INTERNATIONAL MULTI DISCIPLINARY JOURNAL FOR RESEARCH & DEVELOPMENT
eISSN 2394-6334 Impact factor: 8.854 Volume 13, issue 06 (2026)

ISSUES OF TRANSFORMATION OF THE COGNITIVE SPHERE IN A PERSON

Salakhidinova Khalida Khaliljonovna
Associate Professor of the Department of “Pedagogy,
Psychology and Physical Culture” of the Andijan
Branch of Kokand University, Doctor of Philosophy (PhD) in Psychology
xolidasalaxidinova@gmail.com.
Orcid:0009-0000-6260-7439

Annonation. The article explores the issues of transforming the cognitive and emotional spheres of a person through a neuroaesthetic approach. The neurobiological foundations of art and aesthetic perception, their impact on personality development at different age periods (childhood, adulthood, old age) are analyzed. The purpose of the study is to reveal the mechanisms of optimizing cognitive processes through aesthetic experience.

Keywords: neuroaesthetics, cognitive sphere, transformation, emotional intelligence, neuroplasticity, aesthetic perception.

Introduction. In modern psychology, it is proven that the intellectual and emotional development of a person is formed not only through logical exercises, but also through aesthetic experience. Neuroaesthetics, as a field that studies the brain's ability to perceive beauty and create, opens up new horizons in transforming the cognitive sphere.

Increased information load in people of different ages leads to cognitive fatigue and emotional stagnation. Neuroaesthetic stimulation acts as a "soft" (soft skills) mechanism in solving these problems.

Modeling psychological mechanisms of transformation of the cognitive-emotional sphere based on the neuroaesthetic approach.

Methods: The following methods were used in the study:

1. Theoretical analysis: Analysis of international literature in the field of neuropsychology and aesthetics (concepts of Semir Zeki, V. Ramachandran).

2. Comparative age analysis: Comparison of cognitive changes from childhood to old age.

3. Cognitive modeling: Study of the impact of aesthetic perception on the brain's neural networks (default mode network).

Results: As a result of the study, the transformation of the cognitive sphere was examined in three main age blocks.

1. Childhood and adolescence: the formation of neural connections.

At this stage, the neuroaesthetic approach increases "cognitive flexibility". Engaging in art strengthens the connection between visual perception and sensory motor skills in children. The transformation mechanism is neurogenesis and synaptic plasticity.

The cognitive sphere of a person is understood as the complex of all mental processes associated with a person's perception of information from the outside world, its processing, storage and use. In simple terms, this is the system of our mental capabilities.

The cognitive sphere includes the following main processes.

1. Perception is the very first stage of the cognitive process. Through the five senses (vision, hearing, smell, taste and touch), we receive signals from the external environment. For example, we see the color of an apple or feel its smell.

2. Perception is the integration of signals from the senses into a single image in our minds. For example, by combining the color red, the shape round, and the smell sweet, we can perceive that "this is an apple."

3. Attention - the ability to direct our consciousness to a specific object or activity and concentrate it. Without attention, information cannot be perceived qualitatively. It acts as a "filter" for cognitive processes.

4. Memory - the ability to remember, store, and, if necessary, restore (recall) information. Without memory, learning and experience are impossible.

5. Thinking - the highest and most complex process of the cognitive sphere. This is the ability to analyze, compare, generalize, draw conclusions, and solve problems. With the help of thinking, we can also understand connections beyond what we see.

6. Imagination - the ability to create an image of something that does not exist in the brain or to process past experiences in a new way. This is the basis of creativity.

7. Speech is a means of expressing our thoughts through words and understanding the thoughts of others. Speech is closely related to thinking (we think and turn it into words)

The formation of neural connections during childhood and adolescence is one of nature's most complex and monumental "engineering" processes. During this period, the brain not only grows in size, but also its internal "wiring" (neural networks) is completely rebuilt.

From a neuroesthetic and cognitive point of view, this process can be understood in the following stages. Childhood (especially from 0 to 7-10 years old) is a period of a sharp increase in the number of synapses (connections between neurons) in the brain.

Synaptogenesis: In the first years after birth, millions of new neural connections are formed every second. The brain of a 2-3-year-old child has twice as many synapses as an adult.

The role of sensory experience. During this period, neural connections are formed mainly on the basis of external sensory signals (vision, hearing, touch). In the language of neuroaesthetics, a child's seeing a beautiful toy or hearing music builds "bridges" between the visual and auditory centers in the brain.

The Gupka effect. Since the brain is very plastic, any aesthetic stimulation (colors, shapes) is imprinted in neural circuits.

By adolescence (from the age of 11-12), the brain begins to move from quantity to quality. Now it's not about creating new connections, but about organizing existing ones.

