Abstract

Child aggression in school has become a major concern since self-reported aggressive and violent behavior continues to rise among children and adolescents. One of the major reasons of such aggressive behavior is the poor use of emotions. Music therapy is one of the options for controlling aggression. The present investigation aims to enhance emotional intelligence and reduce aggression among adolescents through therapy by using Hindustani and Carnatic music. It was hypothesized that Post intervention aggression scores would be significantly less as compared to Pre intervention scores. It was also hypothesized that Post intervention emotional intelligence would be better as compared to Pre intervention scores and individuals in experimental group would score low on EMG as compared to individuals in control group. Two hundred ten (210) subjects, between the age group of 13 to 16 years of age, were selected with the help of Aggression Scale (Mathur, G.P. & Bhatnagar, R.K., 2004) and Emotional Intelligence Scale (Hyde, A., Pathe, S. & Dhar, U. 2002). These 210 subjects were randomly assigned to experimental groups and control groups. The experimental groups were given music therapy intervention for fifteen days. After intervention period, same scales were re-administered. In order to analyze the statistical data, ANOVA and MANOVA were applied to examine the effect of music therapy on Aggression,
Emotional Intelligence, and EMG. To determine the difference in the efficacy of Hindustani & Carnatic Music Therapy Intervention, t-test was applied. The results have shown that experimental groups were significantly higher on emotional intelligence in comparison to control group. Adolescents in experimental group showed significantly less aggressive tendencies as compared to those in control group. Results showed remarkable reduction in EMG scores after the intervention. Results showed no significant difference between the efficacies of Hindustani & Carnatic music. The research has concluded that music does have positive effects on the mind and brain of aggressive adolescents.

**Introduction**

Humans exhibit aggressive behavior on a regular basis. Children as young as preschoolers show aggressive behavior in form of explosive temper tantrums, physical aggression, fighting, threats or attempts to hurt self or others, use of weapons, cruelty toward animals, fire setting, intentional destruction of property and vandalism. Parents and other adults who witness the behavior may be concerned; however, they often hope that the young child will "grow out of it."

Freud’s (1964) has explained aggressive behavior as a death instinct (Thanatos), a reservoir of aggressive tendencies, which is aimed at self-destruction, but is redirected toward others. Lorenz (1976) proposed the existence of an inherited fighting instinct that ensures that the strongest survive. Heredity influences the neural systems sensitivity to aggressive cues. Serotonin is a chemical in the brain that may inhibit aggressive impulses (Bernhardt, 1997). Testosterone is a male sex hormone associated with aggression (Dabbs & Others, 1997; Harris, 1999). Berkowitz (1989) proposed that frustration leads to aggression because of a basic relationship between negative affect and aggressive behavior. Frustration-aggression hypothesis suggests that frustration is a very powerful determinant of aggression.

One of the major reasons of externalizing such behaviors is the poor use of emotions. Emotional intelligence is highly correlated with behavior problems, which includes identifying one’s own feelings as well as others’ and applying it to make wise decisions in the daily life. Daniel Goleman (1998) focuses on emotional intelligence as a wide array of competencies and skills that drive leadership performance. Salovey and Mayer's model claims that emotional intelligence includes abilities of perceiving, using, understanding and managing emotions.
Emotional and Social Intelligence is related differently to various forms of aggressive behavior. Emotions can be expressed and thus observed in many ways: through language, behavior and physiology. Before getting violent, everyone feels anger in his or her own way. Emotion is not a single response but a collection of these responses (M. M. Bradley & P. J. Lang, 2001).

When people experience emotions, their bodies act and react; they probably feel: Muscle tension, Accelerated heartbeat, a "knot" or "butterflies" in stomach, Changes in breathing, Trembling, Clenching fists, Voice sounds louder, Flushed in the face (M. M. Bradley, 2000). Emotions have been measured using self report scales, physiological measures, and behavioral measures. Among the physiological measures, EMG biofeedback has been used to index valence and to measure physiological arousal. Biofeedback is a process that enables an individual to learn how to change physiological activity for the purposes of improving health and performance.

Controlling aggressive behavior should be a part of children’s emotional socialization in both families and school (Piko BF, Keresztes N, Pluhar ZF 2006). Interventions for aggression and enhancement of emotional intelligence include behavioral techniques aimed at reducing impulsive behavior, such as anger management techniques, drama therapy, music therapy, art therapy and dance therapy (Smeijsters H, 2006).

