



## MUSIC: A PEDAGOGICAL TOOL FOR THE COGNITIVE DEVELOPMENT OF AUTISTIC CHILDREN

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### ABSTRACT

Children with autism experience qualitative differences in social interaction, functional communication, and linguistic difficulties. They suffer from inadequate supply of words and responsive communicative skills. This impairment in social cognition makes them reluctant and mentally passive towards communication with the outside world, and hence they deem isolation as their preferred survival mechanism. Previous researches have revealed that, autistic children respond positively towards music and perform exceptionally well towards musical activities. Music could thus be used as an innovative pedagogical tool in the cognitive development process of autistic children, and it could also initiate and encourage their accommodation in normal academic institutions which would promote inclusive education. Music as a pedagogical tool nurtures diverse cognitive resources such as visual-spatial processing, memory, motor programming, auditory and verbal processing. Therefore, it could be utilized as a stimulus to analyze and develop the various cognitive skills of the children suffering from autism. The present study intends to experimentally demonstrate the impact and level of influence of music towards the internal cognitive development of the autistic children, and also, to explore the use of music as an effective tool towards the enhancement of their social cognition, and to augment their social presence.

**KEYWORDS:** Autism, music, social cognition, pedagogical tool, verbal communication .

### INTRODUCTION

Kanner (1943) identified autism as a neuro-developmental disorder characterized by social interaction and functional communication problems with restricted interests and behaviors. (American Psychiatric Association, 1994). Children with autism suffers from communication problems, both verbal (due to lack of language skills) and non-verbal (like inappropriate gestures, eye contact, facial expressions, etc.). Children with autism confine themselves in a world of their own which may be not due to lack of interest but due to lack of language skills. (Communication problems in Children with Autism Spectrum Disorder, www.nidcd.nih.gov). Deficit in social cognition has been a major feature of children suffering from autism. However, researches reveal that children with autism possess non-social cognitive impairments in representational understanding, attention allocation and sensory processing. (Leekam, 2015) .Children with autism are very much inclined to music. They possess exceptional qualities in music and they respond positively to music. (Mottron, et al., 2000). Extant researches have been conducted on human cognition which reveals that music helps in the development of higher order motor and cognitive regions of human brain. (Wan C., et al., 2010). This study reinforce the need to use music as an effective stimulus of interest in developing the cognition of children with Autism Spectrum Disorder.

## SOCIAL COGNITION AND AUTISM

Bandura (1977) in his social cognitive theory proposed that, human learning occurs from social influence, both internal and external. The influence of personal, behavioral and environmental factors helps an individual to acquire, maintain and perform a behavior. Social cognition involves reception of a stimulus, its perception and evaluation or response (positive/ negative). The response or performance depends upon the external or internal social influence which acts as a reinforcement in the whole process. (Bandura, 1986). Social cognition refers to perception of information (social) by giving attention followed by decision making. Autism spectrum disorder (ASD) is a neuro-developmental disorder where children lack in communicative skills (American Psychiatric Association (1994). Children with autism are characterized by different symptoms and they vary widely from each other. However, their common features include difficulty in expressing emotions, forming and maintaining relationships, difficulty in verbal communication (due to difficulty in acquisition of language skills), difficulty in non-verbal communication (like inappropriate gestures, facial expressions, lack of eye contact, etc.) and repetitive behavior. Deficiency in exhibition of social gestures like nodding head to others, greeting others by waving hands are most common in children suffering from autism. According to Romanczyk et al. (1999), children with autism also possess mental retardation and their level of retardation also determines their uneven skill development. (Patil, and Ramachandran, 2014).

Autism is primarily a behavioural problem and lacks in the development of social cognition. Empathy, here, plays a key role to develop social cognition. Impairments in emotion understanding and emotion regulation, withdrawal from social group leads to self centeredness which form the main feature of children with autism. (Decety, 2010). Duijkers et al. (2014) in their study Social disorders have discussed on children with autism suffering from impairments in emotion regulation. They mentioned the need of social perception along with self perception in order to perform normal social behaviour and daily functions. This study emphasizes on improving social behaviour of the children with autism by processing a stimulus, its proper perception, recognition and evaluation that develops the social cognition, emotion and motivation. From the above review of research works on social cognition and autism, it is clear that the children suffering from Autism Spectrum Disorder lacks in social cognition. As children with autism differ from each other in their level of impairment and characteristics, steps should be taken to help them conquer their deficiencies in social interaction, keeping their variety of limitations in mind.

### Proposition: 1

The present study proposes to initiate the identification and implementation of innovative methods and pedagogical tools and understand their influence towards the development of the children with autism.

### Attention, interest, motivation and autism

The Theory of Mind highlights the lack of attention and irregularity of attention in children with autism. This results in deficits of social and communicative skills in autism (Baron-Cohen et al., 1996). Extant research has been conducted to find the way of generating attention to the children with autism which will lead to the first step of social cognition. Researches reveal that interest act as a source of motivation which helps us to perform various functions. (Sansone and Thoman, 2005). Though motivation is abstract in nature and differs from person to person, even between individuals and change in due course of time, interest and motivation may lead to developed attention in children with autism. Children with autism possess deficiency in goal directed executive functions like planning, sustaining attention, working memory, organizing, solving problems and execution of the work (Marshall and David, 2011). According to Bertone et al. (2005), engagement in social behaviours and functions can be increased or encouraged by implementing proper stimulus to the children with autism. Literature review on autism reveals that children with autism responds positively to auditory stimulus, music, and are often exceptionally talented in music. (Fang, 2009). Music, being a subject of interest is easier for the children with autism to express their feelings and emotions where words fail to reach. It will motivate the children to participate in various social functions and participate in group activities. (Fang, 2009).

