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CHARACTERISTICS OF CHILDREN WITH VISUAL IMPAIRMENTS

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Abstract: This article analyzes the psychophysical, sensory, and cognitive developmental characteristics of children with visual impairments (blind and partially sighted). The etiological factors of visual pathologies (congenital and acquired causes, genetic diseases) and their international medical classifications are examined. The study scientifically highlights the role of special education (typhlopedagogics), sensory compensation mechanisms (tactile and auditory perceptions), and spatial orientation in preventing and correcting secondary defects caused by primary visual impairments. Furthermore, it provides a brief overview of the contributions made by global and Uzbek scholars to the development of this field.

Keywords: Children with visual impairments, the blind, partially sighted, typhlopedagogics, compensation, primary defect, secondary defect, tactile perception, spatial orientation, Braille alphabet, visual acuity.

Here is the complete and precise English translation of the article, maintaining the exact paragraph and text structure as you provided:

Children with visual impairments are angels who see the world differently. They perceive light not with their eyes, but with their hearts. Every sound, every touch, and every word is as precious to them as a guiding star. The faint clinks and rustles around them provide direction, while a gentle hand offers a sense of security. For these children, the world is a bit quieter and more serene, but never narrow—because their inner world is boundless. This children are the simplest and brightest examples of courage. Whether waking up in the morning, entering a classroom, or learning a new letter or direction, they perform acts of heroism without even realizing it. Because every single day, they overcome a new obstacle, sense a new meaning, and discover a new opportunity.

Disorders of the visual process can be either congenital or acquired. Congenital blindness can occur due to diseases or injuries sustained by the fetus while in the womb, or it can result from the hereditary transmission of certain visual defects. Hereditary visual impairments are pathologies of the eye and visual system transmitted from generation to generation through genetic factors. Such defects are often formed due to hereditary gene mutations or chromosomal changes. They include congenital glaucoma, congenital cataracts, hereditary retinal degenerations (e.g., retinitis pigmentosa), hereditary forms of myopia or hyperopia, as well as genetic disorders of the optic nerve. Genetic defects are accompanied by decreased visual acuity, impaired light sensitivity, or retinal dysfunction. These types of visual impairments require early diagnosis and comprehensive rehabilitation, as they can become more complex during the developmental process. Typically, acquired visual impairment occurs as a result of diseases affecting the visual organs—such as the retina or cornea—diseases of the central nervous system (meningitis, brain tumors, meningoencephalitis), general systemic infections (measles, influenza), or traumatic brain injuries. Disorders of the visual analyzer can be classified into progressive and stable types. In progressive visual impairments, the continuous deterioration of the visual process occurs due to pathological influences. For instance, in glaucoma, intraocular pressure rises, leading to degenerative changes in eye tissues. Additionally, when sanitary and hygienic

standards are neglected (during reading and writing), nearsightedness and farsightedness develop. Conditions such as astigmatism and cataracts belong to the stable defects of the visual analyzer. Such defects can result from certain diseases or previous eye surgeries. Consequently, visual analyzer disorders in children can manifest either during pregnancy or after birth. Therefore, children can be categorized into groups of those born blind, those who lost their sight at a very early age, and those who lost their sight after the age of 3. This differentiation is based on the fact that the age at which a child loses their sight is of immense significance for their subsequent development. For example, congenitally blind children completely lack various figurative representations in their memory, whereas children with late-acquired visual impairments retain these figurative representations to some extent or volume. The onset and timing of the visual defect play a crucial role in the child's psychic and physical development. The earlier blindness begins, the more prominently secondary defects and psychophysical characteristics manifest. The psychic development of congenitally blind children is similar to that of healthy children, but the absence of visual orientation manifests predominantly in their range of motion and lifestyle. For the blind, sound signals take on a unique role as landmarks; while sounds play an important role for sighted children as well, for blind children, auditory signals serve as the primary factor for orientation. The loss of vision shapes unique experiential perceptions within a child's character and emotional-volitional sphere. In congenitally blind children, the development of higher cognitive processes (curiosity, logical thinking, memory, speech) proceeds normally. At the same time, the disruption of the interconnectedness between sensory and intellectual functions manifests as a predominance of abstract thinking over concrete-object thinking. The distinction between late-blinded children and congenitally blind children depends on the time when the visual process was lost. The later a child loses their sight, the more visual representations they retain, and these can be reconstructed through verbal expressions. If these visual memories are not developed, they can gradually fade from memory.

