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11. THE IMPORTANCE OF MUSICAL EDUCATION FOR CHILDREN IN EARLY CHILDHOOD

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Abstract: *Humans uniquely possess the highest form of knowledge – art. Through art, we construct worlds where we experience emotions and events that are not directly our own. Recent anthropogenetic studies have shown that the humanoid developmental line that survived was the one that began creating and expressing emotions in primitive artistic forms. Thus, embracing art is a natural progression for the human species. Drawing on the parallels between phylogenetic and ontogenetic isomorphism, art can be integrated into a child's development from the earliest moments of life, including during the prenatal stage.*
Key words: *art, ontogeny, brain, neuroplasticity, child development*

1. Introduction

With the rise in life expectancy, one of the key challenges faced by modern society is maintaining mental health. This issue is evident in the health and education policies of the Republic of Moldova, where a decline in physical and psycho-emotional well-being, academic performance, and teaching efficiency among children, students, and teachers has been noted. Furthermore, there has been an increase in the number of adolescents and young people with psycho-emotional disorders (as highlighted in the "Education 2030" Development Strategy) and a rise in mental health issues (a challenge addressed by Objective 5 – Improving Physical and Mental Health in the National Development Strategy, "Moldova 2030"). Additionally, the number of children with developmental delays, speech disorders, and attention deficits is on the rise, an observation evident even without exhaustive statistics.

2. Discussions

Various proposed solutions and special programs are undoubtedly welcome and effective. However, we believe that a significant factor, known and applied particularly in therapeutic pedagogy, should also be considered: the influence that music can exert on the harmonious development of an individual. Anthropologists, sociologists, and linguists studying human emergence and development agree that language, as a form of communication and thought, is the faculty that transformed the humanoid into a human. Within this triad – human, language, thought – music also finds its place, at least according to theories that suggest a pre-linguistic musical phase in human development. Humans sang first, without semantic meaning. Darwin described these songs as mating rituals that laid the groundwork for the development of articulated language. "What Darwin’s scenario (and those of his successors) have in common is the idea that we became singers before we became speakers and that the voice evolved to produce beautiful sounds, without them

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necessarily having meaning."[295]

Whether we consider music a factor in the evolution of language or view it as a language in itself (a phase of its evolution), it is clear that human nature is also defined by this faculty – music. We can present numerous arguments to support this claim. It is no coincidence that lullabies calm young children; they react positively to harmonious sounds and cry at dissonant noises. Similarly, we can note that no human community exists without music.[296] Even in the most primitive communities, where various forms of art may be absent, music is invariably present. Therefore, music is a natural part of human evolution. For this reason, and considering the phylogenetic and ontogenetic isomorphism, music can be incorporated into a child's development from the earliest moments of life, including during the prenatal stage.

Contemporary cognitive studies attribute a biological nature to music in humans. "We have a music instinct as much as a language instinct. It might be genetically hard-wired, or it might not. Either way, we can't suppress it, let alone meaningfully talk of taking it away."[297] Attention to the importance of music in cognitive science was sparked by Steven Pinker's assertion that music serves a purely hedonistic role, without which the human species would have evolved just as it has: "Compared with language, vision, social reasoning, and physical know-how, music could vanish from our species, and the rest of our lifestyle would be virtually unchanged. Music appears to be a pure pleasure technology, a cocktail of recreational drugs that we ingest through the ear to stimulate a mass of pleasure circuits at once."[298] Steven Pinker also asks, "But if music confers no survival advantage, where does it come from and why does it work? I suspect that music is auditory cheesecake, an exquisite confection crafted to tickle the sensitive spots of at least six of our mental faculties."[299]

