THE EFFECT OF RECEPTIVE VERSUS EXPRESSIVE MUSIC EXPERIENCES ON HYPERACTIVE BEHAVIOUR OF THAI CHILDREN WITH ATTENTION DEFICIT HYPERACTIVITY DISORDER (ADHD)

Sasichom Krudhnark
MA (Educational Psychology and Guidance) BA (Thai Music)

A thesis submitted in total fulfillment of the requirements of the degree of Master of Arts (Honours)

University of Western Sydney
School of Humanities and Communication Arts

March 2012
Declaration

The work presented in this thesis is, to the best of my knowledge and belief, original except as acknowledged in the text. I hereby declare that I have not submitted this material, either in full or in part, for a degree at this or any other institution.

__________________________________
Sasichom Krudhnark

March 2012
Abstract

The present study investigated the effects of playing and listening to Thai music played on a traditional instrument, Ranad-ek, on Thai children diagnosed with Attention Deficit Hyperactivity Disorder (ADHD). The particular style of music used in the study is referred to in Thailand as ‘music influenced by different countries’ (Pikulsri, 1987). Participants were six Thai boys aged 8-10 who were diagnosed with ADHD. They all lived in Thailand but were not known to have previous experience with Thai traditional music. Participants were divided into two groups, the improvising group playing the Ranad-ek, and the listening group, listening to Ranad-ek music played live. Each group took part in eight sessions conducted twice a week. The occurrences of hyperactive behaviours were scored by the parents before and after the program using a Thai-modified version of the Hyperactivity Index of Conners’ Parent Rating Scale (1999). In addition, a behaviour observation form was completed by the researcher during each session.

According to the results of the Conners’ Parent Rating Scale, there was a small numbers reduction in the frequency of most hyperactive behaviours in both groups as follows: Excitable Impulsive (28.33%), Cries Easily or Often (24.81%), Restless Always Up and On the Go (18.73%), Destructive (37.59%), Fails to Finish Things (49.78%), Distractibility or Attention Span a Problem (16.67%) and Disturbs Other Children (40.12%). Further analysis indicates that although both listening to and improvising Thai music may have reduced a number of ADHD associated behaviours, the important things that may also affect the hyperactive behaviours of particular participants were Thai culture and the belief. However, unlike before and after, results of the behaviour observation form suggest that, during the treatment sessions, the improvements in behaviours were slightly greater within the group improvising music.

Future research involving larger samples and different population groups and experimental conditions is needed to investigate whether improvising and listening to Thai music may bring on positive effects on ADHD associated behaviours.
Table of Contents

Title Page  i
Declaration  ii
Abstract  iii
Table of Contents  iv
List of Appendices  vi
List of Tables  vii
List of Figures  viii

Chapter 1  INTRODUCTION  1

Chapter 2  LITERATURE REVIEW  6
  Attention Deficit Hyperactivity Disorder  6
  Clinical Symptoms  7
  ADHD Diagnosis in Thailand  8
  Socio-Economic Background of Children with ADHD  8
  Therapeutic Approaches to the Treatment of ADHD  9
  Responses to Music  11
  The Brief History of Thai Music  12
  The Elements of Thai Music  14
  The Styles of Thai Music  16
  The Ranad-ek  17
  Therapeutic Uses of Thai Music  19

Chapter 3  METHOD  23
  Participants  23
  Design  24
  Materials  24
  Personal Bias  25
  Procedure  25
  Evaluation  26
Data Analysis 27

Chapter 4  RESULTS 29

Chapter 5  DISCUSSION 38
  Improvising Approach 40
  Listening Approach 43
  The Comparison Between Improvising and Listening 46
  Summary and Conclusions 49

REFERENCES 52
## List of Appendices

<table>
<thead>
<tr>
<th>Appendix</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Conners’ Parent Rating Scale</td>
<td>59</td>
</tr>
<tr>
<td>B</td>
<td>Behaviour Observation Form</td>
<td>63</td>
</tr>
<tr>
<td>C</td>
<td>Pre and Post Ratings of the Frequency of Target Behaviours</td>
<td>64</td>
</tr>
<tr>
<td>D</td>
<td>Descriptive Reports by the Researcher</td>
<td>66</td>
</tr>
<tr>
<td>E</td>
<td>Participant Consent Form for Parents/Caregivers</td>
<td>78</td>
</tr>
<tr>
<td>F</td>
<td>Participant Information Sheet (Parent/Caregiver)</td>
<td>80</td>
</tr>
</tbody>
</table>
List of Tables

Table 1  Pre and Post Means Scores of Occurrences of Target Behaviours  29
## List of Figures

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Figure 1</td>
<td>Ranad-ek</td>
<td>3</td>
</tr>
<tr>
<td>Figure 2</td>
<td>Soft and hard mallets for Ranad-ek</td>
<td>17</td>
</tr>
<tr>
<td>Figure 3</td>
<td>Western music and Thai music in regards to the pattern steps in the major scale of C</td>
<td>18</td>
</tr>
<tr>
<td>Figure 4</td>
<td>Consecutive occurrences of ‘Restless and Fidgety’ recorded in the improvising and listening groups</td>
<td>33</td>
</tr>
<tr>
<td>Figure 5</td>
<td>Consecutive occurrences of ‘Moving Around the Room’ recorded in the improvising and listening groups</td>
<td>34</td>
</tr>
<tr>
<td>Figure 6</td>
<td>Consecutive occurrences of ‘Does Not Listen to Others’ recorded in the improvising and listening groups</td>
<td>35</td>
</tr>
<tr>
<td>Figure 7</td>
<td>Consecutive occurrences of ‘Making Inappropriate Noises’ recorded in the improvising and listening groups</td>
<td>36</td>
</tr>
<tr>
<td>Figure 8</td>
<td>Consecutive occurrences of ‘Talking When Not Necessary’ recorded in the improvising and listening groups</td>
<td>37</td>
</tr>
</tbody>
</table>
Chapter 1

Introduction

The American Psychiatric Association or APA (2010) has created *The Diagnostic and Statistical Manual of Mental Disorders*, or DSM-IV-TR, to diagnose children with mental disorders including the criteria for the diagnosis of Attention Deficit Hyperactivity Disorder or ADHD. It notes that there is a 3-7% prevalence of ADHD in school-aged children (APA, 2000). Generally, the American Psychiatric Association has categorised the symptoms and behaviours of ADHD in two groups:

1) Inattention
2) Hyperactivity-impulsivity (APA, 2010, p. 1)

Over two-thirds of children with ADHD exhibit symptoms in both domains (Weibe 2007, p. 5). The behaviours of children who are affected include frustration, weak-mindedness, hot-headedness, explosion, stubbornness, excessive and frequent insistence of attention from others, mood liability, demoralisation and dysphoria. These children can also be rejected by peers and, therefore, have low self-esteem (American Academy of Pediatrics, 2000).

It is known that ADHD symptoms affect the ability to live, to have relationships and especially to study. In terms of the difficulties of studying, children who are diagnosed as ADHD have behaviours obstructing studying, for instance ‘often fails to give close attention to details or makes careless mistakes in schoolwork, work, or other activities’, ‘often does not seem to listen when spoken to directly’ and ‘often has difficulty organizing tasks and activities’ (APA, 2010, p. 1).

In Thailand, there is approximately a 5% prevalence of ADHD in children within the age range of seven and twelve (Pornnoppadol, 2009). In typical primary schools this
means in classrooms of approximately 50 students, there are two to three students with ADHD.

With regard to therapeutic approaches for ADHD, a multimodal treatment is the most effective way to treat this disorder through such interventions as behaviour management, stimulant medication and educational programs (Pornnoppadol, 2009; National Institute of Mental Health, NIMH, 2008). This treatment includes those elements which work together and support each other to produce the best results for children with ADHD (National Resource Centre on AD/HD, 2011). However, there have been many other approaches that have been shown to be effective including pharmacotherapy, behaviour therapy, educational remediation and therapies such as occupational therapy and cognitive behavioural therapy (Sumamal, 2006).

Music therapy is one of the therapies that can be considered a treatment for ADHD children. Research has noted that music therapy has a positive trend in terms of effectiveness. However, there has been no research about using Thai music as a therapeutic tool with children who have ADHD (Jackson, 2003; Montello & Coons, 1999; Rickson, 2006; Rickson & Watkins, 2003).

