Music is an integral part of human life. Actually it is unfair to mention about human beings only. Animals also are drawn to musical stimulus. It is often said cats are drawn to a piano being played (Kurganov, 2007) dolphins' love for violin is phenomenal even venomous creatures like snakes are well tamed by music. They might not appreciate music through audition like us. Nevertheless the musical vibrations sip inside them and soothe their beings.

According to Pythagoras the cosmic world can be understood musically. The dominant notes of the universe are in proportion, order, and harmony. From Pythagoreans originated the doctrine of the "harmony of the spheres", a theory according to which the heavenly bodies emit constant tones, corresponding to their distances from the earth. The cosmos is thus perceived as a single lyre. The idea that "all things are numbers" and that there is a connection between the laws of music and harmony, was much later picked up by string theorists, who see that the "Mind of God represents cosmic music resonating through ten-dimensional hyperspace." (Michio Kaku in Parallel Worlds, 2005)

Our prenatal life is a musical one. We hear the mothers' heartbeat and the oceanic sounds that her body generates.
So music soothes us for the rest of our lives. We can say that we are all musical creatures and music therapy is no invention. It is a mere discovery and we can at best improvise it according to our own requirement and preference.

Music touches us deep down. Severe brain injuries also fail to destroy those areas of the brain which are responsible for the appreciation of music.

Autism today is regarded as bonafide neurological disorder. The autistic brain is different from a normal person's brain. But the capacity to appreciate music is more if not less than the non-autistic population. Persons with autism are inevitably drawn to music. There glass shell can best be penetrated through music. Autism has the highest co-morbidity with epilepsy (Kaplan and Saddock, 1995).

Epilepsy has also been soothed through music, especially (Jenkins, 2000) through Mozart.

So the present study has attempted to heal musically, persons with autism effected and unaffected by epilepsy.

It has chosen receptive form of music therapy.

SAMPLE

The sample consisted of already diagnosed 90 autistic children who were under early intervention in some special schools of Kolkata, India. Their level of autism ranged from mild-moderate to severe (according to CARS) and they were of 4 to 16 years of
age. Both male and female subjects constituted the sample. The total sample size was divided in two groups the experimental and the control group.

Experimental Group - This consisted of 45 children, 15 of them having at least one epileptic attack within the past 6 months.

This entire group was also divided into 3 groups according to their age:

- Group A 4-8 years
- Group B 9-12 years
- Group C 13-16 years

Each group consisted of 15 children.

The mother group was divided into 3 groups

- Group A Mild - Moderate group
- Group B Moderate- Severe group

The mother group was rearranged into 2 groups again

- Group A - 15 children with epilepsy
- Group B - 15 children without epilepsy

The 2 groups were matched according to age, gender and level of autism.
This group received musical intervention along with their regular management program.

Control Group - This also consisted of 45 children. They were matched in terms of age, gender and level of autism with the control group.

Children with epilepsy were not included in this group.

Children having any other disability or mental disorder were excluded.

Children exposed to musical intervention in the past 6 months were also excluded.

HYPOTHESES

1. There is no effect of Musical intervention on:
   a. Problem behaviour
   b. Communication
   c. Socialization

2. There is no effect of Hindusthani raag on:
   a. Problem behaviour
   b. Communication
   c. Socialization
3. There is no effect of western tune music on:
   a. Problem behaviour
   b. Communication
   c. Socialization

4. There is no difference between eastern and western music intervention on:
   a. Problem behaviour
   b. Communication
   c. Socialization

5. There is no effect of musical intervention upon children with autism of different age groups upon their:
   a. Problem behaviour
   b. Communication
   c. Socialization

6. There is no effect of musical intervention upon children with autism of different severity of autism upon their:
   a. Problem behaviour
   b. Communication
   c. Socialization
7. There is no effect of musical intervention upon children with autism having and not having epilepsy upon their:

   a. Problem behaviour
   
   b. Communication
   
   c. Socialization

The probability level for significance was taken as 0.05 i.e. 95% cases.