By describing music as *auditory cheesecake* or a *cocktail for pleasure* and claiming it offers no evolutionary advantage, Steven Pinker challenged researchers to rehabilitate the human essence of music, demonstrating its connections to the brain, intellect, logic, and emotions. One such perspective is offered by Joseph Carroll, who takes the opposite stance, arguing that music is a factor in humanizing humans: "Now, art, music, and literature are not merely the products of cognitive fluidity. They are important means by which we cultivate and regulate the complex cognitive machinery on which our more highly developed functions depend."[300] In the absence of any form of art, humans become dehumanized, as they are deprived of emotions and ideas. These, Carroll argues, are "forms of communication, and what they communicate are the qualities of experience. Someone deprived of such

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[295] Johansson, S. (2022). *Zorii limbajului*, traducere din suedeză de Cristian Iscrulescu, Editura Humanitas, Bucureşti. p. 288

[296]Darwin asserts in this regard: "As neither the enjoyment nor the capacity of producing musical notes are faculties of the least use to man in reference to his daily habits of life, they must be ranked amongst the most mysterious with which he is endowed. They are present, though in a very rude condition, in men of all races, even the most savage; but so different is the taste of the several races, that our music gives no pleasure to savages, and their music is to us in most cases hideous and unmeaning." (Darwin, Charles. (2008). *The Origin of Species*, vol. 2, edited by Gillian Beer, Oxford University Press, Oxford. p. 288). And Philip Ball mentiones: "*We know of societies without writing, and even without visual art – but none, it seems, lack some form of music*." (Ball, P. (2010). *The music instinct: How music works and why we can't do without it*. Oxford University Press, Oxford. p. 2)

[297]Idem, p. 5

[298] Pinker, S. (1998). *How the Mind Works*, The Penguin Press, London. p. 528

[299]Idem, p. 534

[300]Carroll, J. (1998). Steven Pinker's Cheesecake for the Mind, în *Philosophy and Literature*, vol. 22, pp. 478-485. p. 65

experience would have artificially imposed on them a deficiency similar to that imposed on autistic children through an innate neurological defect."[301]

Whether or not we exaggerate the role of music in human development (at a phylogenetic level), it is certain that music is part of the evolutionary program, offering advantages in various aspects. Beyond emotions, music also has its own semantics (like any language). Listening to and learning music gives us access to a way of perceiving, coding, and expressing the world.

3. Results

By accessing its various levels – from the superficial, involving naïve listening for relaxation or stimulation, to the profound, where its complex code is revealed to those with musical training – music provides a mechanism for development, reinforcement, and improvement in various human faculties. These include language, cognitive and intellectual processes, and socio-emotional aspects, all conditioned by the brain's mode of functioning through the arts, including music.

This is evidenced in the field of neuroscience, as summarized by Tatyana Chernigovskaya: "Neurophysiological methods have shown that music – whether performing it or simply listening – improves the brain: the quantity (and quality) of gray matter increases, genes responsible for dopaminergic neurotransmission, motor activity, learning, and memory are activated."[302]

A. Language Development

The connection between music and language is widely acknowledged and does not require exhaustive demonstration. As some researchers note: "Music is a time-related variation of sequences of sounds, as is spoken language."[303] In essence, music operates with mechanisms similar to language: sequential organization of sounds, hierarchical structure (akin to phonemes, morphemes, and lexemes), and syntagmatic ordering (comparable to sentence structure). Paralinguistic elements like tone, rhythm, and pauses are also shared between music and language.

Developing phonemic awareness, the ability to distinguish, divide, and recognize sounds and intonations, is achieved through songs. Memory development through music prepares children for reading, writing, and understanding complex sentences. Are Brean and Geir Olve Skeie argue: "Music may have been important in the development of language. Even newborns recognize and discriminate between different rhythms, intervals, and sequences of tones. They can pick out acoustic characteristics of voices and the melodic patterns of languages (prosody). Young children use the musical route into communication by language."[304]

Language-based communication, compared to musical communication, often limits access to sound nuances. Before acquiring the phonemes of their native language, children can detect subtle sounds, which later become inaccessible as their phonological system solidifies. In this sense, music and dance help maintain creative