In research about Thai music activities affecting children’s behaviours, it has been noted that Thai music activities could improve the problematic behaviours of normal Thai children and those with aggression and autism (Dokmai, 2003; Iamyung, 2006; Srisukon, 1996; Comwatjanung 2001; The Occupation Training Centre Khun Poom Foundation, 2010). Dokmai (2003) studied the effect of listening to Thai music on typical children and found that calmness, self-confidence and attention were increased. In addition, children who practised Thai music for at least two years improved their learning achievement, attention and responsibility. Iamyung (2006) reported that adolescents who participated in Thai music activities developed their mental calmness and tended to listen to Thai traditional music more frequently. Srisukon (1996) studied the effect of listening to Thai music alongside movement activity to improve self-confidence in kindergarten children and found that Thai music gave participants more confidence than the control
group who did not receive that treatment. Comwatjanung (2001) found that children who practised Thai music over 12 sessions showed a decrease in their level of aggression.

Despite these different approaches no research has shown the effectiveness of Thai music improvisation and Thai music listening on ADHD children.

I (hereafter referred to as ‘the researcher’) am a counsellor and Thai music teacher, and have worked with children who have ADHD and I believe that Thai music has the capability to improve these children physically and mentally. The present study, as a pilot, therefore, aimed to investigate the effect of Thai music on Thai children who had been diagnosed with ADHD. It compared children improvising on the Ranad-ek with children listening to the Ranad-ek. The Ranad-ek is one of many Thai traditional music instruments. It has 21-22 wooden keys which are strung together and hooked on top of a long boat-shape resonant box at both ends (Figure 1). The Thai music selected for the study was ‘music influenced by different countries’ (Pikulsri, 1987) which is considered more appropriate to use than other Thai song styles because of its characteristic simplicity and pentatonicism.

**Figure 1:** Ranad-ek (Office of the National Culture Commission, 2010)

In the present study, participants were Thai children with ADHD. These children were members of a private club which is an after-school tutoring program run in the capital city for children with special needs. The participants took part in
activities with Thai music, improvising on the Ranad-ek and listening to the Ranad-ek. They were eight to 10 years old and had not been involved in Thai music activity before. The participants were assessed by their parents for hyperactive behaviours using a Thai version of Conners’ Parent Rating Scales (modified in 1999) (Appendix A) before and after program. During the sessions, the researcher, as the music teacher, monitored the children’s hyperactive behaviours using a specially designed behaviour observation form (BOF, Appendix B).

In order to understand the possible implications of Thai music activities on the condition of ADHD, a literature review was undertaken and this is presented in the next chapter. First, there is a discussion and definition of ADHD, including ADHD symptoms, diagnoses, treatments and the socio-economic backgrounds of children with ADHD. This is followed by a review of music and behaviour, a short historical overview of Thai music and a rationale for the therapeutic uses of, and possibilities for, Thai music, specifically that music produced by the Ranad-ek. The literature review concludes with a discussion of the Ranad-ek and the elements of Thai music and Thai music styles.

Chapter three presents the methodology used in the study to determine the effects of Thai music on the hyperactive behaviours of Thai children with ADHD. It provides information about the improvising and listening group participants, discusses the data collection instruments, describes the data analysis and addresses the ethical issues of the study.

Chapter four presents the results of the study, including numerical representations and information from descriptive reports.

Chapter five is a discussion of the findings of the study in relation to the literature reviewed. The thesis concludes with a summary and conclusions including recommendations for future research.

The present study is aimed at increasing the researcher’s understanding of the possible effects of a Thai traditional musical instrument on the selected behaviours of Thai children associated with ADHD. Further, it seeks to determine the best way
to use traditional music in a therapeutic way, an area about which there is currently very little knowledge. The researcher hoped that the findings would assist in further developments in these areas.
Attention Deficit Hyperactivity Disorder

Attention Deficit Hyperactivity Disorder (ADHD) is a condition that received much attention in the late nineteenth century. After World War I this condition was understood to be a form of minimal brain damage. Identified symptoms included a difficulty sustaining attention, problems completing tasks and an inability to engage in play activities. However, 20 to 30 years later, it has been determined that ADHD occurs in people who have an undamaged brain (Lakanapichitkul, 1997, p. 95). Therefore, the name of the disorder was changed to ‘minimal brain dysfunction’ and was also referred to as hyperkinesis or Attention Deficit Disorder (ADD) (Wiebe, 2007, p. 4). Finally, the American Psychiatric Association (2010) identified ADHD as an Attention-Deficit and Disruptive Behaviour Disorder. Children who have problems with attention, hyperactivity and impulsivity are often diagnosed with having this particular disorder (Pornnoppadol & Kademarn, 2007).

The Diagnostic and Statistical Manual of Mental Disorders, or DSM-IV-TR (American Psychiatric Association [APA] 2010), is the current manual for clinicians to diagnose children with ADHD. DSM-IV-TR recognises three subtypes of ADHD. These are Predominately Inattentive Type (PI), Predominately Hyperactive-Impulsive Type (PH) and Combined Type (CT) (APA, 2010, p. 1). The latter refers to children who meet both subcategories of inattention and hyperactivity-impulsivity.
Clinical Symptoms

The symptoms of ADHD must be shown before the age of seven and must be demonstrated in a minimum of two settings such as at home and at school. It must be presented in the past six months (APA, 2010, p. 2).

Children diagnosed with the Predominately Inattentive Type, display these symptoms:

a) Fail to give close attention to details and make careless mistakes
b) Work is messy and careless. Difficulty sustaining attention and completing tasks or play activities
c) They appear as if they do not listen and their mind is elsewhere
d) They may shift from one uncompleted task to another and have difficulty following through on requests or instructions
e) Fail to complete tasks during the diagnosis. Difficulties organizing
f) Avoid and dislike activities that require sustained attention, concentration or organizational skills
g) Avoidance is due to attention, not attitude. Work is messy, materials are usually scattered, lost or damaged
h) Easily distracted by irrelevant stimuli
i) Forgetful in daily activities (APA, 2010, p. 1)

For the Predominately Hyperactive-Impulsive Type, there is a range of symptoms between hyperactivity and impulsivity which are:

a) Fidgeting or squirming in one’s seat
b) Not remaining seated when expected to do so
c) Inappropriate running or climbing
d) Difficulty playing quietly
e) Appearing to often be on the go
f) Talking excessively
g) Impatience, blurting out
h) Difficulty waiting one’s turn
  i) Social, academic, or occupational difficulties because of interrupting or
     intruding on others (APA, 2010, pp. 1-2).

Although there are two subtypes of ADHD, over two-thirds of affected children
meet the symptom criteria in both domains and are thus in the Combined Type
(Weibe, 2007, p. 5).

**ADHD Diagnosis in Thailand**

In Thailand, diagnosis of ADHD is predominantly done by primary care clinicians
through an evaluation of school performance and behaviour, family functioning and
adjustment (American Academy of Pediatrics, 2000). DSM-IV-TR is used as a manual
for the diagnosis of children with ADHD (Pornnoppadol, 2009). Dr Chanvit
Pornnoppadol (2009), psychiatrist at Siriraj Hospital, Thailand, noted that
psychiatrists could diagnose children by checking children’s individual profiles in
detail, administering a nervous system test and through behavioural observation. In
the past blood tests and brain x-rays were used to diagnose children with ADHD.
However, these approaches have not been used recently. In some cases, visual
tests, hearing tests, learning achievement tests and IQ tests are used as instruments
to separate other disorders from ADHD.

**Socio-Economic Background of Children with ADHD**

Attention Deficit Hyperactivity Disorder is a common psychological disorder of
childhood (Minde et al., 2003). It can occur in all countries, ages, genders, cultures
and religions and occurs more frequently in males (2:1) than in females (9:1) (APA,
2000). Moreover, DSM-IV notes that there is a 3-7% prevalence of ADHD in school-
aged children.

In Thailand 5% of children are diagnosed with ADHD (Pornnoppadol, 2009). As
mentioned earlier that means that in a classroom of 50 students, approximately 2-3
students may have ADHD. Trangkasombat (2008) studied the clinical characteristics
of ADHD in Thai children using a retrospective study conducted between January
2002 and December 2003. The study found that most of the clients who came to a child mental health clinic in Bangkok were from middle to high socioeconomic status backgrounds and came from small families with 1-2 children. Moreover, patients were more frequently males than females, the ratio of males to females being 3.4:1 (Trangkasombat, 2008).

**Therapeutic approaches to the treatment of ADHD**

There have been many approaches to the treatment of ADHD. Nevertheless, a multimodal treatment is the most effective way to treat this disorder. This treatment approach consists of elements that work together and support each other to produce the best results for children with ADHD (National Resource Center on AD/HD, 2011; Pornnoppadol 2009; National Institute of Mental Health, 2008) and includes behaviour management, stimulant medication and educational program (National Resource Center on AD/HD, 2011). The most common medication used for treating ADHD is a ‘stimulant’ (NIMH, 2008). The symptoms of hyperactivity and impulsivity can be decreased by ADHD medication. These medications also improve children’s ability to work and study, especially by assisting their physical coordination (NIMH, 2008). In Thailand medications shown to be the most effective with children who have ADHD are methylphenidate (Ritalin), long-acting methylphenidate (Concerta), dextroamphetamine (Dexedrine), Adderall and pemoline (Cylert), all belonging to the category of psychostimulants (Pornnoppadol, 2009).