VARIABLES

Dependent variables:

Socialization:

Social deficits may be the most long-lasting and handicapping aspects of autism (Park, 1986; Rumsey et al., 1985). Socialization is reflected through the individual’s pattern of attachment, self-concept, social play etc.

Deviance in socialization in these children is manifested in form of "aloofness", inability to develop reciprocal eye contact and social smile. With high functioning autistic children the rudimentary social relationships can be developed but they lack the richness (Volkmar & Cohen, 1985).

Three factors seem to discriminate autistic children’s attention to other people. First are the attempts to avoid direct eye gaze or auditory input; such behaviours are extremely rare in normally
developing children or developmentally delayed children (Kubicek, 1980). Second is the infrequency with which autistic children try to attract other people’s attention (Dawson & Galprent, 1986). Third, are the specific deficits in joint-attention. Autistic children are less likely to follow another person’s gaze or point to “share” attention to an object with someone else (Kasari et al., 1990).

Most parents of autistic children report their concerns about their children’s attachments to them. The lack of attachment in autistic children are revealed by the fact that the differences in quantity and quality of their interaction with parents and strangers are less than for mentally handicapped or normally developing children of equivalent cognitive levels (Sigman & Mundy, 1984).

Adaptive skills (such as toileting and feeding oneself and responding to “no”) are a part of social skills because their absence has real implications and they can have a significant effect upon a child’s access to different social situations (Schopler, 1989).

Play is considered as a medium of socialization. Numerous studies have shown that young autistic children show less appropriate functional play in unstructured situations (Mundy et al., 1986; Sigman & Ungerer, 1984) and less frequent and less complex symbolic play in structured situations (DeMyer et al., 1967; Mundy et al., 1986; Sherman et al., 1983) than children of equivalent cognitive or language levels. Children with autism prefer solitary and repetitive play, which lacks spontaneity and
initiation. Their difficulty in playing is not only because of their lack of insight, but also, because of their limitations in social development.

*Communication*:

Delay in language development is a diagnostic criterion in autism. They lag behind in both receptive and expressive language. Most of the children with autism do not develop functional speech.

Specific symptomatology related to the social and communication impairments in young autistics may include absence of social reciprocity through action and vocalization prior to one year, limited social orientation, absence of conventional nonverbal communication (pointing, showing gestures, head shakes etc). Beyond two years of age, absence of speech in approximately 50% of children with autism and delayed development of speech in children who eventually do speak at a later phase of development. In as many as 85% of children with autism who develop speech, immediate and delayed echolalia is characteristic of early speech patterns (*Prizant, 1987; Schuler & Prizant, 1985*). Some children who develop speech may experience “speech loss”.

For those children who can speak, limitations in communication intent and a restricted range of communicative functions have now been documented through a number of studies and they came to the conclusion that speech is not used for interactive purposes but for instrumental purposes only (*Schuler, 1979; Wetherby & Prutting, 1984*).
Kanner (1943) outlined features of language in autism which includes- mutism, echolalia and pronoun reversal. For those who speak, language is more "instrumental" than "expressive", that is they interact not to socialize but only to gratify their basic needs.

**Problem Behaviour:**

Repetitive behaviours and special interests are defining features of autism described by Kanner and others (1943) as well. People with autism who engages in these behaviours seems driven under pressure to carry out the activity in a certain way, but whenever they are interfered with, they become anxious, which often results in a wide range of behavioural problems.

Behavioural problems also generate from sensory dysfunctions. People with autism may be hyposensitive or hypersensitive to certain stimuli as a result of which they do not respond to that stimulus in general way. For example a child who is hypersensitive to sound may resist even the sound of a moving fan and express his distress in form of excessive crying and screaming. Thus, these behaviours are perceived as problematic by the society.

