Investigating into Music Instruction and Cognitive Development in Young Children

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ABSTRACT

Music is a language of learning that eventually involves children in talking, reading, drawing, and writing. Music instruction has repeatedly been claimed to positively impact the cognitive skills development of children. This claim relies on the assumption that engaging in intellectually demanding activities fosters particular domain-general cognitive skills, or even general intelligence. In relation to cognitive development, it is seen as the emergence of the ability to consciously cognize, understand, and articulate understanding in adult terms. And it also seen as the way people perceive, think, and gain understanding of their world through the relations of genetic and learning factor. That is why the study is carried to investigate into Music Instruction and Cognitive Development in Young Children. Thus, the review concluded that music instruction positively impacts the cognitive development of a child either by music exposure, or in-school music education. One of the recommendations was that government should setup a sustainable collaboration between music educators and early childhood professionals in building the successful cognitive development of a young children.

KEYWORDS: Music Instruction, Cognitive Development and Young Children

Introduction

Music can be found in every culture all around the world. It has become such a big part of our lives. Even though the ancient cultures were widely aware of the comprehensive benefits of music, it was only with the emergence of the contemporary neuroscience, that those benefits were ultimately recognized by larger audiences (Zadnik and Habe, 2017). In the last decades, music has become a window for studying higher brain functions' processing and, on the other hand, a means of enhancing optimal brain functioning. And this have moved many researchers to study how music affects people, especially children (Chau and Riforgiate, 2010). Many parents, teachers, scholars, and businesses are interested in learning more about the influence of music on the development of children. Others focus on how formal music training impacts various aspects of cognitive development such as perception, memory, and language skills (Moreno, Marques, Santos, Santos, Castro and Besson, 2009). It has been claimed that music nurtures children's cognitive skills (Sala and Gobet, 2020). Learning to play the violin or the piano, to recognize pitches, and to keep the beat are often presented as effective cognitive enhancement tools

(Jaušovec & Pahor, 2017). However, it has been demonstrated, through varied use of music that people benefit from music's impact on both hemispheres of the brain, which make learning easier (Nicolich, 2008).

CONCEPTUAL REVIEW

Concept of Cognitive Development

Cognitive development is a field of study in neuroscience and psychology focusing on a child's development in terms of information processing, conceptual resources, perceptual skill, language learning, and other aspects of the developed adult brain and cognitive psychology (Sellers, Machluf and Bjorklund, 2018). According to Gauvain and Richert (2016), cognitive development is the process by which human beings acquire, organize, and learn to use knowledge. Also, Haddad, Doherty and Purtilo (2019) viewed cognitive development as a way of addressing the way a child learns to think, reason, and use language, which are vital to the child's overall growth and development. A Qualitative difference between how a child processes their waking experience and how an adult processes their waking experience are acknowledged (Such as object permanence, the understanding of logical relations, and cause-effect reasoning in school-age children). Hence, Cognitive development is defined as the emergence of the ability to consciously cognize, understand, and articulate understanding in adult terms. Cognitive development is how a person perceives, thinks, and gains understanding of their world through the relations of genetic and learning factor (Sellers, et. al., 2018). There are four stages to cognitive information development. They are, reasoning, intelligence, language, and memory. These stages start when the baby is about 18 months old, they play with toys, listen to their parents speak, they watch TV, anything that catches their attention helps build their cognitive development (Wikipedia, 2017).

Concept of Music Instruction

Music instruction has repeatedly been claimed to positively impact cognitive skills development of children (Sala and Gobet, 2020). This claim relies on the assumption that engaging in intellectually demanding activities fosters particular domain-general cognitive skills, or even general intelligence. Research on the benefits of music instruction has budded over that past decades. Music instruction is quantity and quality of teacher supply (Wong, 2010). Though parents usually have high expectations of music education for their children, the *status quo* of music teacher education may not satisfy their expectation. Thus, when parents are able to provide their children with private one on one formal lessons, the music instruction can improve children's verbal memory (Ho, Cheung, and Chan, 2003). The availability of music instruction in many public schools, has struggled to remain relevant in today's test-focused curriculum. While 89-97% of elementary students according to Parsad and Spiegelman, (2012) receive some kind of music instruction in school, the type and quality of instruction varies widely. Thus, Folkestad (2006) noted that a highly legitimate motive for the use of informal teaching strategies is to increase students' engagement with and motivation for music instruction in school (Green, 2008).

Music Instruction and Cognitive Development in Young Children

Music instruction appears to accelerate brain development in young children (News Medical Life Sciences, 2016), particularly in the areas of the brain that are responsible for processing sound, language development, speech perception and reading skills. Salmon (2010) looks at how using music instrument can promote thinking and increase literacy skills. "Music is inherent to children's experiences and is related to sounds heard every day, which facilitate mental imagery. Music is a language of learning that eventually involves children in talking, reading, drawing, and writing" (Salmon, 2010). Studies on intelligence, academic success, and cognitive skills have documented the value of music instruction in the lives of children. Norton, Winner, Cronin, Overy, Lee, and Schlaug (2005) conducted a study to know if there are pre-existing neural, cognitive, or motoric markers for musical ability. Their results showed no correlations between music perceptual skills and any brain or visual-spatial measures. They did find, however, correlations between music perceptual skills and both non-verbal reasoning and phonemic awareness. Another study conducted by Gromko (2005) showed that children who receive musical training will develop aural skills for spoken sounds and spoken words faster than children who did not receive musical instruction. Moreover, Franklin, Moore, Yip, Jonides, Rattray and Moher (2008) found evidence for greater verbal working memory span in musicians than non-musicians.