Curiosity. The principle of "if not used, it disappears" works. The brain "cuts" rarely used, weak connections and strengthens frequently used ones. This process increases the efficiency of the brain.

Insulation. The surface of neuron fibers (axons) is covered with a myelin sheath. This is similar to the "insulation of an electrical wire". Thanks to myelin, the speed of information transmission is accelerated up to 100 times.

Formation of the prefrontal cortex. In adolescence, the prefrontal cortex, which is responsible for logic and control, is not yet fully formed, but the emotional center (limbic system) is very active. Therefore, adolescents are very sensitive to aesthetic and emotional influences (music, fashion, art).

From the point of view of neuroaesthetics, how does art affect the formation of neural connections in childhood and adolescence?

The reward system Enjoying a work of art or the creative process releases dopamine in the brain. Dopamine is a chemical catalyst that ensures the "stickiness" (strength) of new connections between neurons.

Cognitive flexibility. Aesthetic experience (for example, drawing a picture or trying to understand a complex melody) forces different parts of the brain (vision, movement, logic) to work simultaneously. This creates "cross-modal" (cross-modal) connections.

Emotional intelligence. In adolescence, analyzing emotions through art helps to establish a strong connection between the limbic system and the prefrontal cortex in the brain. This forms the adolescent's ability to manage their emotions (transformation).

Formation of neurobiological architecture During childhood, the brain collects "raw materials" (numerous connections), with the aesthetic environment acting as the foundation. During adolescence, the brain, like a "sculptor", removes excess connections and strengthens important pathways (through myelin).

2. Adolescence: stress management and creative thinking.

In adults, the transformation of the cognitive sphere is aimed at breaking "cognitive rigidity" (fixed thinking). Aesthetic experience activates the "reward system" of the brain (dopaminergy), which increases the ability to creatively approach problems (divergent thinking).

During adulthood (approximately from 25 to 55-60 years old), the transformation of the cognitive-emotional sphere is fundamentally different from that in childhood. If in childhood the brain is a "construction site", then in adulthood it enters the stage of "reconstruction and optimization".

Based on the neuroaesthetic approach, the mechanisms of stress management and the development of creative thinking during this period can be explained as follows.

Stress management: The mechanism of "limbic inhibition". A person in adulthood is under constant social and professional responsibility, which causes chronic stress (high levels of cortisol).

Amygdala and prefrontal cortex balance: During stress, the brain’s “danger center” (amygdala) becomes activated and blocks logical thinking. The transformation mechanism in adulthood is to increase the prefrontal cortex’s control over the amygdala.

Neuroaesthetic effect: Aesthetic perception (for example, a natural landscape or classical music) activates the parasympathetic nervous system. This reduces “noise” in the brain and puts neurons into “rest mode.”

Psychological transformation: Through aesthetic experience, a person gains the ability to “re-evaluate” a stressful situation. That is, they begin to view the problem not only as a threat, but as a “task” to be solved.

Creativity in adulthood is more related to “cognitive flexibility,” unlike childhood fantasy.

Creativity: This brain network is activated when we are not thinking about anything or when we are daydreaming. This is where creative ideas are born.

CEN (the rigid director of our brain): this network is responsible for focusing attention and implementing ideas.

Transformational mechanism: Creative thinking in adulthood is an effective dialogue between the DMN (imagination) and CEN (logical execution). Neuroaesthetic exercises (for example, cognitive drawing or metaphorical thinking) strengthen the neural connections between these two networks. This accelerates the "Aha!" moment (finding a subtle, unexpected solution).

Overcoming "cognitive rigidity": The greatest danger of adulthood is the hardening of thinking (rigidity). A person begins to rely on his own experience and reject new solutions.

Maintaining neuroplasticity: An aesthetic “shock” or a new aesthetic experience (for example, studying a previously incomprehensible art form) forces the brain to break out of its usual patterns.

Mechanism: The brain is forced to build new neural circuits to process a new and complex aesthetic object. This process enriches the “cognitive reserve” and makes thinking elastic (flexible).

Emotional intelligence and the “flow” state. In adulthood, the creative process and stress management merge in the “flow” state.

When a person finds a balance between their skills and the complexity of the task at hand (in neuroaesthetic activities, for example, in design or architecture), a cocktail of dopamine, serotonin, and endorphins is produced in the brain.

In this case, stress drops to zero, and cognitive efficiency rises to a maximum. This is the highest point of transformation in the cognitive sphere for a mature person. Transformation in adulthood is a synthesis between the brain's emotional stability (stress tolerance) and intellectual flexibility (creativity). Neuroaesthetics acts as a catalyst in this process, protecting the brain from "stiffening" and taking it to a new level.

3. Old age: maintaining cognitive reserve.

In older people, transformation manifests itself in the form of preventing regression. Neuroaesthetic stimulation (music, painting) helps to keep neurons active and slow down memory decline.