These behaviours and special interest can take many forms and can vary with developmental function. At an early developmental level, stereotyped behaviours can be in form of hand flapping, finger twisting, twirling and spinning of objects. They involve sensory dysfunction related problems like licking, smelling or making odd sounds.
At another level of development, preoccupations may include lining up objects, showing attachment to an object like string, nail or a toy. Interest may be expressed in a part of a toy such as wheel of the toy car without any concern for the whole object.

At a high level of developmental function, obsessive interests may relate to phone schedules, birth dates, commercials etc. For many people changes in routes to school, in customary arrangements of furniture or in their regular routine may cause great distress.

Repetitive behaviours may show up when the child is bored or frustrated, especially from social and communication problems typical of autism. Some research data suggest a possible biochemical basis for such repetitive preoccupations (Bresse et al., 1987).

Attempts are often made to eliminate these behaviours with standard behaviour management techniques without understanding the trigger mechanism and the significance of a particular behaviour for the individual. It needs to be remembered that repetition and special interests not only have the potential for creating behavioural problems but also can produce special skills, talents and work habits that can be shaped into productive social and vocational work habits.
Independent Variables:

Musical Intervention:

The tryst of autism and music is a long one. Persons with autism respond beautifully to musical stimulus while they remain untouched by anything else. Autism is often taken as a communication disorder. But musical communication is somehow possible. This brings up the concept of communicative musicality.

Communicative Musicality explores the intrinsic musical nature of human interaction. The theory of communicative musicality was developed from groundbreaking studies showing how in mother/infant communication there exist noticeable patterns of timing, pulse, voice timbre, and gesture. Without intending to, the exchange between a mother and her infant follow many of the rules of musical performance, including rhythm and timing (Malloch, 1999).

In spite of all the woes the disability brings with it communicative musicality remains intact.

Music is non linguistic emotional communication. It can approach the limbic system directly without having to take the help of language (Sancar, 2002). As a result persons with autism respond emotionally with music.

So in this study music are taken to heal autistic symptoms. The study is in an Indian setting with Indian children. So it is expected
that the children would respond favourably to Indian ragas because of familiarity.

Mozart is an age old tool in music therapy. So it is also taken with the aim of quantifying the relief our children experience from it as well.

Music therapy is well practiced in the western world. Music therapy has been defined as a systematic process of intervention where in the therapist helps the client to promote health, using musical experiences and the relationships that develop through them as dynamic forces of change" (Bruscia, 1998) Central techniques in music therapy include free and structured improvisation, songs, and listening to music. The processes that occur within musical improvisation may help people with autism spectrum disorder to develop communicative skills and their capacity for social interaction. Musical interaction in music therapy, in particular musical improvisation, is sometimes understood and described as a kind of non-verbal and pre-verbal language which enables verbal people to access pre-verbal experiences, enables non-verbal people to interact communicatively without words, and enables all to engage on a more emotional, relationship-oriented level than may be accessible through verbal language (Alvin, 1991).

Music therapy for individuals with autistic spectrum disorders is usually provided as individual therapy. A rationale for the use of music therapy for individuals with communication disorders is based on the findings from infancy researchers such as Stern
(Stern, 1985, Stern, 1989) and Trevarthen (Trevarthen, 1999a) who describe sound dialogues between mothers and infants using musical terms.

In the jewel box of western music therapy Mozart’s symphonies and sonatas can be regarded as the diamonds.

The most sparkling one K448 has been selected.

**Eastern Music**

India has a rich cultural heritage. Indian Music owes its credits to the Vedic Culture. Indian Music has been treading the path of evolution and changes, since then. There are many popular forms of music like folk, devotional, natya sangeet (drama music), light film music, Ravindra sangeet, gazals, etc. All forms have their own sub-categories. In spite of these forms, Classical Music still has retained its status and popularity all over India. Classical Music performers have always been a pride of India.