Educational psychology is perhaps the largest field of study that nurtures theories of interests and emphasizes both cognitive and emotional aspects of interests.

### **Proposition: 2**

This study intends to propose that music as an interactive tool would be effective in the development of the cognitive functioning of the children with autism, and would lead to better understanding of the interests within the ASD children.

### **Music in cognitive development**

The obvious question that arises after taking two words 'music' and 'cognition' together is how they are related. Music is however very much related to our daily lives and played an important role in human evolution. Music and cognition are thus intensely related. Most importantly, the perception, cognition and emotion sides of human behaviour get influenced by the cognitive processing of music. Music cognition helps in emotional processing, regulation of emotions and expression (Pearce and Rohrmeier, 2012).

Mottron, et al. (2000) have discussed that 'savant' autistic children have exceptional abilities in music and they have a special ability of absolute pitch that non savant children lacks. Researches have shown that children with autism have a special ability to detect pitch from musical tones which will encourage future research on using tonal pitch as a stimulus to enhance cognitive operations. Swaminathan and Schellenberg (2015), in their study, concluded that music induces emotions that listeners choose to hear. Variations in emotions like happiness and sadness are created by tonal pitch differentiation and not merely by rhythm or tempo (Khalifa et al., 2008). This tonal encoding of music is hypothesized to be a key factor for emotional perceptions of music. (Peretz, 2002).

Many children with ASD exhibit special skills like remembering the dates of a calendar with the names of days, naming all the film stars, etc. but fail to recall simple functional languages. This skill of rote memory has no functional use. Patil and Ramachandran, (2014) in their study have found that direct instruction accelerates motivation, concentration and involvement of children with autism in mathematics.

Music as a pedagogical tool nurtures diverse cognitive resources like visual-spatial processing, memory, motor programming, auditory and verbal processing (Boulanger, 2006). Musical elements like beats, rhythm, tempo possess mathematical principles, such as spatial properties, counting, sequencing, etc. These mathematical properties can be taught through the beats, rhythm, and tempo of music, naturally to children and without the formal mathematical sessions. This makes the study of mathematics more effective and interesting (Geist et al., 2012). This study seeks to explore an innovative method of using music as a pedagogical tool to acquire the mathematical properties.

According to Brownell (2002), the elements of social stories include simple functional information which helps to develop the skill of perception, attention and expression of a child with verbal and non-verbal impairment. Since the social stories are made according to the need of an individual, it focuses on grabbing the attention and concentration of the particular individual. They act as a reinforce in the whole process of expression. Experiments made by Eidson (1989), using music as a tool to interact with autism showed that they respond positively to music. Not only that, some research have proved that children with autism perform extremely well in music and their perfection of pitch is even better than normal kids. Storytelling through music helps the children with autism to recall the information within the song spontaneously and thus incorporate the information easily (Brownell, 2002).

### **Proposition: 3**

Music as a pedagogical tool would be imperative towards the understanding of emotion in children with autism, and would enhance the intrinsic capabilities of the instructor towards constructive comprehension of the underlying passive motivation of ASD children, since the latter imbibes abilities to differentiate tonal pitch from music, as also, they could be able to recognize the sensitivity of the spoken word through music.

**Proposition: 4**

This research intends to propose that, music could also be used to disseminate knowledge related to science and mathematics, through the varied utilization of simple “sargams”, an inherent constituent of classical music.

**METHODOLOGY**

Experimental settings would be utilized to study the behaviour of children with autism. Non Profit Government Organizations (NGOs), which has the expertise in the maintenance and tutelage of children with autism, and with considerable experience in terms of such developmental activities, would be contacted. A group of children with ASD would be identified based on the suggestions of the NGOs. The initial interactive behaviour of the children would be studied to document their actions, through the use of normal pedagogical tools. The children would then be exposed to musical chords, varied at different time periods, and their subsequent actions would be studied to observe the influence of music in any of their behavioural changes, as also, to notify the type of music that could possibly have a positive impact on their interactive process. The observation would be recorded in iterations, and over fixed time periods, and the findings would be coded to develop related themes, which would implore the factors which might necessitate use of music as a pedagogical tool, as also, would also propose the type of music to be utilized for the cognitive development of children with ASD.

**Inclusion of Children with Autism in normal schools**

As could be evident from the propositions, this study would be instrumental in the development of music as an innovative pedagogical tool, which could be deemed as essential and effective towards the intrinsic and extrinsic cognitive and social development of children with autism. Music could be used as an attractive audio stimulus within various classroom settings, since exposure to sensitive music might lead to the development of a coherent understanding process of extrinsic cues for the children with autism. It could be safely proposed that, the internal growth of the ASD children towards the rational interpretation of external cues, might eventually lead to their active, positive, and accurate discernment of the external societal cues in due course of time, which would enhance their self-confidence towards societal interaction. It might also lead to their being accepted in the social environment as normal beings, which could facilitate their admissions in normal schools, to be educated alongside normal children. Apparently, the adoption of innovative pedagogical tools such as music could in effect, is a potential catalyst towards the actual evolution and growth of inclusive education.

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#### WEBLINKS

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