Attention is the "gatekeeper" of cognitive processes. If attention does not work well, information does not enter memory and the thinking process slows down. Attention can be trained like a muscle. In old age (over 60 years old), the transformation of the cognitive sphere is mainly of a "protective and compensatory" nature. During this period, despite the physiological aging of the brain, it activates unique mechanisms to maintain its functional capabilities. The neuroaesthetic approach is one of the most effective "non-drug" methods of maintaining cognitive reserve in old age. 1. What is cognitive reserve? (The “reserve fund” of the brain) Cognitive reserve is the ability of the brain to maintain its function despite pathological changes (neuronal loss, aging).

Mechanism: If one part of the brain (for example, the memory center) is weakened, the brain of a person with high cognitive reserve begins to process information through other neural pathways.

Role of neuroaesthetics: Art, reading, and aesthetic activities increase the “neuronal density” in the brain, which enriches the reserve fund.

2. Neurocompensation: HAROLD and STAC Models The aging brain works differently than the young brain: Harold model: While young people use one hemisphere of the brain to perform a task, older people use both hemispheres to compensate. Neuroaesthetic stimulation: Analyzing complex visual art or listening to music activates the connection between the two hemispheres of the brain and prevents the breakdown of neuronal networks.

3. Aesthetic perception and “crystallized intelligence”

In old age, “fluid intellect” (quick decision-making) declines, but “crystallized intelligence” (experience, vocabulary, generalization) peaks. Transformation: When older people see a work of art, they perceive it not simply as a form, but as a metaphor with deep meaning through the prism of life experience. This process strongly stimulates the prefrontal cortex (the center of wisdom and analysis) of the brain.

Emotional stability: Neuroaesthetics acts as a “positive filter” for the elderly. They pay more attention to beauty and aesthetic harmony than to negative information, which protects against depression.

4. Practical effects of neuroaesthetic activities: 3 main ways to maintain cognitive reserve in old age: music therapy: Music activates the deepest neural networks associated with memory (hippocampus). Even in the early stages of dementia, music can restore long-term memory and maintain cognitive stability. Fine motor skills: Drawing, sculpting, or painting connects the motor and sensory parts of the cerebral cortex. This maintains brain plasticity. Museums and galleries: A new aesthetic environment causes the brain to release “neurotrophins” (nutrients that nourish neurons). The formula for transformation in old age The transformation of the cognitive-

emotional sphere in old age is based on the following formula: “active esthetic perception = preservation of neuronal plasticity + emotional stability”

Neurocompensation: HAROLD and STAC Models The aging brain works differently than the young brain: Harold model: While young people use one hemisphere of the brain to perform a task, older people use both hemispheres to compensate. Neuroaesthetic stimulation: Analyzing complex visual art or listening to music activates the connection between the two hemispheres of the brain and prevents the breakdown of neuronal networks.

3. Aesthetic perception and “crystallized intelligence”

In old age, “fluid intellect” (quick decision-making) declines, but “crystallized intelligence” (experience, vocabulary, generalization) peaks. Transformation: When older people see a work of art, they perceive it not simply as a form, but as a metaphor with deep meaning through the prism of life experience. This process strongly stimulates the prefrontal cortex (the center of wisdom and analysis) of the brain.

Emotional stability: Neuroaesthetics acts as a “positive filter” for the elderly. They pay more attention to beauty and aesthetic harmony than to negative information, which protects against depression.

4. Practical effects of neuroaesthetic activities: 3 main ways to maintain cognitive reserve in old age: music therapy: Music activates the deepest neural networks associated with memory (hippocampus). Even in the early stages of dementia, music can restore long-term memory and maintain cognitive stability. Fine motor skills: Drawing, sculpting, or painting connects the motor and sensory parts of the cerebral cortex. This maintains brain plasticity. Museums and galleries: A new aesthetic environment causes the brain to release “neurotrophins” (nutrients that nourish neurons). The formula for transformation in old age The transformation of the cognitive-emotional sphere in old age is based on the following formula: “active esthetic perception = preservation of neuronal plasticity + emotional stability”

Neurocompensation: HAROLD and STAC Models The aging brain works differently than the young brain: Harold model: While young people use one hemisphere of the brain to perform a task, older people use both hemispheres to compensate. Neuroaesthetic stimulation: Analyzing complex visual art or listening to music activates the connection between the two hemispheres of the brain and prevents the breakdown of neuronal networks.

3. Aesthetic perception and “crystallized intelligence”

In old age, “fluid intellect” (quick decision-making) declines, but “crystallized intelligence” (experience, vocabulary, generalization) peaks. Transformation: When older people see a work of art, they perceive it not simply as a form, but as a metaphor with deep meaning through the prism of life experience. This process strongly stimulates the prefrontal cortex (the center of wisdom and analysis) of the brain.