Music therapy is one of option for controlling aggression. It is an incredibly powerful form of expression. While music as a whole is well recognized for its entertainment value, the Indian civilization had gone a step forward to attribute the curative aspect to music (Aurora, S. & Kaur, G, 2011). Music, based on ragas, has direct impact on the shat chakras hidden along the endocrine column and hence affects our physical as well as subtle bodies. Raga is the sequence of selected notes that lend appropriate mood or emotion in a selective combination. Depending on their nature, a raga could induce or intensify joy or sorrow, violence or peace. Playing, performing and even listening to appropriate ragas can work as a medicine (Bagchi, 2003). Various ragas have since been recognized to have definite impact on certain ailments. Some ragas like Darbari, Kanhada, Kamaj and Pooriya are found to help in defusing mental tension, particularly in the case of hysterics. For those who suffer from hypertension, ragas such as Ahirbhairav, Pooriya and Todi are prescribed. Carnatic ragas, Punnagavarali and Sahana can be used to bring down the violence within (Sairam, 2004b).
Music therapy is the prescribed use of music and musical interventions in order to restore, maintain, and improve emotional, physical, physiological, and spiritual health and well being. It is an efficacious and valid treatment for persons who have psychological, affective, cognitive and communicative needs (AMTA). It can be defined as the controlled use of music and its influence on the human being to aid in physiological, psychological and emotional integration of the individual during the treatment of an illness or disease (Munro S, Mount B. 1978).

Music therapy can be used in active and passive mode (Pacchetti C, Mancini F, Aglieri R, Fundaro C, Martignoni E, Nappi G. 2000). In active music therapy, the therapist and patient are actively involved in playing music using instruments and voice. Passive music therapy is conducted with the patient at rest. The therapist plays calming music and invites the patient to visualize peaceful images with the aim of producing a state of mental relaxation ((Pacchetti C, Mancini F, Aglieri R, Fundaro C, Martignoni E, Nappi G. 2000).

**Music Therapy, Aggression & Emotional intelligence**

Music therapy has been found that music provides opportunities for enhancing a sense of control over emotions through emotional catharsis (Lippin RA, Micozzi MS. Art’s therapy 2006; Wiesenthal DL, Hennessy DA, Totten B. 2003). When music enters the sensory system, it goes to the limbic system before passing it to the prefrontal cortex (Goleman, 1995). The limbic system is where the brain processes the emotion. These limbic-prefrontal circuitries can be enhanced through music program (Chalabi, Turner and Delamont, 2006), as music invokes emotions (Khalfa, Schon, Anton and Liégeois-Chauvel, 2005). It will not only improve learning and memory, but also emotional intelligence (Goleman, 1998). Therefore, the emotional state of the person may be improved by music (Campbell, 1997). Group music therapy can facilitate self-expression and provides a channel for transforming frustration, anger, and aggression into the experience of creativity and self-mastery (Montello, L.M., & Coons, E.E., 1998).

Several previous trials and reviews have determined that music therapy is beneficial for pain control (Hilliard RE, 2005; Kneafsey R. 1997; Krout RE 2001; O’Callaghan CC. 1996; Tsao JC, Zeltzer LK. 2005), reducing anxiety (Evans D. 2002; Kain ZN, et al. 2004), stress (Lindblad F, Hogmark A, Theorell 20074), anger and agitation (Sung HC, Chang AM 2005) and improving mood states (Saarikallio S, Erkkila J 2007). It is used as psychotherapy under certain conditions.
and in various populations (Koller D, Gryski C. 2007). Musical stimuli perceived by the individual as pleasant and relaxing may best enhance the physiological and psychological processes of relaxation (Davis & Thaut, 1989) as music decreases the frontalis muscle activity.

Indian classical music has two distinct styles having certain similarities and differences. Hindustani classical music is prevalent all over India except in the Southern States, whereas Carnatic music is practiced in the Southern States. Both the styles are monophonic, follow a melodic line, use definite scales to define a raga and employ a drone (tanpura) with the help of one or two notes against the melody, but they do differ on certain parameters. Carnatic music does not adhere to Time or Samay concepts Unlike Hindustani music, and it follows the Melakarta concept instead of Thaats. Studies in adults have found that music, irrespective of their nature, provides opportunities for enhancing a sense of control over emotions, especially aggression and anger, through emotional catharsis (Lippin RA, Micozzi MS, 2006; Wiesenthal DL, Hennessy DA, Totten B 2000, 2003).