[301]Carroll, J.,op. cit., p. 66
[302]Черниговская, Т. В. (2015). Фуэте, фонема, формула, фотон: языки мозга и культуры, în *Труды отделения историко-филологических наук РАН*, vol. 179, pp. 179-189. p. 185
[303]Brean, A., Skeie, G.O. (2019). *Music and the brain: About music's magical powers and its fantastic effect on the brain*. Cappelen Damm. p. 6
[304]Idem, p. 4

and cognitive potential.[305] Although early exposure to music fosters language development in children, its benefits extend throughout life. Music continues to develop and reinforce linguistic competencies. Tatyana Chernigovskaya notes that analyzing complex musical chords involves the same brain regions responsible for processing complex syntax. A study on symphony orchestra musicians showed significant development in Broca's area, typically associated with phonemic processing.[306] Thus, music (specifically methods logorhythmic[307]or meloherapy[308]) can enhance speech therapy programs for children with speech disorders or aid in the rehabilitation of adults with aphasia.

B. Enhancing Cognitive and Intellectual Processes

Neuroimaging techniques, both structural and functional, have revealed music's impact on brain development and functionality. Unlike language activities, which are localized to specific brain areas, music engages the entire brain, creating an optimal working state. Philip Ball writes: "When we listen to music, all the lights are apt to come on at once. Pretty much the whole brain may become active. Unlike language, music has no dedicated mental circuitry localized in one or a few particular areas; it is a 'whole brain' phenomenon. This shows why music is so fundamentally important: no other stimulus comparably engages all aspects of our mental apparatus and compels them to communicate with one another: left to right hemisphere, logic to emotion. It is, quite simply, a gymnasium for the mind."[309]

Therefore, neglecting or delaying musical training means missing the opportunity to refine the brain's potential, which would otherwise benefit from advantages in cognitive, social, and emotional development. Music's therapeutic potential is also widely recognized in addressing various disorders. Studies from Romania, England, Scotland, and Ireland, compiled in the volume *Terapia prin Muzică în România, Teorie și Practică, Prezent și Viitor*[310], highlight the practical application of music therapy for fostering emotional, cognitive, and social development in children and adults.

Experiments (conducted on twins[311] or groups of children and adults[312]) have shown that music stimulates intellectual activity, boosts academic performance, and enhances cognitive processes. For instance, playing a musical instrument develops concentration, memory, and the ability to shift focus between tasks (from reading

[305]Черниговская, p. 186

[306]Ibidem

[307]See, for example, Olărescu, V., Ponomari, D. (2019). *Logoritmica*. Tipografia „Pulsul pieței", Chișinău; Белякова, Л. И. (Ed.). (2017). *Логоритмика: Технология развития моторного и речевого ритмов у детей с нарушениями речи: Учебно-методическое пособие*. Национальный книжный центр, Москва; Шашкина, Г. Р. (2005). *Логопедическая ритмика для дошкольников с нарушениями речи: Учебное пособие для студентов высших педагогических учебных заведений*. Издательский центр «Академия», Москва.

[308]Pașca, M. D., Banga, E. (2016). *Terapii ocupaționale și arte combinate: Repere creative*. University Press, Târgu-Mureș.; Cohen, N.S. (1994). Speech and song: Implications for therapy, în *Music Therapy Perspectives*, vol. 12(1), pp. 8-14

[309]Ball, P. (2010). *The music instinct: How music works and why we can't do without it*. Oxford University Press, Oxford. p. 241

[310]Hulin, H., Pata, M. (Eds.). (2016). *Terapia prin Muzică în România, Teorie și Practică, Prezent și Viitor: E-book*. Music as Therapy International

[311]Balbag, M. A., Pedersen, N. L., Gatz, M. (2014). Playing a musical instrument as a protective factor against dementia and cognitive impairment: A population-based twin study, în *International Journal of Alzheimer's Disease*, vol. 2014

[312]Roden, I., Kreutz, G., Bongard, S. (2012). Effects of a school-based instrumental music program on verbal and visual memory in primary school children: A longitudinal study, în *Frontiers in Psychology*, vol. 3

notes to playing the instrument, synchronizing rhythm with others, or following an instructor) programming and perseverance (at the end of the play, especially important for children), spatial orientation.

