ontogenetic aspect of the study of sensory-perceptual processes makes it possible to determine the age and conditions the effects of different levels are formed and the way of changing each of them and their interaction during the mental development of the child. J. Bruner’s research showed that in the first 3-4 months of a child’s life, based on the perception of objects in a “small” space, the development of special coordination of eye, head and body movements relative to existing objects, elementary sensory-perceptual reactions are formed (Bruner, 1977). Early research activity is polymodal in nature and requires the coordination of all sensory systems.

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The work of T. Tikhomirova, Yu. Kuzmina, S. Malykh presents the results of a longitudinal study of the development of information processing speed during primary school age on the material of setting the reaction time, in which it is proved that during this period the reaction time decreases and information processing speed increases, which indicates the improvement of perceptual processes at this age (Tikhomirova et al., 2020). The process of forming new information is based on the integration in the brain of previously acquired experience based on the basis of appropriate, structured by this experience motor act (Soloviov et al., 2019).

Consideration of the formation of sensory-perceptual processes in ontogenesis shows that in a healthy child they are characterized by consistency, integration, dynamism. Certain patterns of its course necessitate the definition of signs of dysontogenesis as a development that occurs in adverse conditions. L. Vygotsky proposed an approach to the study of mental processes as complex functional systems that cooperate due to the interaction of highly differentiated brain structures, where each contributes to the dynamic integrity, which is an important theoretical basis for the analysis of dysontogenesis (Vygotsky, 1983).

Thus, in the study of Ya. Smirnova “primary psychological” characteristics of atypical development of the child which are determined by the imperfection of sensory-perceptual processes have been revealed, that lead to a violation of social communication. In particular, several options for violation of joint attention through the definition of intentions in the direction of vision are described. Symptoms of deficiency of this skill are variable depending on the specifics of atypical development of the child; secondary deviations in the development of social cognition are specific to a particular primary defect. Limited inflow of information in violation of the analyzer, with the primary damage to sensory-perceptual processes creates unfavorable conditions for the accumulation of experience of social interaction in children. This experience is necessary for the formation of a mental model (Smirnova, 2020). The process of social perception in children with intellectual disabilities is
complicated. The most common cause of conflict and aggressive behavior is impaired production and perception of statements, as well as misunderstanding of the emotions of the other communicator in the communication process (Drozd & Bystrova, 2020). This determines the urgency of the problem of individualization and differentiation in education and upbringing, the solution of which is possible by focusing on the individuality of the child, taking into account the "zone of immediate development" (Yakovleva, 2019).

The process of formation of sensory-perceptual processes is especially complicated by organic lesions of the brain, in particular, in children with cerebral palsy (CP). Different forms of this disease are characterized by different lesions of individual analytical systems and their interaction, which causes the variability of the mental development of these children. The role of the motor analyzer, which performs a kind of communication service between all other analyzers, organizing their work in complex acts of behavior, allows us to understand the deep determinants of sensory cognitive impairment in cerebral palsy.

Impairment of motor functions in cerebral palsy affects visual, auditory, tactile, kinesthetic sensations and perception, disrupts their interaction, limits the variety of impressions of the material world and prevents the creation of a basis for cognitive activity of the child: perception of space, formation of images, simultaneous coverage of text elements when mastering reading and writing (Shipitsina & Mamaychuk, 2001).

Procedures and instruments

An essential indicator of the development of the sensory-perceptual level, which is manifested in the ability to determine spatial quantities without the use of measuring instruments, is the eye. When performing eye tasks, the leading role is played by the fixation attitudes of the eye, the degree of stability of which is an important indicator of the child’s mental development. These processes are improved in complex sighting acts and are based on the consistency of visual-motor coordination. To study this phenomenon, the method of "Crossing" by A. Gafarov, E. Surkov, G. Sukhodolsky was used. The method is based on

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a situation that involves visual and visual-motor extrapolation of vertical segments of straight lines, which the subject must mentally project on a horizontal line.

The subject was presented with an image of a vertical straight segment 32 mm long. Another variable in the experiment was the distance from the end of the vertical segment to its intersection with the horizontal line of the test object. This distance was 80 mm for series I and III series and 60 mm for series II.