Need of the Study

Violent or aggressive behavior in a child at any age always needs to be taken seriously. It should not be quickly dismissed as "just a phase they're going through!" Aggressive behavior may present a potential threat to psychosocial development in youth. This complex and troubling issue needs to be carefully understood by parents, teachers, and other adults. Different ragas have different effects in the listeners. Based on these findings, it is reasonable to assume that music intervention may reduce children’s aggression and enhance emotional intelligence by enabling good psychological health; however, no such study has been conducted on the effect of music on aggression control in adolescents taking into the account of distinct nature of Hindustani and Carnatic Music. The present study is designed to assess the comparative efficacy of Hindustani and Carnatic Music on psychological and physiological measures of adolescents. The study verified the following hypotheses:

Hypotheses:

1. Individuals in experimental group would exhibit less aggression as compared to individuals in control group. Post intervention aggression scores would be significantly less as compared to Pre intervention scores.
Individuals in experimental group would score high on emotional intelligence as compared to individuals in control group. Post intervention emotional intelligence would be better as compared to Pre intervention scores.

Individuals in experimental group would score low on EMG as compared to individuals in control group. Post intervention EMG scores would be better as compared to Pre intervention scores.

Aggressive adolescents would benefit more with Hindustani Music as compared to Carnatic Music

**Design:** Experimental-control group assessment design was adopted to examine the efficacy of Music Therapy on aggression, emotional intelligence, and EMG Biofeedback. Pre-Post intervention scores on aggression, emotional intelligence, and EMG Biofeedback were also compared with the help of t-test. A series of univariate ANOVAs with 2 levels of Intervention (experimental and control group) was applied to analyze the significance of difference between experimental and control group on aggression, emotional intelligence, and EMG Biofeedback. Further Multivariate Analysis Of Variance (MANOVA) was applied to analyze the significance of difference between experimental and control group collectively on aggression, emotional intelligence, and EMG Biofeedback.

**Sample:** A total of 550 adolescent boys, between the age group of 13 to 16 years of age, were randomly selected from various public schools (English medium) of Delhi and Chandigarh (North India); and Bangalore & Chennai (South India). Consent of the respective authorities and subjects was taken in advance.

**Procedure:** Out of total 550 students, 270 were screened in. The participants were those individuals who were screened in as “High Aggressive” but with low Emotional Intelligence identified with the help of Aggression Scale (Mathur, G.P. & Bhatnagar, R.K., 2004), and Emotional Intelligence Scale (Hyde, A., Pathe, S. & Dhar, U. 2002) respectively. Further, 225 subjects agreed to be a part of the intervention program which were then randomly assigned to experimental (Hindustani & Carnatic) and control group. Practically 210 subjects participated in the intervention program, which were further equally divided into three groups: 70 each in two experimental groups (Hindustani & Carnatic Music) and 70 in control group. Each
subgroup further divided into 7 groups as per their availability comprising of 9 or 10 participants. In this study, ‘Raga Sahana and Raga Punnagavarali” played upon flute by renowned musician Hari Prasad Chaurasia was used to evaluate the efficacy of Hindustani and Carnatic music therapy program respectively. The duration of each session was of 30-40 minutes for fifteen days as per the Campbell (1997) recommendation that the music as therapy should not be longer than 50-60 minutes because beyond that it becomes an attention catcher. The participants were seated in a semi-circle facing outwards so that they could not look at each other and were instructed to enjoy music through headphones till the music continued. Neutral or unrelated issues like study habits, time management & career selection were discussed with participants in control group. After fifteen days intervention, all the three scales were re-administered to the participants of both the groups. Pre-post intervention comparison for all the three variables was done, for both control and experimental group, to study the efficacy of music therapy by applying one way MANOVAs and a series of univariate ANOVAs.

**Tools Used:**
- Cassette player with head phones and Cassettes having half hour instrumental flute music in ‘Raga Sahana and Raga Punnagavarali played by renowned Indian Musician, Hari Parsad Chaurasia were used as a relaxation technique.
- EMG Biofeedback Apparatus

**RESULTS**

The results have been presented in Table 1.1 through Table 1.6.