In recent years, literature reviews have been written to summarize the effects of music instruction on various emergent literacy capacities among preschool children (Bolduc, 2008; O'Herron and Siebenaler, 2007). Bolduc (2008) analyzed five correlational studies and eight quasi-experimental studies in the fields of music therapy and music education. He concluded that music instruction promotes the development of three important components associated with language development: auditory processing, phonological memory, and metacognitive knowledge. O'Herron and Siebenaler (2007), on the other hand, examined the interaction of vocal skill development and early literacy instruction with the goal of providing early childhood teachers practical strategies to enhance auditory processing and quality of speech. They concluded that parallels exist between vocal music instruction and language arts instruction. Specifically, auditory processing, articulation, and prosody might be necessary in the development of phonemic awareness and fluency, as well as music skill development.

Music Instruction Boosts Brain Growth & Academic Results

For a long time, music educators have suggested that music, either in the form of music instruction, music practice, or exposure to music, can have a significant impact on school achievement, school attendance rates and students' conduct, both in elementary and secondary education (Koopman, 2005; Waller, 2007). Educational scientists have addressed the question of what effects music instruction can have on child development from a research point of view. Some researchers claim to have found effects on cognitive growth, such as the increase of the ability to concentrate and academic achievement. Also effects in the social and emotional domain have been reported (Gardner, 2004). According to Bradley-Kramer (2017), high quality music instruction promotes rapid cognitive development in children. Music instruction raises the IQ level in children by around 7.5 points, or close to 20%, and that musical training is associated with higher scores in both math and language tests. But recent findings in brain scans and neuroscience underline just

how profound these benefits are to a child's rapidly developing neural networks. From a large-scale longitudinal study Bastian (2002) arrived at the conclusion to have identified a significant improvement of social competencies, an increase of motivation to learn, a significant improvement of IQ, and the ability to concentrate as a result of enhanced music instruction, consisting of playing Orff-instruments, recorder lessons, lessons on other musical instruments, and special music projects (Hogenesa, van Oersb and Diekstrac, 2014).

Cognitive, Emotional and Social Functions of Music Perception

Listening to music requires certain perceptual abilities, including pitch discrimination, auditory memory, and selective attention in order to perceive the temporal and harmonic structure of the music as well as its affective components, and engages a distributed network of brain structures (Peretz and Zatorre, 2005). Music, like all sounds, unfolds over time. Thus, the auditory cognitive system must depend on working memory mechanisms that allow a stimulus to be maintained on-line to be able to relate one element in a sequence to another that occurs later. The process of music recognition requires access and selection of potential predictions in a perceptual memory system (Dalla Bella, Peretz and Aronoff, 2003; Peretz and Zatorre, 2005). Additionally, music is also known to have a powerful emotional impact. Neuroimaging studies have shown that musically induced emotions involve very similar brain regions that are also implicated in non-musical basic emotions, such as the reward system, insula, and orbitofrontal cortex, amygdala and hippocampus (Blood and Zatorre, 2001; Koelsch, Fritz, Cramon., Muller and Friederici, 2006; Salimpoor, Benovoy, Larcher, Dagher and Zatorre, 2011; Trost, Ethofer., Zentner and Vuilleumier, 2012). However, music can have a strong influence on the emotion of the listener as well as the performer: musical engagement can be experienced as highly emotional not only as in the case of stage fright (Studer, Gomez, Hildebrandt, Arial and Danuser, 2011) but also as highly rewarding (de Manzano, Theorell, Harmat and Ullen, 2010; Nakahara, Furuya, Masuko, Francis and Kinoshita, 2011).

In a social context, making music in a group has been suggested to increase communication, coordination, cooperation and even empathy between in-group members (Koelsch, 2010). Therefore, it could easily be conceived how musical training could have a positive impact on the well-being and social development of children and adults. Instrumental training is a multisensory motor experience, typically initiated at an early age. Playing an instrument requires a host of skills, including reading a complex symbolic system (musical notation) and translating it into sequential, bimanual motor activity dependent on multisensory feedback; developing fine motor skills coupled with metric precision; memorizing long musical passages; and improvising within given musical parameters. Music performance, unlike most other motor activities, requires precise timing of several hierarchically organized actions and control over pitch interval production (Zatorre, Chen and Penhune, 2007).

Conclusion

The review of the literature warrants the conclusion, that music instruction positively impacts the cognitive development of a child either by music exposure, or in-school music

education. Cognitive development is seen as the process by which human beings acquire, organize, and learn to use knowledge. Also, it is a way of addressing how children learn to think, reason, and use language, which are vital to the child's overall growth and development. In other words, music instruction is quantity and quality of teaching supply to a child's development. Music instruction accelerate the brain development in young children and have a positive effect on cognitive growth, such as the increase of the ability to concentrate and academic achievement of a child.

Recommendations

1. Government should setup a sustainable collaboration between music educators and early childhood professionals, to build a successful cognitive development of the young children.

2. Government in collaboration with educational management should create a model of professional's developers that will work in a variety of settings and contexts in improving early musical experience for all young children.

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