The test object was a sheet of white paper measuring 210 x 300 mm in the shape of an ellipse with black lines. This form of writing does not allow the subject to focus on its straight edges, which would greatly simplify the task and would be reduced to the division of the horizontal line into proportional parts. The vertical segment of the line was not located in the center of the horizontal line. The test object was proposed in such a way that the desired vertical segment coincided with the sagittal plane of the subject’s body. The subject was asked to extend mentally the vertical segment to the intersection with the horizontal line and, as most accurately, to indicate with a pencil the intended point of their intersection. The instruction stated that the arm could be brought to a horizontal line only after the imaginary point of intersection had been determined, any auxiliary movements were prohibited. During the task, errors were recorded, which included deviations from the true point of intersection on both the left and right sides. The magnitude of errors was measured in mm. The child was asked to perform the task with a dominant hand considering the peculiarities of motor disorders in cerebral palsy.

The experiment was implemented in three series of investigations. The first series was aimed at identifying the range of errors of spatial representations. The correctly found point of intersection testified to the success of these processes. The second series of experiments involved detecting the presence of a deviation of the error in the direction opposite to the leading hand of the subject with his eyes closed. During the experiment, the child has the ability to perceiving visually an object for 2 seconds, after which the task had to be performed with eyes closed.
If the task was performed with the right hand, the index finger of the left hand of the subject was located by the experimenter at the left end of the horizontal line, and the end of the pencil was located on the vertical segment. The task was to move the pencil away from the sheet and make a mark on the imaginary point of intersection at the level of the location of the index finger of the left hand. When performing tasks with the left hand, the execution procedure changed in reverse order. In this series of experiments, the length of the vertical segment was 32 mm, and the distance to the horizontal line was 60 mm.

In the third series of experiments, the subject’s task was to move the pencil away from the sheet and make a mark on the imaginary point of intersection at the level of the location of the index finger of the left hand. When performing tasks with the left hand, the execution procedure changed in reverse order. In this series of experiments, the length of the vertical segment was 32 mm, and the distance to the horizontal line was 60 mm.

In the third series of experiments, the subject’s task was that he sat at the table, freely lowering both hands, and only with the help of sight estimated the point of intersection of the vertical segment with a horizontal line, comparing this point with the positions of the pencil tip of the horizontal line. Thus, the performance of eye tasks in the first series of experiments was based on the "hand-eye" connection, in the second one the work of the hand under the condition of exclusion of vision was studied, and in the third the work of vision with the exclusion of hands was investigated. The second and third series of experiments were control regarding the first.

Results

The study covered 78 children of preschool and primary school age (including 40 children with cerebral palsy and 38 children with normative development). The analysis of experimental data made it possible to identify differences in the accuracy of performing visual tasks by preschoolers with cerebral palsy and their healthy peers, which are presented in Table 1.

As it can be seen from the table, when finding the middle of the segment in the first series of experimental tasks, children with cerebral palsy committed a greater error in the deviation of the mark from the real point of intersection compared to children with normative development. In the second series of experiments, the difference in the accuracy of performance was even more pronounced.

### Table 1. Basic statistics of error dispersion at performance of eye tasks by preschoolers

<table>
<thead>
<tr>
<th>A series of experiments</th>
<th>Children with cerebral palsy</th>
<th>Children with normative development</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Діти з церебральним паралічем</td>
<td>Діти з нормотиповим розвитком</td>
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<td>М m min max σ</td>
<td>М m min max σ</td>
</tr>
<tr>
<td>I</td>
<td>4.3 .21 2 7 1.7</td>
<td>2.1 .10 1 3 .8</td>
</tr>
<tr>
<td>II</td>
<td>5.5 .48 3 14 3.9</td>
<td>3.0 .18 2 6 1.4</td>
</tr>
</tbody>
</table>

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had an average sample error of 4.3 mm, while healthy children’s indicator was 2.1 mm. When performing the task with closed eyes, the error of sick children was 5.5 mm, and healthy children’s error was 3.0. In the third series of tasks, excluding hand work, the erroneous value of children with cerebral palsy was 3.4 mm, and their healthy peers have 2.2 mm value.

The difficulty of using a linear eye due to the uncoordinated work of the hand and eye, the lack of spatial representations of the standard were directly reflected in the inability of children with cerebral palsy to graphically display the relations between objects. In the process of interpreting the results of the experiment, significant differences were found in the indicators of the studied groups according to Student’s t-test: according to the series of experiments $t = 11; 14.1$ and $7.5$ at $p \leq 0.01$.

The results of the performance of eye tasks by children of primary school age are presented in the table. 2.