**Table 1.1: Comparison of post intervention scores on Aggression, Emotional Intelligence and EMG**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Hindustani Music</th>
<th>Carnatic Music</th>
<th>Control Group</th>
<th>F (ANOVA)</th>
<th>F (MANOVA)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Means N SD</td>
<td>Means N SD</td>
<td>Means N SD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aggression</td>
<td>170.91 70 21.76</td>
<td>172.56 70 20.25</td>
<td>231.19 70 24.34</td>
<td>167.72**</td>
<td>135.074**</td>
</tr>
</tbody>
</table>
Table 1.2: ANOVA Summary for the effect of Intervention (HM, CM and Control Group) on Aggression, Emotional Intelligence and EMG

<table>
<thead>
<tr>
<th>Variables</th>
<th>Variance</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aggression</td>
<td>Between Groups</td>
<td>165028.58</td>
<td>2</td>
<td>82514.29</td>
<td>167.72**</td>
</tr>
<tr>
<td></td>
<td>Within Groups</td>
<td>101839.34</td>
<td>207</td>
<td>491.97</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>266867.92</td>
<td>209</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EI</td>
<td>Between Groups</td>
<td>76420.11</td>
<td>2</td>
<td>38210.05</td>
<td>545.44**</td>
</tr>
<tr>
<td></td>
<td>Within Groups</td>
<td>14501.14</td>
<td>207</td>
<td>70.05</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>90921.25</td>
<td>209</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EMG</td>
<td>Between Groups</td>
<td>158844.527</td>
<td>2</td>
<td>79422.263</td>
<td>764.39**</td>
</tr>
<tr>
<td></td>
<td>Within Groups</td>
<td>21507.906</td>
<td>207</td>
<td>103.903</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>180352.433</td>
<td>209</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

** Significant at .01 level

Table 1.2 is depicting Means and Standard Deviations of Control & Experimental Group obtained on Aggression, Emotional Intelligence and EMG with F-Ratios. The difference between control group and experimental group on all the measures is found to be statistically significant proving effectiveness of music therapy intervention in reducing aggression and muscular tension and enhancing emotional intelligence. It is evident in the Table 1.1 that after getting music therapy intervention, individuals in both the experimental groups scored less on aggression (M=170.91, SD=21.76; M=172.56, SD=20.25) as compared to those who did not receive any such treatment i.e. control group (M=231.19, SD=24.34). Significant difference is observed among all the three groups \{F (2, 207) = 167.72, p<.01\}. The scores of emotional intelligence are also presented in Table 1.1. Individuals in Hindustani and Carnatic music experimental group showed higher emotional intelligence after music therapy intervention (M=87.31, SD=9.17; M=86.29, SD=9.43) as compared to control group (M=46.34, SD=6.09). Significant difference has been observed between both the experimental groups and the control group \{F (2, 207) = 545.44, p<.01\}. For
EMG scores, both Hindustani & Carnatic experimental groups (M=41.60, SD=5.21 & M=42.97, SD=4.88) scored low as compared to control group (M=100.62, SD=16.12). Difference between experimental and control groups came out to be significant {F (2, 207) = 764.39, p<.01}.

The other main analysis that is presented in Table 1.1 is MANOVA for the effect of Intervention (Experimental & Control Group) on Aggression, Emotional Intelligence and EMG. The MANOVA results showed significant difference between control group and experimental group {F (6, 206) = 135.074 (exact statistic), p < .01}. To provide more confidence in the efficacy of intervention, pre-intervention scores on all three questionnaires were also compared with post-intervention scores in both control and experimental group. Pre-Post comparisons are presented in Table 1.3 through Table 1.5

Table 1.3: Comparison of Pre and post intervention (Hindustani Music) scores on Aggression, Emotional Intelligence and EMG

<table>
<thead>
<tr>
<th>Variables</th>
<th>Intervention (Hindustani Music)</th>
<th>t-ratios</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre scores</td>
<td>Post Scores</td>
</tr>
<tr>
<td></td>
<td>Means</td>
<td>SD</td>
</tr>
<tr>
<td>Aggression</td>
<td>243.89</td>
<td>21.61</td>
</tr>
<tr>
<td>EI</td>
<td>42.79</td>
<td>4.94</td>
</tr>
<tr>
<td>EMG</td>
<td>102.45</td>
<td>18.76</td>
</tr>
</tbody>
</table>