Children with visual impairments possess all the necessary capabilities for high-level psychophysical development and a comprehensive understanding of the surrounding world by relying on the intact analytical systems remaining in the child. Within special education settings, unique methods are formed to develop the foundational sensory analyzers—including auditory, cutaneous (skin), olfactory, vibratory, and other psychic processes. As a result, opportunities arise for compensatory perception, meaning the development of alternative forms of the cognitive process. L.S. Vygotsky pointed out that the blind possess a "sixth sense" (temperature sensitivity), which allows them to perceive objects at a distance and even sense colors. In the educational process, teachers and parents must recognize that the compensation for blindness begins from the very first months of a child's life.

According to L.I. Solntseva, the compensation for blindness encompasses the entire system of psychic development, the sensory system, and intellectual components, which enable children to actively and adequately reflect the external world, allowing them to engage in various age-appropriate activities. Partially sighted individuals utilize their residual vision when interacting with objects, observing phenomena, orienting themselves in space, and moving around. For instance, color perception is often impaired in visually impaired individuals. In cases of severe myopia or hyperopia, they might fail to notice faint, blurry details that define an object. When specialized education begins early, normal field vision and stereoscopic vision develop and improve significantly, allowing them to perceive complex spatial layouts in the future. Among the partially sighted, individuals with impaired color differentiation and insufficient visual contrast sensitivity are common, and congenital forms of color blindness also occur.

Impairments in oculomotor functions affect how objects are perceived and depicted; they prevent the gaze from fixing on a specific point and create difficulties in evaluating dynamic changes, linear dimensions, and conditional sizes. Therefore, correctional work is directed toward utilizing specialized observation methods based on hearing, taste, and smell, which enables children to construct complex synthetic images of real life. Residual vision in low-vision individuals is highly important for their development, education, labor, and social adaptation; thus, it must be carefully preserved through regular diagnosis, periodic check-ups with an ophthalmologist, and consultations with typhlopedagogues and psychologists.

Tactile perception via the skin plays a crucial role for blind and partially sighted individuals in perceiving and understanding the world around them. Tactile perception is provided by a complex set of sensations (touch, pressure, heat, cold, pain, material texture, etc.), through which the shapes, sizes, and proportional relationships of objects are determined. Various sensations received by nerve endings in the skin and mucous membranes are transmitted to the areas of the cerebral cortex connected with the functioning of the hands and fingers.

In this way, blind individuals learn to "see" with their hands and fingers. For this reason, training and upbringing for blind and visually impaired children involve differential exercises: distinguishing and evaluating the characteristics of objects using sound, analyzing and evaluating complex acoustic environments, and connecting sound signals to specific objects, devices, and mechanisms, as well as the processes occurring within them. The successful mastery of various types of activities (object-related play, games, labor, study) by visually impaired individuals is closely linked to a high level of provision with visual aids, as well as the development of spatial thinking and spatial orientation.

Spatial orientation is an essential component of moving freely in space. Thus, children with visual impairments can be divided into two main groups:

1. The Blind
2. The Partially Sighted.

Based on visual acuity, the blind are divided into two types:

1. Total blind: Visual acuity is 0.
2. Partially blind: Visual acuity is up to 0.05 (with light perception).

By origin:

- Congenitally blind.
- Acquired blind.

The partially sighted are classified by visual acuity as follows: a) 0.05 to 0.1 (Instruction is organized using the Braille alphabet) b) 0.1 to 0.2 c) 0.2 to 0.4, and up to 0.9.

Along with low visual acuity, some children may experience a narrowed visual field and disrupted spatial perception (especially children with a visual acuity of 0.1). All of this negatively impacts the perception and mastery of educational material. It is highly beneficial for visually impaired children to be educated in special conditions using specialized methods, equipment, and technical or optical aids. In their education and upbringing, special attention is paid to developing visual perception.

Visual impairment can also result from various specific diseases, including:

Albinism - A congenital condition characterized by the absence of pigment in the skin, eyes, and hair. Individuals may have colorless skin and very bright white-blonde hair. Albinism directly impacts visual function.

Cataracts - This involves the clouding of the eye's natural lens, making clear vision difficult. Cataracts are often linked to several causes. Many children are born with cataracts. It can also stem from eye inflammation, swelling, and other ocular diseases, during which the child's eye may appear smaller than usual. Maternal infections during pregnancy can also cause congenital cataracts.

Diabetes-related eye disease - Indicated in many countries as a leading cause of visual impairment. It can lead to glaucoma, cataracts, and diabetic retinopathy.