Another form of intervention is behavioural therapy. The purpose of this technique is to help children change their behaviour by increasing their positive behaviours and decreasing their problematic behaviours (NIMH, 2008; Sumamal, 2006; Weibe, 2007). In Thailand behaviour modification is used in combination with stimulants (Jamfa, 2000; Pamonkul, 2007; Pornnoppadol, 2009; Sumamal, 2006). Parents, teachers and doctors work together in order to exchange information and consult about children’s behaviours to produce the best outcome (Pornnoppadol, 2009 & Sumamal, 2006). Normally a behavioural therapy approach is used in various locations including the school, the home and other locations (Weibe, 2007).
Educational support services are important in helping children with ADHD to learn effectively (Pamonkul, 2007). Sumamal (2006) points to three main factors which influence treatment: (1) the teachers, (2) subject areas and (3) the classroom environment. Schools, therefore, should provide classrooms that are appropriate for the children. The number of the students in each class should be small and sometimes one-on-one teaching may be used (Pamonkul, 2007). These educational support services help children increase their ability to learn efficiently.

Other therapeutic approaches such as art therapy, activity therapy, concentration and imagination activities and music therapy have been used to treat children who are diagnosed with ADHD. Several studies have researched the results of using alternative applications (Jamfa, 2000; Kanjanasrikul, 2004; Narkprasong, 2005; Pamonkul, 2007; Weibe, 2007). It was found that children with ADHD will get more attention, develop their abilities and will also show better behaviour when being treated with other therapeutic approaches combined with medication. Medication, or the stimulant, used to treat children with ADHD is believed to have a relaxing effect on patients. It was found that the stimulant decreases hyperactivity and impulsivity (NIMH, 2008). This is relevant when considering the impact of music. Gabrielsson noted that “tones with few, low harmonics may be associated with pleasantness, boredom, happiness or sadness” (2009, p. 144). In Thai music, the timbre of the Ranad-ek is soft yet clear and bright when played with soft mallets and many pieces of music use a pentatonic scale. This infers that the Ranad-ek could possibly induce happiness and affect the attentional function in the brain via neurochemical responses. This was presented in a study examining the effect of major and minor modes on stress. In this study it was found that the major mode reduced stressful functions such as mental fatigue. The sound affected emotional responses that interlinked with attentional functions (Suda et al., 2008).

There have been studies that have used music as a tool to modify the behaviours of children (Rickson, 2004; Comwatjanung, 2001). Rickson (2004) studied the effect of instructional and improvisational music on the impulsive behaviours of adolescents with ADHD. It was found that where music instruction or improvisation was able to decrease restless and impulsive behaviours, there was no statistical different
between both instructional and improvisational music. Comwatjanung (2001) studied the effect of Thai music practice on aggressive children and found that children who practiced Thai music over twelve sessions showed a decrease in their level of aggression.

Responses to Music

Discussion and consideration of responses to music can be described in relation to two functions - bodily responses to music and emotional responses to music. In the present study, music was used as an important tool to modify the hyperactive behaviours of children with ADHD. Therefore, the responses of participants to the music were observed during the study and discussed in order to understand the children’s behaviours.

Bodily responses to music can be understood in terms of physiological responses and physical responses (Hodges, 2009). Physiological responses refer to internal bodily processes such as heart rate, blood pressure and blood chemistry. Physical responses are external and easily observable, for instance head nodding and feet tapping. These physical responses occur naturally, irrespective of musical training.

With regard to physiological responses, it is known that music affects heart or pulse rate, skin conductivity, blood pressure, biochemical responses, respiration, body temperature, muscular tension, blood volume and gastric motility (Hodges, 2009, pp. 122-124). Physical responses can be seen when human bodies respond naturally with movement, such as foot tapping and head nodding (Hodges, 2009, p. 126). The audiomotor systems are interlinked between music and people’s responses. Music can elicit and promote strong motor responses; for example people tap fingers along with rhythms they hear, which is known to change when changes to tempo are made (Tecchio et al., 2000, cited in Hodges, 2009).

Emotional responses to music can be described in terms of three factors: musical factors, individual factors and situational factors (Juslin, 2009). In terms of the musical factor, it is believed that while music is involved in the expression and perception of different emotions, it is difficult to find the link between music and
emotions (Juslin, 2009, p. 131). In the second factor, that is individual factors, the emotional responses to music are affected by individual factors such as “age, gender, personality, music training, music preference and current mood” (Abeles and Chung, as cited in Juslin, 2009, p. 135). The stronger emotional responses related to familiarity with the music (Bartel, as cited in Juslin, 2009, p. 135). The last factor influencing emotional responses to music, that is situational factors involve musical events, social factors (listening alone or with others), special occasions as well as the performance condition (Juslin, 2009). It can be claimed, therefore, that various situations affect the prevalence of emotions.

The frequency of emotional responses to music relates to happiness, love, calmness, sadness and excitement (Juslin and Lauka, as cited in Juslin, 2009, p. 133). Additionally, people who listen to music tend to be more positive, alert and focused on the present throughout the music experiences (Sloboda et al., as cited in Juslin, 2009, p. 133).

**A Brief History of Thai Music**

The following brief history of Thai music is presented to elucidate the cultural significance of the Ranad-ek and its potential therapeutic implications.

The history of Thai music can be described according to each kingdom. These are the Kingdom of Sukhothai, the Kingdom of Ayutthaya, the Kingdom of Thonburi and the Modern Kingdom of Thailand, or Kingdom of Rattanakhosin. It can be assumed that some aspects of Thai music and instruments have been influenced by other countries while some instruments have been invented by the Thais themselves. For example, many instruments from other nations were integrated into the different ensembles of Thai music (Dokmai, 2003; Srisukon, 1996; Office of the National Culture Commission, 2010). Also Thai musical styles have been influenced by music from different countries. Pieces of music influenced by the style of music from a particular country can adopt the country’s name and some melodic and rhythmic aspects (Pikulsri, 1987).
In the Kingdom of Sukhothai (year 1249-1438), there is historical evidence, called ‘a stone inscription’, which shows that the Thais were happy to play music and sing songs at that time. Many types of instruments were recorded in this stone inscription such as horns, a metal drum and a Kangsadal (a bell that looks like a half moon). There was also a quintet ensemble called ‘Piphat’ (gamelan). This consisted of a Peguan pipe, a Gong Wong Yai (a percussion instrument consisting of small gongs of different pitches strung together in a semicircle), two types of double-headed drums and Ching (small cup-shaped cymbals). Moreover, some instruments, for example Kra Jup Pi (Thai Guitar) and Saw Sam Sai (a fiddle with three strings), were found in this kingdom (Dokmai, 2003; Comwatjanung, 2001).

In the Ayutthaya Kingdom (1350-1767) there were three types of ensembles. These were the Piphat ensemble (gamelan) that contained five instruments similar to the Sukhothai, the stringed band which consisted of a Saw Duang (a treble fiddle), a Saw-U (an alto fiddle), a Jakae (roughly resembling a guitar), a Thai flute, a Tone (one-headed drum) and Ching (small cup-shaped cymbals). The third type of ensemble, the Mahori, consisted of woman playing the instruments which are a combination of percussions and strings and was conducted for the entertainment of the king only. In the later stage of this kingdom’s age, the Ranad-ek was added in the Piphat ensemble (Dokmai, 2003; Comwatjanung, 2001).

In the Kingdom of Thonburi (1767-1782), like in the Kingdom of Ayutthaya, there were still three ensembles. However, other instruments came to Thailand from Myanmar, Cambodia, Vietnam and Western countries (Dokmai, 2003; Comwatjanung, 2001).

In the Modern Kingdom of Thailand, or Kingdom of Rattanakhosin (1782-present), an increasing number of instruments in each ensemble appeared. Examples included the Gong Wong Lek which has a higher pitch than the Gong Wong Yai, Ranad-thume (similar to Ranad-ek but a low pitch), Pi-nok (kind of Thai flute), Ranad-ek-lek (iron Ranad-ek) and Ranad-thume-lek (iron Ranad-thume). Thai music institutions were at their most prosperous between 1910 and 1925, or in the 6th King of Chakri dynasty age. There were many famous musicians who composed
songs which are still played today. In 1934 King Rama VIII, also known as King Anantamahidol, established the College of Dramatic Arts and this was the first time that Thai music became part of the educational system of the Thai government. In the present reign (1946-present), King Rama IX has a multitude of duties related to Thai Music and he has also supported and encouraged Thai music study. In addition, the prince and princesses have been inspired to study this music (Dokmai, 2003; Iamyung, 2006; Comwatjanung, 2001).