**Significant at .01 level

In this experimental group, the mean of post-intervention aggression scores was lower (M = 170.91, SD = 21.76) than mean of pre-intervention aggression scores (M = 243.89, SD = 21.61) and difference between these scores came out to be significant {t = 19.91, p < .01}, which means that after music therapy aggressive tendency of the participants in experimental group reduced. It also shows that post-intervention mean score of experimental group on emotional intelligence (M = 87.31, SD = 9.17) and EMG (M = 41.60, SD = 5.30) were lower than their pre-intervention mean score on emotional intelligence (M = 42.79, SD = 4.94) and EMG (M = 102.45, SD = 18.76). Significant difference has been observed between pre- and post-intervention scores on emotional intelligence {t=35.77, p < .01} and EMG {t = 26.12, p < .01}

Table 1.4: Comparison of Pre and post intervention (Carnatic Music) scores on Aggression, Emotional Intelligence and EMG

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Table 1.4 shows that post-intervention mean score of experimental group on aggression (M = 172.56, SD = 20.25) was lower than their pre-intervention mean score on (M = 246.07, SD = 19.05). Significant difference has been observed between pre and post-intervention scores on aggression \( t=22.12, p < .01 \). Similar trend was seen in emotional intelligence and EMG. The difference between pre and post mean scores of emotional intelligence came out to be significant \( t=34.20, p < .01 \). Results also reveal significant difference between pre and post mean scores of EMG \( t=26.14, p < .01 \).

Table 1.5 depicts that in control group no significant difference was observed between pre- and post-intervention scores on Aggression \( t=1.51, p > .05 \), Emotional Intelligence \( t=-1.34, p > .05 \) and EMG \( t=1.97, p > .05 \). All these values were found to be statistically non significant, proving the control group did not show any change in their post intervention scores whereas both the experimental groups showed remarkable difference in pre and post scores on all the three variables proving the efficacy of music therapy intervention in reducing aggression & EMG, and enhancing emotional intelligence.
It was hypothesized that aggressive adolescents would benefit more from Hindustani music as compared to Carnatic music because one of the unique characteristics of Indian music is the assignment of definite times of the day and night for performing Raga melodies. But the results were found to be contrary to this hypothesis showing no significant difference between the efficacies of Hindustani & Carnatic music.

**DISCUSSION**

Music is a time ordered and a structured stimulus. Gaining control over one’s thoughts means maintaining control over one’s life. This study was conducted to investigate the effects of music intervention on aggressive behavior in adolescents. Adolescents in the music intervention group showed greater improvement in emotional intelligence and reduction in aggressiveness after 15 weeks than controls. The first hypothesis of this research that music therapy would reduce aggressive tendencies has been proved. As depicted in Table 2.2, after intervention, adolescents in experimental group showed significantly less aggressive tendencies as compared to those in control group. Results, as depicted in Table 2.3, showed that post-intervention scores of experimental group on aggression were significantly lower than their pre-intervention scores. It indicates that music therapy sessions helped adolescents to master their aggression. **The results are in line with our first hypothesis.** This result is in line with several previous trials and reviews which have determined that music therapy is beneficial for reducing anxiety (Kain ZN, Caldwell-

<table>
<thead>
<tr>
<th>Variables</th>
<th>Hindustani Music</th>
<th>Carnatic Music</th>
<th>t-ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Means</td>
<td>SD</td>
<td>Means</td>
</tr>
<tr>
<td>Aggression</td>
<td>170.91</td>
<td>21.76</td>
<td>172.56</td>
</tr>
<tr>
<td>EI</td>
<td>87.31</td>
<td>9.17</td>
<td>86.29</td>
</tr>
<tr>
<td>EMG</td>
<td>41.53</td>
<td>5.21</td>
<td>42.97</td>
</tr>
</tbody>
</table>

The findings can be explained within the framework of physiological basis of music therapy and aggression. Research in neurological functioning supports the association between music and cognitive development. Our brain responds to music in four distinct ways: cognitive, physical, affective, and transpersonal (Harvey, 1997). Mechanism through which music is processed, the reticular activating system (RAS), consists of cell groupings located within the brainstem that allow incoming sensory information to be filtered resulting in efficient thought and action. When music is played, stimuli are sent from the axons of the ascending sensory fibers to the neurons of the RAS. The stimuli are then transmitted more effectively, by way of the nonspecific nuclei of the thalamus, upwards towards the regions of the cerebral cortex like prefrontal cortex, the limbic system, and the corpus callosum, and downwards towards the regions of the autonomic nervous system and neuroendocrine system (Coughlan, 1994; O’Sullivan, 1991). Prefrontal cortex is that area of brain from where the decision making abilities are developed (Strub, 1989).