*Today, Indian Classical Music is broadly divided in 2 branches:*

1. Hindustani or North Indian

2. Carnatic or South Indian Music.

There are a few peculiarities of North Indian Classical Music. Though not all, many of them are common to Carnatic Music also,

Raga is a special concept of Indian music. This concept is unique to Indian Music, both Hindustani and Carnatic style. Ragas are
peculiar types of scales that have an aesthetic value. Raga is a melodic language of the heart. The notes of the scale have a specific melodic structure. The Raga has to follow certain rules for rendering the notes. Also, every raga has its own style of pronouncing every note. Therefore different ragas have different chemistries and hence different effects.

The Ragas are based on a time theory. Each raga is allotted its special time of the day and/or year. It is believed that every note has a different emotional value, and its proper use can intensify or pacify emotions. So, the allotment of time depends on the notes included in the Raga and their melodic rules. Rules of the melodic structure vary for each Raga. Some notes are strong, some weak, some used only in specific cases, some are avoided, etc. It is believed strongly, that ragas have a therapeutic value, if sung properly (Gokhale, 2007).

It is believed that music stimulates the pituitary gland, whose secretions affect the nervous system and the flow of blood. It is believed that for healing with music, it is necessary to vibrate the cells of the body, for it is through these vibrations that the diseased person's consciousness can be changed effectively to promote health. The right kind of music helps one relaxes and refresh. Even during the course of working, light music improves efficiency. Listening to music helps control negative aspects of our personalities like worry, bias and anger. In addition, it can help cure headache, abdominal pain and tension. Music therapy is one
of the most effective ways of controlling emotions, blood pressure
and restoring the functioning of the liver. (www.yogavision.com)

The Raga Research Centre in India is currently making a
comprehensive study of Indian ragas and evaluating their
therapeutic potential with the help of musicians, doctors and
psychiatrists. It is believed that classical Indian ragas can benefit a
whole host of conditions ranging from insomnia, high and low
blood pressure to schizophrenia and epilepsy.

It is believed that there are other ragas that can help against pain,
too. Music is capable of improving happiness, peace, health and
concentration. It is however important to know the method and
duration for which Music Therapy is to be administered. This
knowledge can be obtained through regular experiments and
experience. The first step towards this is the correct diagnosis of
the disease and then the selection of the precise raga that will be
helpful. Procedure, discipline and a systematic method will help
achieve this goal.

Music can play an effective role in helping us lead better, fruitful
lives. Listening to specific kinds of music at specific times of the
day has been shown to be helpful in maintaining good health.
Indian music, with its many Ragas, is known to be particularly
therapeutic value. The curative power of music emanates from
the resonance of certain ragas on hormonal and glandular
functions which produce secretions that keep the body balanced
and infection free.
Organismic Variables

Age-The modern diagnostic techniques has made diagnosis of autism possible in 30 months of age. Early diagnosis is essential because it makes early intervention possible which in turn leads to better prognosis.

"Infant brains are quite malleable so with we’re trying to capitalize on the potential of learning that an infant brain has in order to limit autism’s deleterious effects, to help children lead better lives," said Sally Rogers (2009), a professor of psychiatry and behavioural sciences.

In the present study we have 3 age groups:

- Group A-4-8
- Group B 9-12
- Group C 13-16

So, here it is expected that due to early intervention the youngest group will gain the maximum.

So, here it is expected that due to early intervention the youngest group will gain the maximum.

Severity-Every person with autism is unique. Two children with the same severity and even a similar scatter in CARS can manifest diametrically opposite symptoms of the disorder.
Nevertheless the score gives an indication of how much the child is into his autistic world.

A child with a score showing more severity indicates that his related to the rest of the environment is less. Therefore his motivation to learn communication and socialization is less. He is mostly interested in playing with the toys in a stereotypic manner or he demonstrates a set of repetitive behaviour. The glass wall is so thick that communicating with him through it becomes a big challenge. However this challenge becomes manageable with a person with a lesser severity of autism. He can be coaxed to engage in a level of communication and socialization. So, lesser the severity easier it is to bring him out.