It can be seen, therefore, that the Ranad-ek was brought into ensembles from the 1350s, or in the Ayutthaya Kingdom. After that the Ranad-ek played an important role in the Piphat and Mahori ensembles as a leader. These ensembles played Thai music as part of Thai people’s daily lives and in ceremonies from birth to death such as the first hair shaving ceremony, topknot shaving ceremony, initiation ceremony, weddings and funerals (Phukaothong, 1996).

The relationship between Thai music and Thai people has included the Ranad-ek becoming used as a therapeutic tool. For example, in the age of King Rama V, in the Rattanakosin Kingdom, there is evidence that the Mahori ensemble played in front of the king’s bedroom in order to lull and increase relaxation (H.R.H. Princess Mahachakri Sirindhorn Thai Music Library, 2010).

**The Elements of Thai Music**

The structure of Thai music can be explained in terms of rhythm and time, melody, texture and forms (Pikulsri, 1987). The effect of listening to and playing songs is based on melody and time. According to the elements of rhythm and time, the rhythm of Thai music can be studied in two situations. These are the rhythm of Ching (cymbals) and the rhythm of the drum (Pikulsri, 1987).

Ching, or cymbals, are made from brass and have a small cup-shape. Although Ching is one of several percussion instruments, the rhythm of Ching is most important when playing Thai pieces. Ching take the role of conductor in an ensemble and make sounds to determine the tempo and duration of Thai music.
This instrument can be played in two sounds - Ching and Chub (Pikulsri, 1987) - the sound of Ching is high, sonorous and bright while Chub is low, thick and heavy.

When played with Ching the rhythm of the drum acts as a time controller. These rhythmic patterns are short, uncomplicated and played repeatedly over and over. There are many rhythmic patterns of drum depending on the type of pieces (Pikulsri, 1987).

The melody of Thai music is understood from two different perspectives; these are singing on the one hand and playing on the other (Pikulsri, 1987). Singing the melody means vocal singing of the theme melody without variation in the same pattern as the playing of the Kong Wong Yai (a circle of pitched gongs made from brass) which is the main instrument in the ensemble. Playing the melody means playing variations in different styles depending on the instruments. The musicians, apart from the musician playing Kong Wong Yai, play the variations from the theme melody. The musicians who play the variations can also play the full melody based on the theme melody. This is achieved with special techniques such as using cross-hand playing (Kaeosri 1990; Pikulsri 1987).

There are two kinds of harmonic texture in Thai music - monophony and heterophony (Pikulsri, 1987). Most Thai songs are played in heterophony with the musician playing the Gong Wong Yai playing the theme melody while the other musicians playing the other instruments perform the full melody with variations. Kong Wong Yai is the main instrument in the ensemble which is used to play the theme melody. The other instruments are used to play the variations based on the theme melody.

According to Pikulsri (1987) Thai music sectional forms can be categorised in eight types:

1. **AA** - there is one melody played twice;
2. **AB** - there are two sections and each section has a different melody;
3. **ABC** - there are three sections and each section has a different melody;
4. **ABCD** - there are four sections and each section has a different melody;
5. ABCDE - there are five sections and each section has a different melody;
6. ABACADAEA - there is a returning theme that is like the rondo in Western music;
7. Introduction - the songs start with an introduction;
8. Songs after the main song - there are short songs that are played after main songs. There can be one or more short songs.

The Styles of Thai Music

Thai music can be categorised according to different styles, such as: ‘music for religion’, ‘music for dance’, ‘music for a dance drama’, ‘music for feeling’, ‘music for singing’, ‘music for movement’, and ‘music influenced by different countries’ where the names of each piece usually includes the country’s name (Pikulsri, 1987). Examples of pieces in the ‘music influenced by different countries’ include Lao Kra Sae (Laos), Bhamar Klong Yao (Burma) and Jean Jai Yo (China). Normally the ‘music influenced by different countries’ style is played as twelve pieces or one suite and it is called ‘twelve languages songs’, or ‘Pleang Sib Song Phasa’ (Pikulsri, 1987). The origin of this suite’s name is taken from a traditional story (Pikulsri, 1987) about a lady who had to choose her husband from men who were from 12 countries.

Another interesting point about ‘music influenced by different countries’ is the use of percussion instruments from different countries. For example, when playing songs in Western style, a snare drum or bass drum is used and when playing Chinese style, a Chinese drum is used (Pikulsri, 1987). All of the twelve songs have tempi ranging from Andante to Allegro (Pikulsri, 1987). The length of each song is short and the musical texture is uncomplicated. Most songs use pentatonic scales and are therefore familiar to Thai people. The forms of music influenced by other countries may have one melody or two melodies. Both forms are played in monophony (Kaeosri, 1990).

For the purpose of the present study, the style of music influenced by different countries was chosen for examination. It is more appropriate to use than other Thai song styles because of its characteristics of simplicity and pentatonicism. The other Thai traditional song styles are more complicated. In some styles, for instance music
for religion, music for a dance drama or music for movement, musicians have to participate in the ritual to pay respect to Thai musical instruments and Thai ancient masters. In the present study the simple style was used because in the ‘music influenced by different countries’ style the pieces are well-known in Thai culture and as a consequence the participants involved in the study could easily improvise them on the Ranad-ek.

The Ranad-ek

The Ranad-ek is one of many Thai traditional instruments. It has twenty-one to twenty-two wooden keys with high pitches (Janraksukhum, 2006). These wooden keys are strung together on a bridging set which is hooked on top of a long resonant box at both sides. This resonant box looks like a boat. The wooden keys are made from bamboo or a kind of hard wood called Mai Chingchan (Figure 1). The Ranad-ek is played as the leading instrument of an ensemble (Jinarak, 2008). It is usually played in two styles - Mai Khaeng playing with hard mallets, and Mai Nuam playing with soft mallets (Office of the National Culture Commission, 2010) (Figure 2). In this study Mai Nuam, or soft mallets, were chosen for playing the Ranad-ek. This is because soft mallets make light, clear, soft sounds which can evoke peaceful music while loud sounds made by Mai Khaeng, or hard mallets, can cause muscle contraction and spasm (Srisukon 1996). Soft mallets are made of cloths, thread and a piece of lead while the hard mallets are made from cloths and resin (Office of the National Culture Commission, 2010).

Figure 2: Soft and hard mallets for Ranad-ek (Office of the National Culture Commission, 2010)
Musicians playing the Ranad-ek can change scales easily because there is no semitone and the physical structure of the instrument allows musicians to change scales more easily than other instruments such as fiddles or flutes. Although most Thai songs are difficult to play, the Thai song style, of ‘music influenced by different countries’ is easy to listen to and play. It is usually found that most of the Thai songs in this style use pentatonic scales. It is easy to play the Ranad-ek because it can be performed with one or two hands and the shape of the Ranad-ek resembles a marimba. Both of these keyed percussion instruments have wooden keys arranged left to right, from the lower pitch to the higher pitch. This makes them simple to play.

Although the Ranad-ek is a traditional Thai instrument and has not been used as a therapeutic tool for ADHD symptoms before, it is possible that it would be appropriate for such a purpose because of the properties of its sound and the way it is played. The range of the Ranad-ek is three octaves starting with Sol and ending, depending on the composer, with Fa or Sol. In one octave there are seven equal tones which is different from Western musical systems which consist of twelve semitones (Figure 3).

![Figure 3: Western music and Thai music in regards to the pattern steps in the major scale of C (Pikulsri, 1987)](image-url)
Therapeutic Uses of Thai Music

Thai music has been used for therapeutic purposes since the 1990s (Dokmai, 2003; Iamyung, 2006; Srisukon, 1996; Comwatjanung, 2001). The subjects of various studies included normal children, aggressive children and young adults. It was found that Thai music could improve attention, learning achievements, mental calmness and relationships (Dokmai, 2003). For aggressive children, Thai music practice could decrease aggressive behaviour (Comwatjanung, 2001). Additionally, Thai music can help children to become more pleasant, responsible and confident (Srisukon, 1996). Another area where Thai music has been used for therapeutic purposes is Autism. The Occupation Training Centre Khun Poom Foundation (2010) organised Thai music activities for autistic people. A Thai music band that consisted of members with autism, called ‘Arun Chantra’, was created for the first time. It was discovered that when autistic people learnt Thai music their social interaction and expressive emotion were developed. Science Daily (2009) reported that children with Autism Spectrum Disorders developed in the areas of social communication, emotional functioning and musical development when participating in musical activities using the Orff method for 12 weeks. There has also been research using music with students with autism which involved them playing music with pentatonic scales and music related to Orff Schulwerk’s theory. It was found that this music was suitable in developing children in terms of communication and social interaction (Suppayaprapa, 2000).

