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## Music and Cognitive Development: An Interlocked Nexus

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**Abstract:** *This study explores the profound impact of music on human development, emphasizing its role as a universal language that transcends cultural barriers. Highlighting the early stages of human life, we have discussed how infants perceive and understand sounds even before birth, laying the foundation for musical appreciation. Understanding the concept of musical intelligence, as proposed by Gardner, we have advocated for the inclusion of musical education in school curricula to nurture and develop this ability in young minds. The study also acknowledges the nature versus nurture debate, recognizing that both innate abilities and environmental factors contribute to musical expertise. Our findings emphasize the need for a supportive and accessible musical environment, free from socioeconomic constraints, to foster children's musical development.*

**Keywords:** *music, cognitive development, Piaget's Theory, musicality, communication, comprehension, expertise, natural talent, infants, babies, social factor, environmental factor, intelligence, education, practice, professionalism, auditory senses, cortical activation, cultural interaction.*

### 1. Introduction

Plato said it best; "Music gives a soul to the universe, wings to the mind, flight to the imagination, and life to everything." Where music was Duke Orsino's "Food of Love", it became Maya Angelou's refuge, where she could crawl into the space between the notes and curl her back to loneliness. Where music became the wine that filled Robert Fripp's cup of

silence, Jane Austen made sure that Emma's life would be a blank without music. But Plato said it best. Music is the soul of the universe, the tongue of the birds, the chatter of the rains, the roar of the ocean tides, and the melodic cooing of an infant child. It gives life to everything.

The salient role that music has played in embodying the human species since the very beginning is worth the applause. The concept of musicality in the time of our ancestors, and, in today's day and age has rapidly become one of the most expressive forms of art, especially among the youth who construct an intimate bond with it to communicate their emotive feelings when courage and nerve fail them. These musical notes have guided our past, be it the communication tool the Australian Aboriginal Pintupi people used or the rock gongs of the early hominids, and they gradually followed humans as they evolved into linguistic beings with differing dialects, and rearranged themselves too to completely merge with humankind.

### **1.1. Research Objective:**

Understanding the close link between music and auditory sounds in line with human development

### **1.2. Research question:**

How is cognitive development impacted by musical exposure, and what are the adverse impacts of the absence of this expertise?

## **2. Literature Review**

### **2.1. Piaget's Theory of Cognitive Development**

This study delves into how perceiving, understanding, comprehending, and communicating sounds is every infant's ability before they even enter this world. Following Piaget's theory of cognitive development, sensory development is the first developmental stage of human life. From the first days of their life, one begins to recognize and interpret miscellaneous sounds and consequently starts understanding the structure of music unconsciously. This theory is also indicative of the fact that musical learning occurs across both formal and informal texts. Hence, musical understanding is inculcated in one's life from the very beginning which later plays a vital role in musical expertise once one begins „deliberate practice“. The auditory system in fetuses has the strongest response to stimulation of any sense system (Hepper, 1992). Around 20 weeks after being conceived, the cochlea's auditory cortex starts to process sounds that are connected to motor responses to noises. The developing baby eventually gains adult-level perception of spectral frequency, discrimination of harmonics and rapid sequences of events, preservation and recognition of pitch-time patterns, and all of these abilities by the time it is born. It is through the prenatal conditioning processes of the social structure, environmental norms, and later parental upbringing that shape the very persona of a child's point of view towards musicality as a form of social behavior. And once that child learns to articulate words, is when the core of performance transpires.

**2.2. Gardener's Theory of Multiple Intelligence** Gardener's theory of multiple intelligence categorizes music as one of the nine forms of intelligence, though critics believe otherwise. However, Gardener's claims suggested that the aptitude to formulate and admire rhythm, pitch, and timbre or an appreciation of musical expressiveness in its many different forms is inherently what constitutes musical intelligence. He further theorized that educational reform must adhere to inculcating the concept of musicality as an imperative subject that must be taught to all students with the premise that intelligence can be educated or developed through schooling and learning.

Research shows that high school and conservatory musicians of greater skill, score higher on tests of general intelligence and music audition (mentally hearing and understanding music in the absence of physical sound), and report more accumulated practice time than those of less skill, therefore proving that although practice plays a prime role in musical aptitude, natural talent, and other factors or pre-existing resources, environmental and social conditions, along with other factors play a vital role too as discussed in the Differentiated Model of Musical Giftedness and Talent.

### **2.3. Nature V/S Nurture**

To understand this model, it is necessary to shed light upon the nature versus nurture debate which predominantly governs the ability of an individual or an infant to even acquire musical abilities in the first place. A child may inherit his father's athletic genes, his mother's brown hair, his grandfather's green eyes, or his aunt's pink lips which all originate as his natural characteristics. But if unfortunately, the infant is brought into a world of economic disparity and financial hardships, constrained social relationships, and conservative mindsets all pile up to barricade that infant's musical potential. The impacts that early environment may have on the development of that child is too strong of an opponent against the child's natural capabilities. Whilst it is true, that natural giftedness gives certain individuals an unfair advantage of securing a position as one of the top 10% in their chosen fields as opposed to those who systematically develop their abilities with the aid of the social, environmental, and cultural factors that surrounded them. Duly noting the Pygmalion effect in this case, where a person becomes that which they surround themselves with, is primarily what musical expertise depends on. Comprehending, implementing, and simultaneously creating the art of music in an individual not as actively involved with music will not uphold the same level of professionalism as someone who has been persistently practicing since they were young children. And that is solely due to the musical constructivism that such individuals develop over time as they engage more and more with their instruments. The notion of cortical activation suggests that one understands music by simply listening to it suggesting that, unconsciously from a very young age, a child begins to further develop their sense of music or auditory senses which evolve into forming the pedestal of musical expertise later on in life. Musical senses develop in the human mind even through daily interactions with others, which leads this analysis to how one could implement this in their daily lives.

### 3. Conclusion

It is understood that musical thought processes are evoked from the prenatal age, marking children as the most intelligent beings in musical intelligence which ultimately begins the growth of their cognitive development. Unfortunately, one key obstacle that is often overlooked is the rapid capitalization of the music industry and how the higher class continues to govern its resources and outputs for its intents and purposes. Although musical learning does not require a prodigious amount of monetary funds, it is still mandatory for learners to first grasp an interest in it, and then be motivated enough to continue. They must also be free of external stresses which may otherwise affect their musical output. The financial situation of the child's family coupled with the social or cultural restraints that may have a strong grasp upon the child and similar factors must be kept in mind when psychologists like Howard Gardner classify music as a form of intelligence that must govern modern educational reforms. Allocating budgets to schools for the sole purpose of developing students' musical insight must be led first by training educators to understand the vitality of the role music plays in children's cognitive development. After deeply contemplating all these factors and understanding the significance of the musical exposure that infants must have, one can practicalize the analogy of this study by ensuring that all the children involved in each of their respective lives, develop a positive approach toward cortical activation which could promise its development into daily practice resulting in musical prowess.

These infants that enter our world every day are the future of this universe. The cycle of life does not stop with this generation and we must create a safe, approachable, and amenable environment for our children to learn in. The stigma revolving around musical education must be stripped away from society as it hinders children's thought processes and cognitive development. Because at the end of the day, it is the cosmos that gave us this soul, and thus it is our responsibility to pass it down to our progeny, or else tomorrow might as well cease to exist. Music feeds our souls. It gives life to everything.

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