The present study has been conducted with 2 levels of autism:

- Group A Mild-Moderate
- Group B Moderate-Severe

We therefore expect the least severe group to gain the maximum.

Epilepsy

There is an increased and variable association between autism and epilepsy. Autism is a complex neurodevelopmental disorder. When associated with epilepsy, it places the child and the family in a very demanding and stressful situation to cope with.

Kanner (1943) reported one case of epilepsy among his 11 children. The prevalence of epilepsy among autistics is much
higher than the normal population. There is also an increased prevalence of abnormal potentially epileptogenic activity in children with autistic spectrum disorder. About one in four autistic children develop seizures at puberty.

Children with symptomatic infantile spasms (sudden generalized muscle contractions usually beginning between the ages of three and eight months) tend to develop both epilepsy and autism. Complex partial seizures or temporal lobe epilepsies show different clinical features in children of different ages. The general course tends to be favourable. Adverse course may be seen in children with perinatal complications, spike-wave complexes in the EEG and those with psychomotor and psychosensory seizures. Hashimoto et al., (2007) reported a tendency for epileptic foci to occur in the frontal region in autistic children and they suggest that frontal dysfunctions may be important in the mechanism of symptoms of autism (Ramanujapuram Anand, 2007).

Both autism and epilepsy show some irregular brain activities. Music regulates brain activities.

So the present study has included autistic children both with and without epilepsy.
TOOLS

1. The Childhood Autism Rating Scale

2. Portage Early Education Programme (PEEP)

3. Problem Behaviour Checklist

The Childhood Autism rating Scale (CARS) is a 15 item behaviour rating scale developed to identify children with autism, and to distinguish them from developmentally challenged children without autism. It further distinguishes children with autism in the mild to moderate range from children with autism in the moderate to severe range. It was constructed by Schopler & Reichler in 1971, to enable clinicians to obtain a more objective diagnosis of autism in a more readily usable form. The 15 CARS item incorporates, (a) Kanner's primary autism features (b) other characteristics noted by Creak, which are found in many but not in all children who may be considered as autistic, and (c) additional scales useful in tapping the symptoms characteristic of the younger child.

The scale was first developed as a research instrument in response to the limitations of the diagnostic classification instruments available at that time. This original rating scale developed by the Child Research Project at the University of North Carolina at Chapel Hill, was based primarily on consensual diagnostic criteria for autism as reported by the British Working Party (Creak, 1963). Initially it was referred to as Childhood Psychosis rating Scale (CPRS) [Reichler & Schopler, 1971]. However, since the
definition of autism was expanded and no longer was restricted to Kanner’s early use of the term. The instrument came to be known as The Childhood Autism Rating Scale.

The advantages of the CARS lie in the fact that its emphasis on the behavioural and emotional data rather than on clinical initiation moves the focus of diagnosis from a restricted domain of clinical diagnosis to a more broad area where persons from different professions will get appropriate information. The ratings are extremely useful for the identification of the behavioural symptoms, for research purposes, or for classification purposes. The 15 items of CARS include-relating to people; imitation; emotional response; body use; object use; adaptation to change; visual responses; listening responses; taste, smell touch response and use (these three are the measures of sensory peculiarities); fear or nervousness; verbal communication; non verbal communication; activity level; level and consistency of intellectual response and general impression.

*Portage Early Education Programme (The Autistic Continuum)* was introduced by, R.J. Cameron and Mollie White. THE AUTISTIC CONTINUUM (TAC) allows a thorough investigation of the behaviours, skills and needs of children with autistic spectrum difficulties. It helps to decide in which areas intervention may be appropriate. TAC is also used to monitor progress and changes as the child develops, so that teaching or therapy remains realistic and relevant to the child's needs. TAC is invaluable to any professional whose work brings them into contact with children.
whose difficulties may be viewed within the context of autism. TAC helps them to decide what to look at, how to interpret the information and how to use it appropriately. It will also be extremely useful for students or professionals who simply wish to know more about this complex disorder.