There are percussion instruments other than the Ranad-ek that have wooden keys. These include the xylophone, marimba and the Orff-Schulwerk instruments, however the Ranad-ek has several properties which make it a suitable instrument for Thai people in terms of cultural context. In Thai culture, it is believed that Thai musical instruments are sacred items. Thai people respect instruments as if they are benefactors. For this reason bringing the Ranad-ek as a therapeutic tool into this study could be positive for Thai participants in terms of faith and belief.

Thai Musical Instruments are not merely objects which produce sound when played. To Thai people these instruments hold a deeper position within the Thai
culture because they are symbolic of all musical knowledge passed down from
generation to generation. Hence, Thai Musical Instruments are highly valued and
deeply respected by all Thais, especially by those associated with the Arts. As a
powerful symbol of musical knowledge people have developed the
Brahmanic/Hindu belief that certain Devas, Teachers or the Forerunners of Thai
Music reside within Thai Instruments. From this belief Thais will always ‘wai’ (a
gesture where one places both hands together at the chest in the shape of lotus
bud) before playing Thai Instruments and also hold annual ‘Wai Kru’ rituals, or the
rituals to pay respect to the Devas of Music, the Forerunners of Thai Music as well
as ones' teachers. This is also the case with headpieces and masks of Thai Dance
and the weapons used in Thai Martial Arts. It is necessary to note that as Buddhists,
Thais do not respect musical instruments in a manner that is materialistic or
animistic. Rather, the instruments are symbolic of the precious knowledge and
values of Thai music teachers who have preserved this art form to the present day.

The Ranad-ek was in an ensemble that was used as a therapeutic tool around 1905-
1906 when it was found that Thai music using the Ranad-ek and other Thai
instruments increased attention and relaxation and decreased anxiety and
depression (Srisopak, as cited in Comwatjanung, 2001). Therefore, it can be said
that it is possible that the therapeutic uses of Thai music and musical instruments,
and in particular, the Ranad-ek, could be one of the approaches used to treat
children who need to develop attention skills, especially Thai children with ADHD.

Thai music has been researched and has been found to be used in many contexts of
Thai life. Despite this little interest has been shown in Thai music’s therapeutic
potential. The Thai musical curriculum is assigned in primary schools (Office of the
Basic Education Commission, 2010). It is believed that all Thai students are familiar
with Thai traditional songs and instruments. Although music therapy is used with
children with special needs, in Thailand Western instruments are selected, even
when the use of Thai instruments is possible and better known. Therefore, the
challenge to apply Thai music in a music therapy setting is one which this study is
undertake. The Ranad-ek is especially suitable for such a study because it has
properties which include being accessible, portable and melodic. Learning the
Ranad-ek with a master also has advantages, including offering good eye contact between teacher and student, controlling the mallets with fine motor movement, closeness when playing and being simple enough for the beginner to make an effective sound. Finally, if the therapeutic use of Thai music proves successful, it would provide new knowledge about how to treat children who have been diagnosed with ADHD in Thailand using Thai music and Thai musical instruments.

While Thai music plays a part in many different aspects of Thai people’s lives, little has been done to understand the potential of Thai music to improve behaviour in Thai children. Even though the incidence of ADHD in Thailand has impacted Thai children in terms of their ability to learn and live, Thai music has not yet been chosen as a treatment modality. The present research investigated the use of Thai music to modify the hyperactive behaviours of Thai children with ADHD.

The Ranad-ek was chosen for its accessibility, portability, and easiness to improvise using the key elements of traditional Thai music. The music approaches that were selected in the present study were improvising on the Ranad-ek and listening to the Ranad-ek. The improvising of music is an approach adopted in several studies within and outside Thailand but none have adopted Thai music. Rickson (2004) stated that improvising music leads children to have more self-esteem, self-awareness and confidence (p.24). Suppayaprapa (2009) discussed how an improvement of children’s behaviours and relationship with others occurred through music-making interaction or improvising. There has been research using Thai music listening with movement activity to improve self-confidence in five to six year-old children and it was found that Thai music gave participants more confidence than the control group which received no treatment (Srisukon, 1996).

The present study aimed to investigate the effects of Thai music on hyperactive behaviours of children with ADHD. This was done by comparing interactive improvisation on the Ranad-ek with listening to the Ranad-ek. The style of music chosen for the investigation is known in Thai literature as ‘music influenced by different countries’ (MIDC). This style usually consists of Thai classical songs and is
generally familiar to the Thai population. Music in this style can be played in two different ways, generally referred to in Thailand as ‘happy’ and ‘sad’ moods.

The research question was: If and how playing and listening to Ranad-ek music in the styles ‘music influenced by different countries’ (Pikulsri, 1987) affects hyperactive behaviours of Thai children diagnosed with ADHD?
Chapter 3
Method

Participants

The participants were six (N=6) Thai boys living in Thailand between eight and ten years of age and diagnosed with ADHD. From DSM-IV-TR (APA 2010) all the children exhibited behaviours classified as either the Predominately Hyperactive-Impulsive Type, Predominately Inattentive Type or Combined Type. All the participants were members of a private club, an after-school tutoring program run in the capital city for children with special needs.

All participants were recruited by the advisors of the tutoring club under the conditions that:

   a) they were between eight and ten years old
   b) they had been diagnosed with the Combined Type of ADHD by the psychiatrist
   c) they had not been involved in a music program before
   d) they were not treated by medication because it may affect the occurrence of participants’ behaviours.

Before the study, 18 potential participants were identified in 10 different schools. One month before the commencement of the study, the potential participants’ parents, or caregivers, were given the Participant Information Sheet (Appendix F). The researcher organised a meeting for the parents and this was used to present the study and to answer all enquiries. There were eight participants who accepted all conditions and agreed to participate in the study. The researcher selected six participants based on the score of a modified version of the Conners’ Parent Rating
Scale. After that the parents and their children signed the Participant Consent Form (Appendix E).

The Participant Information Sheet and Participant Consent Form were translated in Thai.

For the purpose of the study participants were divided using random selection into two groups: (1) the improvising group (N=3) and (2) the listening group (N=3). Before the study commenced all participants were assessed by a modified version of the Conners’ Parent Rating Scales by their parents (Appendix A). Ethics approval for the study was obtained from the University of Western Sydney Human Research Ethics Committee on 4 April 2011 (H8867).

**Design**

Each of the two groups took part in two session per week conducted over a period of four weekends. The sessions lasted approximately 20 minutes each and were conducted on Saturdays and Sundays between 10.00a.m. and 11.00a.m. for the improvising group and between 1.00p.m. and 1.20p.m. for the listening group. The participants of the improvising group played along with the researcher on the Ranad-ek imitating the ‘sad’ and ‘happy’ moods. Four musical instruments were available for the researcher and the participants. In the listening group the researcher played the Ranad-ek while the participants were listening. In each session, the moods of the music were presented in a different order.

**Materials**

In the improvising group four Ranad-eks were used, one for the researcher and the others for the three participants. In the listening group only one Ranad-ek was used, which was played by the researcher.

The music consisted of four pieces of ‘music influenced by different countries’ in the ‘happy’ mood and four pieces in the ‘sad’ mood. The ‘happy’ pieces were ‘Bhamar Kuei’ (Burma), ‘Yosalum’ (Western), ‘Lao Long Nan’ (Laos) and ‘Lao Len
Nam’(Laos). The ‘sad’ pieces were ‘Lao Kruan’ (Laos), ‘Tayoi Yuan’ (Vietnam), ‘Lao Duang Duen’ (Laos) and ‘Yeepun Rum Peung’ (Japan).

**Personal Bias**

It is important to note that the author of the present study acted both as the researcher collecting data and the musician engaged with the children during the evaluated sessions. Whilst all precautions have been taken to minimise the bias potentially brought about by this dual involvement, it must be acknowledged that the duality of the researcher's roles could have affected the way the sessions have been conducted as well as evaluated. One of the possibilities is that the results concerning behavioural changes were interpreted with a degree of favouritism towards those participants who displayed more 'creative' or 'musical' ways of playing the instruments, or, on the other hand, that the researcher engaged in a more supportive way of improvising music with those participants who were demonstrating greater improvements in their behaviour. All the results of the present study, and its conclusions, have been presented and interpreted with this in mind.