The table illustrates the magnitude of the eye error of primary school children decreases in three series of the experiment. For children with cerebral palsy, these indicators were 4.1 mm, 5.2 mm and 3.1 mm, while their healthy peers’ indicators were 1.8 mm, 2.7 mm and 1.9 mm, respectively. When comparing the results of the Student’s t-test, significant differences of indicators between the studied groups were revealed: respectively for a series of experiments $t = 14; 8.9$ and $3.4$ at $p \leq 0.01$.

Analysis of quantitative indicators pointed out that accuracy of the eye of children of primary school age increases in comparison to preschoolers’ indicators, but they are characterized by instability depending on the type of task. At this age, children are already able to establish the relationship

<table>
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<tr>
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<tr>
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<td>4.1</td>
<td>.11</td>
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<tr>
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<td>5.2</td>
<td>.27</td>
<td>3</td>
<td>11</td>
<td>2.2</td>
</tr>
<tr>
<td>III</td>
<td>3.1</td>
<td>.12</td>
<td>1</td>
<td>5</td>
<td>1.0</td>
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</tbody>
</table>

<table>
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<tr>
<th>Children with normative development</th>
<th>M</th>
<th>m</th>
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<tbody>
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<td>1.8</td>
<td>.09</td>
<td>1</td>
<td>3</td>
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<td>III</td>
<td>1.9</td>
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Table 2. Basic statistics of error dispersion at performance of eye tasks by children of primary school age

Як видно з таблиці, при знаходженні середніх відрізків у першій серій експериментальних завдань дітей з церебральним паралічом відбувалося середнє вибіркове значення помилки в 4,3 мм, в той час як у здорових дітей цей показник склав 2,1 мм. При виконанні завдання з закритими очима значення помилки зросли до 5,5 мм, а у здорових – до 3,0. У третьій серії завдань при виключенні роботи руки помилкове значення у дітей з церебральним паралічом склало 3,4 мм, а у їх здорових ровесників – 2,2 мм. Труднощі користування лінійним окоміром, що обумовлена неузгодженою роботою руки та ока, неформованість просторових уявлень про еталон безпосередньо відображалися у невмінні дітей з церебральним паралічом графічно відображені відображенні між об’єктами. У процесі інтерпретації результатів експерименту виявлені значущі розбіжності у показниках досліджуваних груп за т-критерієм Стьюдента: відповідно для серій дослідів $t = 11; 14.1$ та $7.5$ при $p \leq 0.01$.

Результати виконання окомірних завдань у дітей молодшого шкільного віку представлені в табл. 2.

Як ілюструє таблиця, у дітей молодшого шкільного віку зменшується величина помилки окоміру у трьох серіях експерименту. Для дітей з церебральним паралічом ці показники склалі 4,1 мм, 5,2 мм та 3,1 мм, в той час, яку їх здорових ровесників – відповідно 1,8 мм, 2,7 мм та 1,9 мм. При порівнянні результатів за т-критерієм Стьюдента виявлено достовірні розбіжності в показниках між досліджуваними групами: відповідно для серій дослідів $t = 14.3; 8.9$ та $3.4$ при $p \leq 0.01$.

Аналіз кількісних показників вказує на те, що в порівнянні з дошкільним вищою точністю окоміру в молодших школярів підвищується,
of equality and inequality between objects, but at the same time the dynamics are not yet as accurate as in adults. In addition to significant differences in eye accuracy, there was a greater heterogeneity in the group of children with cerebral palsy compared to healthy children in both preschool and primary school age, as evidenced by the indicators of dispersion and standard deviation. This suggests that the development of eye has individual properties in children and is associated with the process of natural maturation. Various disorders of the sensory-perceptual sphere in cerebral palsy are superimposed on the individual measuring features of children, in particular, different degrees of coordination of hand and eye work. The greatest degree of such heterogeneity was manifested in the second series of experiments, when the child performed the task with his eyes closed.

This tendency becomes somewhat weaker with the passing to primary school age (dispersion and standard deviation decreases), which may be due to the action of compensatory mechanisms: both physiological processes (maturation of analyzers and improving their systemic interaction) and the effectiveness of psychocorrectional influences, development of sensory-perceptual processes carried out at work and study. It should also be noted a more significant increase in the accuracy of the eye in children with medium and high levels of success in the tasks, while in the group of low-achieving children, the positive dynamics was less pronounced.