The Autistic spectrum includes difficulties ranging from the very subtle to the severe and TAC is designed to reflect this variability. It is divided into sections covering the different developmental areas to be considered. There is no time limit or complex scoring involved. It also provides a helpful account of the wider implications of specific behaviours. The PORTAGE scheme is designed to teach developmentally delayed children important skills in six key developmental areas. They are—infant stimulation, motor, cognitive, socialization, self-help and communication. It consists of 624 behaviours, which are sequenced into years or stages of development. The scores are obtained in terms of mental age.

Although originally intended for use as a home teaching scheme, Portage has been developed for use in variety of setting. Home-based teaching is still, however, the central feature of Portage with each family receiving weekly visits from home visitors from different professional groups, (health visitors, teachers) Portage schemes have now been organized by local education and health authorities, social services departments and voluntary groups in many countries around the world. PORTAGE EARLY EDUCATION PROGRAMME (PEEP) provides all materials and instructions
necessary to implement a Portage Scheme: THE PORTAGE EARLY EDUCATION PROGRAMME - A Practical Manual Written by R J Cameron and Mollie White (two of Britain's leading exponents of Portage), the manual is written in an accessible and non-technical style and the layout makes it easy to refer to particular items or areas of interest. It provides a basic, practical guide to the Portage approach, considering not only immediate matters (such as how to use the Checklist) but taking a wider perspective (such as coping with disruptive behaviour). The Checklist is used initially to assess a child's developmental level. It consists of 624 behaviours which are sequenced into years or stages of development. The Activity Cards provide suggestions for teaching each of the 624 behaviours included on the Checklists. The Cards are colour coded to reflect the six developmental areas.

For the present research only cognition, socialization and communication was used for assessing the pre and post intervention conditions of the autistic children.

The Problem Behaviour Checklist (Guharoy and Banerjee 2007) was constructed for the research purpose to assess behavioural problems of the autistic children. Following are the steps followed for construction

1. Statements related to autistic children were collected and written following the rules mentioned by Edward (1957). The sources of the statements being literature survey and intense observation. Initially 104 statements were constructed encompassing 17 domains of behavioural problems.
2. Those items were given to 50 judges (Psychiatrists, Clinical Psychologists, Rehabilitation Psychologists, Special Educators and Parents of Autistic children, 10 individuals in each category), for relevance judgment on a 5-point scale.

3. From their judgments, mean and standard deviation were calculated along with item total correlations. The most relevant items with a mean value $\geq 3.5$ (more than moderately relevant) and S.D. less than 2 were retained.

4. After this item total correlations were calculated. The items, which obtained below 0.6 correlation value were eliminated. Finally, the scale comprised of only 52 items with 15 domains.

5. For establishing the norm, data of 100 already diagnosed autistic children were collected and reliability was calculated to be 0.8676 (Chronbach’s alpha). According to mean and S.D. of the distribution the range of problem behaviour is as follows:

<table>
<thead>
<tr>
<th>Range</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>52 to 73</td>
<td>Very mild</td>
</tr>
<tr>
<td>74 to 95</td>
<td>Mild</td>
</tr>
<tr>
<td>96 to 156</td>
<td>Moderate</td>
</tr>
<tr>
<td>157 to 198</td>
<td>High/Extreme</td>
</tr>
<tr>
<td>199 to 230</td>
<td>Severe</td>
</tr>
<tr>
<td>230 above</td>
<td>Very severe</td>
</tr>
</tbody>
</table>
Clinical validity was tested i.e. those who were already identified jointly by the parents, special educators and Rehabilitation Psychologist as having severe problem behaviour, had scored between 199-230 and so on.

This checklist was used in this research to measure problem behaviour which has been considered as one of the dependent variable.