**Procedure**

*Improvising Group*

During the first session the researcher introduced herself and briefly described the activity. Both the researcher and the participants sat behind the instruments so that they could see one another. Next the researcher talked about the Ranad-ek, its background and the way to play it. The researcher also explained the background of the music to be used. After that the researcher started playing the Ranad-ek and invited the participants to improvise. At the end of the session the researcher asked the participants how they felt about the activity. Commencing from session two the researcher only discussed the background of the music, then played the Ranad-ek while the participants improvised. At the end of the session the researcher also asked the participants how they felt about the activity. All sessions were video-recorded.
Listening Group

During the first session the researcher introduced herself and briefly described the activity. Next the researcher talked about the Ranad-ek, its background and construction. The researcher also explained the background of the music. After that the researcher started playing the Ranad-ek while the participants listened. At the end of the session the researcher asked the participants how they felt about the activity. Commencing from session two the researcher only discussed the background of the music, then played the Ranad-ek while the participants listened. At the end of the session the researcher asked the participants how they felt about the activity. All sessions were video-recorded.

In both groups the ‘sad’ and ‘happy’ pieces both played and listened to and were presented in a different order. Subsequently, ‘happy’ pieces were played in sessions one, three, five and seven, and ‘sad’ pieces in sessions two, four, six and eight.

Evaluation

Participants’ behaviours were assessed before and after the program by the parents of each student using a modified, Thai version of the Conners’ Parent Rating Scales (Appendix A). In addition, a behaviour observation form (Appendix B) was completed by the present researcher after viewing the video recording of each session.

The Conners’ Parent Rating Scales

The Conners’ Parent Rating Scales is a 48-item instrument used to assess problematic behaviour in children between three and seventeen years of age. It looks at six areas of behaviour: Conduct, Learning, Psychosomatic, Impulsiveness-Hyperactivity, Anxiety and Hyperactivity (Gianarris, Golden & Greene, 2001). The Thai modified version of this instrument was translated by Trangkasombat (cited in Sumamal, 2006) and Boriboon (1999) who researched the statistics and behavioural norms of Thai children. In the present study 10 assessment items of Hyperactivity Index were selected from the modified version:
(4) ‘Excitable, Impulsive’;
(7) ‘Cries Easily or Often’;
(11) ‘Restless in the Squirmy Sense’;
(13) ‘Restless, Always Up and On the Go’;
(14) ‘Destructive’;
(25) ‘Fails to Finish Things’;
(31) ‘Distractibility or Attention Span a Problem’;
(33) ‘Mood Changes Quickly and Drastically’;
(37) ‘Easily Frustrated in Efforts’;
(38) ‘Disturbs Other Children’

Each of the above listed target behaviors were ranked using 0 for ‘Not at all true’, 1 for ‘Just a little true’, 2 for ‘Pretty much true’ and 3 for ‘Very much true’.

*Behaviour Observation Form*

The Behaviour Observation Form (Appendix B) was created by the present researcher in order to assess the participants’ behaviour during the sessions. The form is, in principle, based on the Hyperactivity Index of a modified version of the Conners’ Parent Rating Scales, and looks at the following undesirable behaviours:

‘Restless and Fidgety’
‘Moving Around the Room’
‘Does Not Listen to Others’
‘Making Inappropriate Noises’
‘Talking When Not Necessary’

Each of the above listed behaviours was ranked using 0 for ‘Never’, 1 for ‘Occasionally’, 2 for ‘Often’ and 3 for ‘Very Often’.
Data Analysis

The means of scores of data obtained from a modified version of the Conners’ Parent Rating Scales were analysed and compared between before and after the program to determine at possible changes in the participants’ hyperactive behaviours. The parents of participants completed this test by rating their observing of participants’ behaviours. The range of ratings was ‘Not at all true’ (0), ‘Just a little true’ (1), ‘Pretty much true’ (2) and ‘Very much true’ (3) which depended on the frequency of the hyperactive behaviours.

In addition, the frequencies of the undesirable behaviours recorded during each session in the Behaviours Observation Form were presented as graphs in order to compare the ongoing trends and tendencies within both groups. This form was completed by the researcher rating the frequency of hyperactive behaviours from the video recorder. Finally, descriptive reports from each session were analysed and coded in order to seek extra qualitative information that might relate to the numerical results of a modified version of the Conners’ Parent Rating Scales and the Behaviour Observation Form.

All the results were analysed and described in a way that protects the confidentiality and anonymity of the children and teachers involved in the study.
Chapter 4

Results

Table 1 shows the means of pre and post test from the data in Appendix C of 10 target behaviours obtained from the Hyperactivity Index of a modified version of the Conners’ Parent Rating Scales, as recorded in the improvising group (N = 3), the listening group (N = 3) and both groups combined.

**Table 1: Pre and Post Means Scores of Occurrences of Target Behaviours**

<table>
<thead>
<tr>
<th>Target Behaviours</th>
<th>Improvising Group</th>
<th>Listening Group</th>
<th>The Whole Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre</td>
<td>Post</td>
<td>Pre</td>
</tr>
<tr>
<td>Excitable, Impulsive</td>
<td>2</td>
<td>1.33</td>
<td>2.67</td>
</tr>
<tr>
<td>Cries Easily or Often</td>
<td>1.67</td>
<td>1.33</td>
<td>1</td>
</tr>
<tr>
<td>Restless in the ‘Squirmy’ Sense</td>
<td>2.67</td>
<td>2.67</td>
<td>2.33</td>
</tr>
<tr>
<td>Restless, Always Up and On the Go</td>
<td>2.67</td>
<td>2</td>
<td>2.67</td>
</tr>
<tr>
<td>Destructive</td>
<td>1.33</td>
<td>0.67</td>
<td>1.33</td>
</tr>
<tr>
<td>Fails to Finish Things</td>
<td>2.67</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Distractibility or Attention Span a Problem</td>
<td>3</td>
<td>2.67</td>
<td>3</td>
</tr>
<tr>
<td>Mood Changes Quickly and Drastically</td>
<td>1.33</td>
<td>1.33</td>
<td>1</td>
</tr>
<tr>
<td>Easily Frustrated in Efforts</td>
<td>1.67</td>
<td>1.67</td>
<td>2</td>
</tr>
<tr>
<td>Disturbs Other Children</td>
<td>2</td>
<td>1</td>
<td>1.33</td>
</tr>
</tbody>
</table>
As can be seen, the frequency with which ‘Excitable, Impulsive’ behavior occurred in both groups change in the same. This trend has also been observed in the descriptive reports which show that participants in the improvising group tried to play the Ranad-ek before the teacher gave permission, and some talked loudly and interrupted when the others were playing in sessions one and two (Appendix D, pp. 66-67). In session 8 one of the participants kept telling the teacher that he would like to play more after finishing the program (Appendix D, p. 71). As for the listening group, one of the participants chose not to take part in the activity until his advisor came to sit with him. However, he could sit only for a minute and then stood up and hit the advisor.

As shown in Table 1, the occurrence of ‘Cries Easily or Often’ was also the same the change for both groups.

With ‘Restless in the Squirmy Sense’, there was no change in either of the two groups, with a reduction recorded only in one participant in the listening group. The descriptive reports show that the participants in the improvising group could not wait or stay without being restless and fidgety (Appendix D, p. 68 and 69). In the listening group, some participants dragged their fingers on the floor while they were listening. Sometimes they used stationary knocking on the Ranad-ek. One child could not sit on the floor but always stood up and moved around (Appendix D, pp. 72-77).

Similarly, in ‘Mood Changes Quickly and Drastically’ only one participant in the improvising group demonstrated a reduction while the rest of the group remained the same. As can be seen in the descriptive notes (Appendix D, p. 67) one participant in the improvising group was initially shy and afraid to play. Later he created a way of playing which was very different from the others, such as beating with one hand, using the right hand across the left and sliding the mallet over the wooden keys. In session four, two of the participants had an argument because one thought the other made loud noises and looked childish. After that the maker of the loud noises made an inappropriate noise again and used the mallets to hit the Ranad-ek loudly (Appendix D, p. 69). In session six, while participants were
improvising, one of them lay down on the floor for a minute and then improvised with the others again (Appendix D, p. 70). It was also shown in the listening group that one of the participants ran into another one in session seven while the others were listening to music. Another time in session eight this same participant kicked the others when he lay down on the floor (Appendix D, pp. 76-77).

With regard to ‘Restless, Always Up and On the Go’ the improvising group showed a slightly higher reduction than the listening group. Similarly the frequency of ‘Destructive’, ‘Fails to Finish Things’ and ‘Disturbs Other Children’ behaviours had a greater reduction within the improvising group. According to the descriptive report, participants in the listening group often stood up and walked and crept around the room. Sometimes they jumped and danced. One of participants never sat down. Even though this particular behaviour had decreased by session five it was repeated frequently after session six (Appendix D, p. 76).