Permiakova M.E. and Tkachenko E.S. describe this process: "Learning to play a musical instrument simultaneously develops most sensory functions (visual, auditory, tactile) and motor skills, stimulating the formation of active connections between them. For example, playing the piano helps develop eye muscles, expand the visual field, increase reaction speed to visual stimuli, and quickly adapt spatially, as children must cover the entire keyboard with their gaze, constantly keep the music sheet in view, and orient themselves instantly. Simultaneously, they must coordinate the movements of both hands, produce sounds of varying durations and intensities, and monitor correctness through auditory feedback."[313]

We note that musical training is not age-restricted. By around 18 weeks of gestation, the auditory canal is formed, and by 21-23 weeks, the fetus can hear and react to sound stimuli. This explains why newborns' cries reflect the prosodic elements of the language they are exposed to in the womb. For example, French babies cry with ascending intonation, while German babies cry with descending intonation[314]. Moreover, the benefits of early musical education continue throughout life. This type of training develops brain plasticity, forming synapses that function even in old age, when the brain diminishes this capacity, with beneficial effects observed, according to a study,[315] in age groups 60-80 years old. By optimizing brain activity and cognitive processes, music becomes a therapeutic tool for children with learning difficulties. Similarly, music improves attention, perseverance, and focus (especially on details), helping children with ADHD and hyperactivity complete tasks effectively.

C. Socio-Emotional Development

There are even more skeptical studies[316] that question music's role in cognitive and intellectual development acknowledge its benefits for socio-emotional growth. For instance, one study found that 11 out of 17 experiments highlighted a significant advantage for musicians in recognizing emotions in vocal stimuli. Mothers around the world sing to their babies, with the main goal of emotional regulation. There are laboratory studies that explore the consequences of singing on babies' emotional regulation[317]. And research in Romanian[318] is constantly being carried out. We note that today technology and research in the fields of psychology, medicine, and cognitive sciences in general are developing rapidly, with some hypotheses being supported by evidence, while others require concretization and nuances, so as not to fuel pseudoscientific aspects. Musical training or music-based techniques must be

[313] Пермякова, М. Е., Ткаченко, Е. С. (2016). Влияние занятий музыкой на когнитивное развитие детей младшего школьного возраста, în *Образование и наука*, vol. 4 (133), pp. 155-170. p. 158

[314] Brean, op. cit.

[315] Hanna-Pladdy, B., MacKay, A. (2011). The relation between instrumental musical activity and cognitive aging, în *Neuropsychology*, vol. 25 (3), pp. 378-386

[316] Villanueva, J., Ilari, B., Habibi, A. (2024). Long-term music instruction is partially associated with the development of socioemotional skills, PLoS ONE 1(7)

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[318] Trehub, S. E., Ghazban, N., Corbeil, M. (2015). Musical affect regulation in infancy, in *Annals of the New York Academy of Sciences*, vol. 1337(1), pp. 186-192

reasonably integrated, and not exclusively.

4. Conslusions

Art forms, particularly music, have been used since ancient times for healing and fostering the harmonious development of individuals. Modern studies on the human brain have demonstrated that art facilitates the creation of new neural connections, enhancing cognitive skills and memory. Furthermore, according to neurobiologist Tatyana Chernigovskaya, interaction with art enables the brain to function in a more productive state. She also emphasizes that musical training boosts brain activity in the long term, increasing neuroplasticity and creating unique neural configurations. Early exposure to art, even during the prenatal stage, offers undeniable advantages for children and humanity, especially in today's world, where passive and unproductive activities (mainly in the digital realm) have become widespread.

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