Emotional stability: Neuroaesthetics acts as a “positive filter” for the elderly. They pay more attention to beauty and aesthetic harmony than to negative information, which protects against depression.

4. Practical effects of neuroaesthetic activities: 3 main ways to maintain cognitive reserve in old age: music therapy: Music activates the deepest neural networks associated with memory (hippocampus). Even in the early stages of dementia, music can restore long-term memory and maintain cognitive stability. Fine motor skills: Drawing, sculpting, or painting connects the motor and sensory parts of the cerebral cortex. This maintains brain plasticity. Museums and galleries: A new aesthetic environment causes the brain to release “neurotrophins” (nutrients that nourish neurons). The formula for transformation in old age The transformation of the cognitive-emotional sphere in old age is based on the following formula: “active esthetic perception = preservation of neuronal plasticity + emotional stability”

Neurocompensation: HAROLD and STAC Models The aging brain works differently than the young brain: Harold model: While young people use one hemisphere of the brain to perform a task, older people use both hemispheres to compensate. Neuroaesthetic stimulation: Analyzing complex visual art or listening to music activates the connection between the two hemispheres of the brain and prevents the breakdown of neuronal networks.

3. Aesthetic perception and “crystallized intelligence”

In old age, “fluid intellect” (quick decision-making) declines, but “crystallized intelligence” (experience, vocabulary, generalization) peaks. Transformation: When older people see a work of art, they perceive it not simply as a form, but as a metaphor with deep meaning through the prism of life experience. This process strongly stimulates the prefrontal cortex (the center of wisdom and analysis) of the brain.

Emotional stability: Neuroaesthetics acts as a “positive filter” for the elderly. They pay more attention to beauty and aesthetic harmony than to negative information, which protects against depression.

4. Practical effects of neuroaesthetic activities: 3 main ways to maintain cognitive reserve in old age: music therapy: Music activates the deepest neural networks associated with memory (hippocampus). Even in the early stages of dementia, music can restore long-term memory and maintain cognitive stability. Fine motor skills: Drawing, sculpting, or painting connects the motor and sensory parts of the cerebral cortex. This maintains brain plasticity. Museums and galleries: A new aesthetic environment causes the brain to release “neurotrophins” (nutrients that nourish neurons). The formula for transformation in old age The transformation of the cognitive-emotional sphere in old age is based on the following formula: “active esthetic perception = preservation of neuronal plasticity + emotional stability”

Conclusion. In the conclusion of your article, you can note that the neuroaesthetic approach is the main mechanism that transforms old age from a period of “fading” to a period of “aesthetic wisdom”. This allows you to maintain the cognitive sphere of a person in a functional state until the end of his life.In the conclusion of your article, you can note that the neuroaesthetic approach is the main mechanism that transforms old age from a period of “fading” to a period of “aesthetic wisdom”. This allows you to maintain the cognitive sphere of a person in a functional state until the end of his life.In the conclusion of your article, you can note that the neuroaesthetic approach is the main mechanism that transforms old age from a period of “fading” to a period of “aesthetic wisdom”. This allows you to maintain the cognitive sphere of a person in a functional state until the end of his life.In the conclusion of your article, you can note that the neuroaesthetic approach is the main mechanism that transforms old age from a period of “fading” to a period of “aesthetic wisdom”. This allows you to maintain the cognitive sphere of a person in a functional state until the end of his life.

References

1. Zeki S. Inner Vision: An Exoloration of Art and the Brain. Oxsford University press.
2. Ramachandran V.S. and Hirstein W. The Science of art: A Neurological theory of Aestetic Experience. Journal of Consciousness stadies 6. 1999 15-51 p.
3. SALAHIDINOVA, X. (2024). THE IMPORTANCE OF DRAWING IN THE MENTAL DEVELOPMENT OF PRESCHOOL CHILDREN. *«ACTA NUUz»*, *1*(1.8), 160-162.
4. Haliljonovna, Salakhidinova K. "Psychological Possibilities OF Forming Interests in Visual ARTS in Preschool Children." *Galaxy International Interdisciplinary Research Journal*, vol. 12, no. 3, 27 Mar. 2024, pp. 438-442.
5. Salakhidinova, K. (2024). Psychological Features of the Formation of Fine Arts Motives in Preschool Children. *SPAST Reports*, *1*(1).

6. SALAXIDINOVA, X. (2025). THE FORMATION OF INTEREST IN DRAWING IN PRESCHOOL CHILDREN AS A DEVELOPMENTAL FACTOR. *«ACTA NUUz»*, *1*(1.6.1), 144-146.
7. Salahidinova, H. (2021). Motivation problem in preschool children. In *International Scientific and Current Research Conferences* (pp. 147-150).