With reference to being ‘Destructive’, the descriptive reports suggest that some participants in the improvising group were beating the Ranad-ek too loudly and too heavily in sessions one and five. When the Ranad-ek was hit heavily the plugs of lead\(^1\) dropped down. In session two one of the participants played the instrument inappropriately, for example beating on an area of the instrument that is generally not played on. However, in session seven that same participant had much better control, especially in relation to holding the mallet (Appendix D, p. 71). In the listening group, during session eight one of participants sat on the instrument and hit it without permission (Appendix D, p. 77). In Thai culture this would generally mean that the participant did not respect the instrument.

With the behaviour ‘Disturbs Other Children’ it was observed that participants in the improvising group interrupted others in sessions one, three and four (Appendix D, p. 67, 68 and 69). Sometimes they used the mallets to beat on others’ instruments. However, this behaviour had decreased in sessions seven and eight. In the last session, one of the participants still interrupted others but stopped after

---

\(^1\) The plugs of lead are inserted underneath the wooden keys of Ranad-ek for tuning. In order to tune the pitches, the middle of wooden keys is normally shaved off add and the pieces of lead are placed at two sides.
realising that this was the last class (Appendix D, pp. 70-71). With the listening group, the disruptive participants did not only interrupt the other children, they also interrupted the teacher. One of the participants sat down beside the teacher and, using a pencil, was knocking on the Ranad-ek while the teacher was playing music. Moreover, they often made inappropriate noises and screamed (Sessions two, four, five, six and seven; Appendix D, pp. 73-76).

As can be seen in Table 1, the frequency of ‘Distractibility or Attention Span a Problem’ had decreased more in the listening group than the improvising group. Conversely looking at the descriptive reports one can see that the participants in the improvising group paid more attention to the teacher when, in sessions five to eight, the researcher told them about the musical pieces’ background (Appendix D, p. 67 and 72). In the listening group two participants kept looking at the recorder and sometimes they stood in front of the camera to hide it. These two participants always copied each other’s behaviour. For example, in session four, one participant came to the teacher and knocked on the wooden keys, then the second participant did the same and in session seven when the first participant stood up the other one did too. In that group only one participant could concentrate on the music; he sat and listened even when the others invited him to play with them (Appendix D, p. 74 and 76).

For the ‘Easily Frustrated in Efforts behaviour’ participants in the listening group showed a decrease in its occurrence while the improvising group stayed the same.

In order to examine the ongoing behavioral changes a behaviour observation form was used (Appendix B). Figure four shows the occurrences of ‘Restless and Fidgety’ recorded consecutively in the improvising and listening groups over the duration of the research.
Figure 4: Consecutive occurrences of ‘Restless and Fidgety’ recorded in the improvising and listening groups.

As can be seen, the incidence of this behavior reduced slightly in the improvising group after session four, with a substantial decrease from session six onwards. The listening group reached a peak of this behavior at 2.67. These trends can also be seen in the descriptive notes. In session one participants in the improvising group could not wait or stay still without being restless and fidgety. In session five, although one participant was not able to listen when the teacher was explaining the background of the music, he could listen to the music without fidgeting (Appendix D, p. 70). For the listening group, in all sessions, the participants were fidgety and even at times jumped and danced. In session one, when listening to the music, one participant always dragged his fingers on the floor and in session four he knocked on the instrument during the teacher’s playing. He also always stood up and shook his hands (Appendix D, p. 72 and 74).
Figure 5: Consecutive occurrences of ‘Moving Around the Room’ recorded in the improvising and listening groups.

Figure five shows the occurrences of ‘Moving Around the Room’ recorded consecutively in the improvising and listening groups over the duration of the study. As can be seen, during most sessions the improvising group did not exhibit this particular behavior. This was different for the listening group where the behavior fluctuated. As it is recorded in the descriptive notes, two participants in the listening group often walked around the room; sometimes they also ran, crept or rolled on the floor (Appendix D, pp. 74-76).

Figure six shows the consecutive occurrences of ‘Does Not Listen to Others’.
Figure 6: Consecutive occurrences of ‘Does Not Listen to Others’ recorded in the improvising and listening groups.

Figure six shows that from session one the incidence of the behaviour ‘Does Not Listen to Others’ in both groups gradually decreased, with a more prominent reduction observed in the improvising group. Descriptive reports further illustrate that from session three onwards participants in the improvising group focused on their instruments and played independently. Some participants improvised seemingly without caring about the dynamic and rhythms but, after a while, they played lighter and slower (Appendix D, p. 68). Participants in the listening group normally had independent behaviours. One of them never sat down, one walked around the room and the third sat leaning against the wall. Their behaviours were not related to one another and they did not interact with each other (Appendix D, pp. 72-76).

Figure seven shows the consecutive occurrences of ‘Making Inappropriate Noises’ recorded in the improvising and listening groups.
**Figure 7:** Consecutive occurrences of ‘Making Inappropriate Noises’ recorded in the improvising and listening groups.

As can be seen on the graph in figure seven the scores for both groups in relation to the behaviour of ‘Making Inappropriate Noises’ fluctuated. With the improvising group, the incidence of the behavior reached the mean of 2.33 and then sharply decreased. By the end of the study (session eight) it had slightly reduced. In contrast, in the listening group the frequency of this behaviour increased after session six. This has also been seen in the descriptive reports which show that during session two one participant played the instrument inappropriately. The participant used the mallets to beat on an area of the Ranad-ek that is normally not played on and he also hit the others’ instruments (Appendix D, p. 68). With the listening group, two participants often made inappropriate noises and interrupted one another. In session two, one participant made loud noises and screamed. Another participant stamped his feet and jumped, he also barked like a dog and sometimes shouted. It has been noted that after session five the participants made less inappropriate noises, however, after session six the incidence of this behavior increased. One of the participants interrupted the teacher by knocking on the Ranad-ek when the teacher was playing (Appendix D, p. 73 and 76).
Figure eight shows the consecutive occurrences of ‘Talking When Not Necessary’ recorded in the improvising and listening groups over the duration of the research.

![Graph showing consecutive occurrences of 'Talking When Not Necessary' in improvising and listening groups.]

**Figure 8:** Consecutive occurrences of ‘Talking When Not Necessary’ recorded in the improvising and listening groups.

As the graph shows, the behaviour of the improvising group peaked at 2.33 in session two then sharply fell and continued to fall from session four to the end of the research. In the listening group between sessions three and five the occurrence of this behavior remained at the same level, then it rose sharply in session six. Descriptive reports show that one of the participants in the improvising group often interrupted others when they were improvising; he talked loudly and swore (Appendix D, p. 69). In the listening group, two participants often interrupted the others and the teacher; they also talked amongst themselves about things that were not related to music or what the teacher had asked (Appendix D, p. 76).

In summary, according to the results of a modified version of the Conners’ Parent Rating Scales, there was a slight reduction in the frequency of most hyperactive behaviours in both groups, while the data obtained from the Behaviour Observation Form suggested that the behavioral improvements were greater within the improvising group.
Chapter 5
Discussion

The present study aimed to investigate the effect of Thai music, and specifically ‘Influenced by Different Countries’, on hyperactivity in Thai children with ADHD. It compared interactive improvisation on the Ranad-ek with listening to the Ranad-ek. The hyperactive behaviours of six participants from the improvising and the listening groups are discussed in this chapter. The target behaviours were identified using ten items of the Hyperactivity Index of Conners’ Parent Rating Scales. These were ‘Excitable, Impulsive’, ‘Cries Easily or Often’, ‘Restless in the Squirmy Sense’, ‘Restless, Always Up and On the go’, ‘Destructive’, ‘Fails to Finish Things’, ‘Distractibility or Attention Span a Problem’, ‘Mood Changes Quickly and Drastically’, ‘Easily Frustrated in Efforts’ and ‘Disturbs Other Children’. Each group of participants, improvising and listening, consisted of three boys aged eight to ten.

The American Psychiatric Association (2010) divides the type of ADHD into three subtypes and the participants were all in the combined subtype that meant they displayed behaviours in both the Predominately Inattentive Type and the Predominately Hyperactive-Impulsive Type. This subtype is “the most common and the most severe form” (American Academy of Child & Adolescent Psychiatry, 2010). The various behaviours of the combined subtype include failure to complete tasks, messy work, fidgeting, inappropriate running and impatience.