Glaucoma - The optic nerve transmits information to the brain. When it is damaged, pressure inside the eye increases. If the pressure is too high, the child may experience discomfort in sunlight or bright light, and strabismus (crossed eyes, where the eyes look in different directions) may develop.

River blindness - Inflicted by the blackfly that lives near rivers, it damages all the internal tissues of the eyes, causing bleeding, redness, swelling, and other severe complications that ultimately lead to blindness. 99% of affected individuals live in Africa, while the remaining 1% live in Yemen, Mexico, Guatemala, Ecuador, Colombia, and Venezuela. Myopia (nearsightedness) and Hyperopia (farsightedness) can occur either with or without astigmatism.

Trachoma - An infectious disease transmitted by flies, leading to discharge from the eye. If the infection recurs over several years, it causes scarring inside the eyelids, painful blinking, and can eventually result in total blindness.

In the process of special education and upbringing, efforts are made to awaken an interest in learning among visually impaired students, satisfy their needs for development and independent knowledge, foster their thinking capacities based on their individual potential, prepare them for professional activities, and develop the concepts, skills, and abilities necessary for labor in modern socio-economic conditions.

It is vital to create favorable conditions for the comprehensive development of a visually impaired child's personality, fostering their desire for creative self-expression and unveiling individual creative abilities. Stimulating the socialization of the visually impaired child involves enriching their social experience, preparing them for communication and collaborative activities with others, teaching them cultural values and encouraging active participation in cultural life. Furthermore, it nurtures moral consciousness during exposure to aesthetic concepts and principles, strengthens feelings of duty and responsibility, aids physical development, reinforces personal hygiene skills, and cultivates a healthy lifestyle, industriousness, independence, and self-control. Comprehensive development helps these children acquire effective social cooperation skills and fosters an aesthetic relationship with the world.

Valentin Haüy (1745-1822) is considered the founder of typhlopedagogics and the education of the visually impaired. Along with his contemporary and follower, the French philosopher Denis Diderot, he laid the groundwork for the first educational institutions for the visually impaired in France and Russia. Thanks to Haüy, a systematic approach to teaching visually impaired individuals was established, and society began viewing them as full-fledged members who required education and social adaptation. Louis Braille created the tactile six-dot embossed writing system. E.B. Ryabkin studied congenital and acquired forms of color blindness. B.I. Kovalenko, a professor at the Leningrad Pedagogical Institute named after A.I. Herzen,

contributed significantly to the development of typhlopedagogics and methods for teaching general education subjects to the blind. M.I. Zemtsova, A.I. Litvak, V. Fromm, and Ya. Yasensky researched the specific features of cognitive development based on the degree of visual impairment. Among Uzbek researchers, Sh. Khalilova conducted research in 2005 on "Characteristics of Thinking in Children with Visual Impairments," while O. Rustamov studied the formation of mathematical concepts in visually impaired children. Additionally, young scholars such as D. Sultonova, N. Abidova, and Z. Djalolova are currently conducting research on studying and improving the specific aspects of pedagogical-correctional work with visually impaired children. These authors have successfully published a series of textbooks, educational manuals, curricula, and scientific articles.

In blind and partially sighted children, primary defects emerge directly from the pathology: issues with visual acuity, color differentiation, visual field, light sensitivity, and so forth.

Visual acuity is the eye's ability to distinguish two separate points at the minimum possible distance from each other.

Visual field is the entire area that a person can see and perceive when the eyes and head remain stationary.

When specialized and correctly selected educational methodologies are not applied, secondary defects emerge. These may include: — incomplete formation of sensory apparatuses; — deficiencies in representations and concepts; — shortcomings in logical thinking; — delays or deficiencies in speech development; — deficiencies in motor skills and movement.

The opportunity to correct these secondary defects exists only within specialized educational and upbringing environments. Children suffering from amblyopia experience disruptions in visual perception and the motor sphere (impaired accuracy and coordination of movements, poor fine motor skills, difficulty orienting in space, and a lack of developed understanding of "left" and "right" when dealing with mirror reflections). Their scope of object-related representations is somewhat limited. Blind children have a significantly smaller store of object representations and struggle to operate with existing mental images. Blind preschool children often exhibit low mobility, lack precisely formed motor skills, and experience significant disruptions in spatial orientation, distinguishing directions, and facing spatial difficulties while moving. In blind children, secondary defects also manifest in cognitive activity through a scarcity of ideas about objects, a total absence of certain concepts, or fragmented and disjointed representations.

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