**Discussion**

The analysis of the obtained results indicates that joining the work of the hand leads to deterioration of the eye in preschool children with normative development, and on the contrary, there is a tendency to increase accuracy of the eye in primary school children at the same conditions. Thus, there is a pronounced tendency to improve the coordinated work of the hand and eye with the transition from preschool to primary school age with normal ontogenesis. At the same time, this tendency was quite weak among children with cerebral palsy, because even in primary school age, joining the work of the hand in most
cases did not improve eye, as it is among healthy preschoolers, but reduced the success of the task.

Conclusions

Differences in the eye of children of different ages indicate the development of sensory-perceptual processes due to the enrichment of the experience of the child’s subject activity, which is manifested in the coordinated work of the hand and eye. There was a deterioration in the results of the eye accuracy of children with cerebral palsy, when it was proposed to perform the task not only visually but also by hand. That was due to limited experience and movement disorders. This necessitates the development of eye in those activities where hand kinesthesia is actively involved in the practice of measurement. The study showed that preschoolers’ eye is characterized by the largest error and its stability, regardless of the nature of the measurement tasks. In the primary school age there is an intensive formation of the eye based on maturation of internal regulatory mechanisms that determine its stability to different conditions of the task and is due to the age adjustment of the measuring function. The use of longitudinal sections allowed showing different age dynamics of the eye in both studied categories of children. Individual ability to perform tasks in different experimental series requires in-depth analysis. In some cases, children showed better results when using the hand and eye at the same time, and in others - the task was performed more successfully when turning off the hand. There was also a group of children whose measuring activities were approximately equally effective in all series of tasks. This indicates different types of hand-eye ratios, which are informative about the individual approach in the educational activities of children with cerebral palsy.

As a result of experimental tasks, a tendency to left-sided asymmetry of healthy children was revealed. Their field of view is characterized by great uncertainty and variability simultaneously with the small value. There is a gradual tendency to reduce the number of the group of left-handed asymmetry and its equalization with the group of right-handed asymmetry. At the same time, children with cerebral palsy, with predominant ontogeny. During such a tendency was observed a decrease in the accuracy of movements because of cerebral palsy, which is typical for healthy preschoolers, and reduced the success of the task.

Conclusions

Differences in the eye of children of different ages indicate the development of sensory-perceptual processes due to the enrichment of the experience of the child’s subject activity, which is manifested in the coordinated work of the hand and eye. There was a deterioration in the results of the eye accuracy of children with cerebral palsy, when it was proposed to perform the task not only visually but also by hand. That was due to limited experience and movement disorders. This necessitates the development of eye in those activities where hand kinesthesia is actively involved in the practice of measurement. The study showed that preschoolers’ eye is characterized by the largest error and its stability, regardless of the nature of the measurement tasks. In the primary school age there is an intensive formation of the eye based on maturation of internal regulatory mechanisms that determine its stability to different conditions of the task and is due to the age adjustment of the measuring function. The use of longitudinal sections allowed showing different age dynamics of the eye in both studied categories of children. Individual ability to perform tasks in different experimental series requires in-depth analysis. In some cases, children showed better results when using the hand and eye at the same time, and in others - the task was performed more successfully when turning off the hand. There was also a group of children whose measuring activities were approximately equally effective in all series of tasks. This indicates different types of hand-eye ratios, which are informative about the individual approach in the educational activities of children with cerebral palsy.

As a result of experimental tasks, a tendency to left-sided asymmetry of healthy children was revealed. Their field of view is characterized by great uncertainty and variability simultaneously with the small value. There is a gradual tendency to reduce the number of the group of left-handed asymmetry and its equalization with the group of right-handed asymmetry. At the same time, children with cerebral palsy, with predominant
left-handedness, were more likely to shift the error to the right. The pronounced effect of asymmetry of errors may be due to increased muscle tone due to compensatory muscle strain on one side of the body (when acting with the right hand - the right side and vice versa). The shift of the eye error in one direction or another is characterized by certain features and depends on the location of the lesion.

The study shows the complex dynamics of the formation of the eye as a manifestation of sensory-perceptual processes with the transition from preschool to primary school age. At this time there are not only quantitative but also significant qualitative changes in the process of improving visual spatial-distinguishing functions, which have a great influence on the development of perception of space and cognitive development in general. In addition to general trends, the diagnostics of the sensory-perceptual processes on the material of visual tasks allows identifying individual specifics of mental development of the child in relation to the coordination of visual-motor functions. It will be directly reflected in the subject activity, learning and work, predict its effectiveness and determine appropriate means of correction.

References