PROCEDURE

Selection of Music

Hindustani Raga: It is popularly established that there are specific ragas, which create specific effect. Such effect is often therapeutic in nature. This fact, however, do not have scientific credential as yet. Indian Ragas can be divided into 2 groups: *

* The exciting ones i.e.,

1. Dipak
2. Hindol
3. Vasanta
4. Iman
5. Pancham
The tranquilizing ones i.e.,

1. Sree
2. Hanswadhani
3. Bilabal
4. Pilu
5. Brindabani Sarang

(Danielou, 1980)

The persons with autism are found to have a heightened level of arousal. This condition makes management difficult, leading to problem behaviour, poor socialization and communication. So, it becomes important to bring down heightened level of arousal.

For this purpose it was necessary to select a raga having a soothing and tranquilizing effect.

So the first group had to be rejected.

Further literature review started with the second group of Ragas.

Shree was the one with maximum tranquilizing effect (Pragyananda, 1900)

Shree is a very old North Indian raga is said for have related to lord Shiva. It also appears in the Sikh tradition from the northern India and is a part of "Guru Granth Sahib". Traditionally Raga Shree was favoured for religious events and is found in many
ancient articles on music. It is a rare but popular raga and is usually performed at sunset. Its mood is one of majesty combined with prayerful meditation.

_The nominal ascend and descend (as per our traditional text) is:_

\[
S \text{r, (G)r (G)r m P, N S"::S"}, \text{ r" N d P, d m G r, (G)r S}
\]

However the standard ascent-descent really does not tell much about the essence of the raga and it must be considered as just the preliminary aid. Knowing a raga involves investigation of its biochemistry, the position of 'pramana' of all the notes employed, their interrelationships and the application. Shree is no exception to this rule. It has a complex and specific rolling traversal ('meend pradhan and bakra') and requiring special note enunciation. It places unusual demands on the musicians reflective daemon and calls for cultivation of proper habits of mind and voice. Overall, in the hands of a master Shree can lead to an ennobling experience.

In the ascent movement, Shree omits the gandhar and dhaivat. The central idea is the coupling of komal rishab and pancham. The intonation of the rishab tugged with the gandhar and the rolling of rishab to pancham defines this raag's signature.

Overall, the combination of notes, the time of the day, the parent note structure, the rolling between pancham and rishab, the subtle tugging of gandhar and the mastery of the performer seems to create a calm, mystic and soothing experience; probably being the reason for being used in so many Sikh "Guru Granth Sahib".
An instrumental demonstration in Sree was explored. Sree has close resemblance with a few popular ragas. So, performers avoid playing it fearing treading wrongly upon the paths of another raga and therefore contaminating the original one. A handful of vocal recitals were found. But there the musicians have focused more upon the technicalities of the raga than upon the aesthetic. Unfortunately a performance in Sree was difficult to find. So, it had to be rejected.

A pilot study was started with Raga Hanswadhani. Five children were selected. It was decided that 4 sessions of 15 minutes will be given to each child. Heightened arousal was regarded as the D.V in concern. The first 3 children after receiving the stimulation showed a visible increase in hyperactivity. The study was immediately stopped for ethical reasons:

• In Raga Hanswadhani the movement from one note to another is sharp. Similar movements were seen in Bilabal and Brindabani Sarang. Raga Bilabal and Brindabani Sarang were rejected. Pilu uses all the twelve notes giving lots of freedom and independence to the artist for creativity.

• It is a combination of three popular ragas and does not have any core essence as probably Yaman or Bhairavi will have. This raga is very rarely used in pure classical demonstrations in forms such as Dhrupad or Khayal. The only Khayal recording found was from a top master of previous century Ustad Abdul Karim Khan for about three minutes. The rendering was short, and but for a trained connoisseur it will
be even difficult to recognize it as Raga Pilu. That brings another aspect of this raga and its popularity. This is meant to be improvised for lighter forms of Indian Classical music like Thumri, Dadra, Hori or Kajri. It is also a well known fact that these lighters forms emphasize more on the emotional aspects, creating an emotional appeal rather than the sheer joy of technical correctness.