The other major purpose of the current study was to examine the efficacy of music therapy in enhancing emotional intelligence among adolescents. The results clearly indicated that following intervention, experimental group showed significantly higher emotional intelligence as compared to control group. Also, pre- and post-intervention scores of experimental group on emotional intelligence differ significantly. It shows that music therapy helps adolescents in regulating their
emotions more effectively. These findings lend support to our second hypothesis. As emotional intelligence skills are being developed, emotional changes can be observed through behavior (Goleman, 1995). During adolescence, the brain grows at an exponential rate (Rately, 2001). As the brain is highly “plastic” at this stage, it can reorganize itself to established or strengthen circuitries that were not formed since birth in response to the environment (Rately 2001, Damasio, 1999). These limbic-prefrontal circuitries can be enhanced through music programmes (Chalabi, Turner and Delamont, 2006, Levitin, 2006; Campbell, 1997), as music invokes emotions (Cook, 1959; Khalfa, Schon, Anton and Liégeois-Chauvel, 2005). It will not only improve learning and memory, but also emotional intelligence (Goleman, 1995, 1998). This area of the brain is responsible for executive brain functions such as planning, impulse control, attention, and acts as a filter by decreasing distracting stimuli from other brain regions. Damage or low activation in this area can reduce an individual's ability to filter out distracting stimuli, ultimately resulting in poorer organization, a loss of attention and increased impulse. Music provides opportunities for enhancing a sense of control over emotions, especially aggression and anger, through emotional catharsis (Lippin RA, Micozzi MS. Arts therapy 2006; Wiesenthal DL,et.al. 2003). When music enters the sensory system, it goes to the limbic system before passing it to the prefrontal cortex (Goleman, 1995). The limbic system is where the brain processes the emotion (Levitin, 2006; Chalabi et al, 2006, Khalfa et.al.2005). Therefore, the emotional state of the person may be improved by music (Campbell, 1997).

The hypothesis that Music therapy would reduce muscular tension measured by Electromyograph proved to be true as the results showed remarkable reduction in EMG scores after the intervention. This may be due to the fact that musical stimuli perceived by the individual as pleasant and relaxing may best enhance the physiological and psychological processes of relaxation (Davis & Thaut, 1989) as music decreases the frontalis muscle activity. Music helps in releasing tension from muscles. Listening to music can produce endorphines that can reduce the amount of stress, pain and fatigue we feel (McClelland, 1979).

Support for the present findings could be derived from some previous studies (Cook, 1986; Kaminski & Hall, 1996) which have indicated that certain types of music can stimulate the production of endorphins, the body's natural opiates, as well as reduce levels of cortisol and noradrenaline, hormones related to stress. Wasserman (1972) saw music therapy as a tool to
improve emotional responsiveness and recently Music therapy can also help with assisting internal organization and co-ordination of the mind and body (Gaston, 1968; Montello, 1996).

Assuming that music intervention is a potentially useful treatment option for aggression and emotional intelligence of children, its’ possible mechanism of action may be of interest. Possible mechanisms include relaxation effects (Lindblad F, Hogmark A, Theorell T, 2007), which may modulate the endocrinal responses and stabilize autonomic nervous systems (Freeman LW 2001; Suzuki M, Kanamori M, Watanabe M, Nagasawa S, Kojima E, Ooshiro H, et al. 2004 ). Music intervention also has effects on the brain function resulting in neural network activation, and ultimately leads to activation of different regions of the brain if performed regularly (Schmithorst VJ, Holland SK, 2003). These effects also produce better physical and psychological function, and therefore have beneficial effects on stress responses; reducing anxiety, improving mood and lessening pain perception (Sacks O., 2006).

In conclusion, our results show that music intervention can reduce aggressive behavior and improve emotional intelligence in children with highly aggressive tendencies. However, further randomized studies with more objective measures such as hormones related with aggression, larger sample sizes, measurement after multiple sessions and long-term follow-up are needed to verify the effect of music intervention on aggressive child behavior. Creating an evidence base in music therapy for this selected group will assist music therapy clinicians, psychologists and medical practitioners in establishing best practices in mental health care.
References