In its improvised versions Pilu popularly encourages the sequential usage of the usual and softer versions of the same note. For example a "Meer" (rolling from one note to another) combination can be "sa ni Ni dha Dha pa ma ga Ga sa ni sa". This smooth gliding of notes all across the octaves can create a very soothing effect on the mind, even if someone misses the mastery and control needed to execute the same.

Raga Misra Pilu was selected. Mishra Pilu is a variant of Pilu and thus inherits most of its parental traits. The pure raga would involve more of technical correctness and that might lead to a compromise in the aesthetic appeal of the rendering. A pilot study was conducted. There was a significant decrease in arousal level. A flute composition by Raghunath Seth was selected.

To select the Western counterpart:

A western counterpart of the selected raga was needed.

Literature survey has shown that specific symphonies of Mozart enhance adjustment in children with autism (Jenkins, 1993). The
symphonies of Mozart can be regarded as the tried and tested intervention tool in music therapy.

Keeping these criteria in mind a symphony with maximum notes used was selected.

K448 was selected.

The music selection was done under the supervision of Mrs. Rajyashree Bhattacharya, lecturer, Bengal Music College.

DATA COLLECTION

1. The demographic data was collected from the institutions.

2. The sample was selected according to the inclusion and exclusion criteria described above.

3. Rapport was established with the 90 children by participation the school group activities.

4. Data on PEEP and the problem behaviour checklist was taken though direct interaction with the children, observation in different scenarios. Data thus obtained was verified from the teachers, caregivers and parents.

5. Data collection on level of arousal started. Many of the children refused to sit still when the electrodes were fixed on them. Those children who sat still removed the electrodes in the first opportunity. Many children used to rocking refused to stop even for the 5 minutes. In spite of
the best results the data obtained was largely spurious, may be by artefact and/or by other reasons, viz, the children could not follow the instructions required to take the test etc. So, though a measurement of the level of arousal was within the scope of the study it had to be dropped.

Sessions

The room was prepared.

- A recliner was kept in one corner of the room near the fan. This was to ensure that the children get maximum physical comfort during the therapy.

- The room was semi-dark. This was to ensure that the child was not visually stimulated and focused only upon the audition.

- A comfortable and padded headphone was arranged. Children with autism are sensitive to strange noise. Headphone was to ensure that all noise other than the therapeutic one is out of the child’s field of audition.

Intervention

6. A level of familiarity was already present between the therapist and child. The children of the experimental group were brought into the room, seated down comfortably and then the headphone was fixed on his ears.
A few children refused to take the headphone. 3 pre-sessions were taken for them. In the first one they were allowed to listen to the tunes without the headphones. In the second and third one the headphone was fixed again when they removed it.

The 4th one was taken into the study if the child did not remove the headphone more than once. If he did he was dropped from the study. Here, it should be mentioned that drop outs were few and far between. Children enjoyed the experience and got adapted to the headphones.

7. The flute recital was of 11 minutes. It was provided to all the children at 4:00 p.m to derive the maximum benefit of the evening raga within the school timings.

8. The Mozart symphony was of 4.5 minutes. It was recorded twice back to back and was provided to the children as a total experience of 9 minutes.

9. 8 sessions of each type of music was taken. Each session was at a gap of 2 days. After finishing one type of music a gap of 1 week was given and the assessment (PEEP and PBCL) was made. Then a gap was 1 week was given. Then the children were exposed to the other type of music in a similar way and assessment was made. Then all the measured data, after eastern music be it first exposure or second, were added as well as the data after intervention with western music be it first or second exposure were added to exclude order effect, if any. So there are 3 sets of data obtained:
a. Pre b. Post eastern c. Post western

3 months after the initial quantitative data collection a round of qualitative data was collected.

10. The children were divided in 2 equal groups. One group received eastern music before and another western, i.e., an ABBA technique was followed to avoid order effect. During statistical treatment both groups were merged.

11. Mean, standard deviation, t-test and ANOVA, were calculated. The results were discussion and a conclusion was reached.