Before taking part in the study, participants’ behaviours were assessed, by their parents, using a modified version of the Conners’ Parent Rating Scales. To select the participants to take part in the program the T-score of a modified version of the Hyperactivity Index of Conners’ Parent Rating Scales for each participant was compared with eight to ten years old Thai children without ADHD. Children without
ADHD generally have a T-score of approximately fifty while children with ADHD approximately eighty and this latter situation was the case for the children chosen for this study. That means the participants displayed hyperactive behaviours more frequently than children without ADHD. In the results of this study, the behaviours that were presented the most frequently, when considering the Hyperactivity Index of Conners’ Parent Rating Scales, were ‘Restless, Always Up and On the Go’, ‘Restless in the Squirmy Sense’, ‘Excitable, Impulsive’ and ‘Fails to Finish Things’. Most of the behaviours that the participants always displayed were in the Predominately Hyperactive-Impulsive Type, excepting the ‘Fail to Finish Things’ behaviour.

As part of the Thai music activities, the Ranad-ek was used as a tool in the present study. It was used actively through improvisation and passively when the children were required to listen to the music. This research was designed to use the Ranad-ek in a situation not tried before in previous studies. Several studies (Iamying, 2006; Srisukon, 1996; Comwatjanung, 2001; Dokmai, 203; Occupation Centre Khun Poom Foundation, 2010) have presented the effect of Thai music on Thai children who are ‘normal’ children, aggressive children, autistic children and young adults. The approaches with Thai music these studies adopted were multifarious and included engaging participants in music practice, in music and movement and in rhythmic activities. The results of these studies showed how music advantages and benefits children. Even though the present study’s results show positive findings in relation to the use of Thai music and the Ranad-ek, there were limitations in this study which are presented in the discussion below.

There are many reasons why music should be used as a treatment for children with ADHD. Although there is little literature about the treatment of ADHD through music therapy, it has been found that music therapy can reduce hyperactivity and other unwanted behaviours (Jackson, 2003). In this current research it is evident that Thai music can decrease the incidence of hyperactive behaviours for these particular participants such as impulsivity, restlessness and disturbing others and this has been shown in both listening and improvising groups. It was interesting to
note that the Ranad-ek, as a music tool, is suitable for Thai children in terms of its dimension, sound, playability and tradition.

**Improvising Approach**

The participants who were placed in the improvising group were three boys who were diagnosed with ADHD. Of the ten hyperactivity behaviours studied, half were in Predominately Hyperactive-Impulsive Type, which contained ‘Excitable, Impulsive’, ‘Restless in the Squirmy Sense’, ‘Restless, Always Up and On the Go’, ‘Destructive’ and ‘Disturbs Other Children’. The other behaviours were in the Predominately Inattentive Type.

Literature on research using music therapy methods, and their role in the treatment of early elementary school children with ADHD, recorded that improvising was the second most frequently used approach in music therapy methods employed by board-certified music therapists in America (Jackson, 2003). When this approach was used in the present study using Thai music and specifically the Ranad-ek, it was found that the participants taking part in the improvising group had no difficulties with improvising on this instrument. The best way to play the Ranad-ek was found to be best when the children sat on the floor and faced the teacher. In this position the participants could not move and had to sit and play in the limited space and this positively affected their hyperactive behaviours.

It was noted in the results of the present study that the frequency of hyperactive behaviours in the Predominately Hyperactive-Impulsive Type was reduced except for the ‘Restless in the Squirmy Sense’ behaviour which was expected to be reduced as well. In addition, it was found that two-third of participants had a reduction in occurrences of the four hyperactive behaviours in Predominately Hyperactive-Impulsive Type - ‘Excitable, Impulsive’, ‘Restless, Always Up and On the Go’, ‘Destructive’ and ‘Disturbs Other Children’.

There was, however, no change in the ‘Restless in the Squirmy Sense’ behaviour throughout the duration of the program. This would be because of the clinical symptoms of this disability. Some characteristics, such as an inability to stay attentive, impulsivity and/or motor restlessness, cannot be controlled by children with ADHD. However if there was a
large number of participants, it would be possible that Thai music would affect this behaviour also. Moore (2009) states that children with ADHD should have music activities that allow them to concentrate. For instance, if the children cannot sit still he suggested to let them play instruments that they have to sit down in order to play. This comment of Moore’s was supported by the results of this present study in that there was a reduction of 18.73% in the incidence of ‘Restless, Always Up and On the Go’ behaviour. In relation to the ‘Moving Around the Room’ behaviour, from the Behaviour Observation Form scored by the researcher as the music teacher, it appeared that in all sessions the participants did not walk or move anywhere except in session three which showed a very low score (Figure 5).

Although the behaviour ‘Restless in the Squirmy Sense’ remained the same when evaluated by the parent throughout the duration of the program, it decreased in occurrence in the Behaviour Observation Form as the graph reveals in Figure four. For example, from the descriptive reports, the participants could control themselves to improvise and listen to the teacher from session five onwards, which was better than previously (Appendix D, p. 70). It can be seen that even though the frequency of these behaviours was reduced while undertaking the improvisation activity, the participants still displayed unwanted behaviours after the session. The reason for this result might be explained by the symptoms of this disorder, because although the instrumental improvisation method aimed to treat children with ADHD, in order to meet the behavioral goals (Jackson, 2003) the program needed more time and frequency to develop and change the children’s behaviour.

The ‘Excitable, Impulsive’ behaviour is the basic action of ADHD. The impulsive behaviours, including not listening to others, interrupting, disturbing other children and talking when not necessary, are always found in children diagnosed as ADHD. For example, the participants in the improvising group often played on the Ranadek before the teacher gave them permission or they interrupted others while improvising (Appendix D, pp. 66-67). It was noted in the results from Conners’ Parent Rating Scales, however, that the incidence of this ‘Excitable, Impulsive’ behaviour was lessened to 33.5% and two participants had a decreased frequency of this behaviour.
Hodges (2009) states that music can affect human bodies in terms of physiological and physical responses. With regard to physical responses, it can be seen that human bodies will respond naturally with movement when they listen to or play music. In the present study, when participants were improvising with the teacher they did not have as high an incidence of ‘Excitable, Impulsive’ and ‘Disturbs Other Children’ behaviours. Improvised music activity, therefore, might minimise their unwanted behaviours. The children improvised along with the teacher, and while they were improvising the frequency of the ‘Excitable, Impulsive’ and ‘Disturbs Other Children’ behaviours were reduced. As can be seen in the results, in Figure six, seven and eight, it was found, using the Behaviours Observation Form, that the frequency of ‘Does Not Listen to Others’, ‘Making Inappropriate Noises’ and ‘Talking When Not Necessary’ behaviours decreased significantly from session four onwards.

‘Destructive’ behaviour, the last Predominantly Hyperactive-Impulsive Type examined, was engaged in twice during the improvising sessions by one participant. The other two participants in the improvising group, however, reduced the frequency of this behaviour and overall the score, from a modified version of the Conners’ Parent Rating Scales, was decreased by 49.62% after the study. This reflects the cited literature in which Comwatjanung studied the effect of Thai music practice and found that it could decrease aggressive behaviour (Comwatjanung, 2001).

The other behaviours in Predominately Inattentive, which consisted of ‘Cries Easily or Often’, ‘Fails to Finish Things’, ‘Distractibility or Attention Span a Problem’, ‘Mood Changes Quickly and Drastically’ and ‘Easily Frustrated in Efforts’, reduced in frequency, apart from the ‘Easily Frustrated in Efforts’ behaviour for which the incidence remained the same.

Some behaviours in the Predominately Inattentive Type were quite difficult to measure during each session. For example, ‘Cries Easily or Often’ and ‘Mood Changes Quickly and Drastically’ are categorised in cognitive and emotional terms that were hard to evaluate and develop in the limited time of this study. In the
Conners’ Parent Rating Scales, however, the occurrence of ‘Cries Easily or Often’ was reduced to 20.36% and there was one participant that had a frequent reduction in this behaviour.

Regarding the ‘Fails to Finish Things’ behaviour, the act of improvising was a lesson which taught participants to finish a task. Moore (2009) claimed that children with ADHD cannot finish their jobs because they keep talking, walking and interrupting. The way to solve this problem is to plan a lesson that cannot be done if they are talking of walking. Since improvising required sitting and playing instruments it led the participants to the goal without difficulty. The music teacher was a leader who encouraged them to complete the task assigned and played music which supported them to concentrate.

It is for this same reason that the frequency of ‘Distractibility or Attention Span a Problem’ and ‘Easily Frustrated in Efforts’ were reduced. Music improvisation encouraged participants to focus on the thing that they were doing without becoming frustrated. Participants and the teacher finished the pieces together. In some sessions, the participants asked the teacher to play more (Appendix D, p. 67). It is known that behavioural improvements are likely to evolve over a period of time. Although there was no frequency change in ‘Easily Frustrated in Efforts’, one participant enacted ‘Distractibility or Attention Span a Problem’ less frequently than before.

In Thai culture, Thai people believe that there are Devas, Teachers or the Forerunners of Thai music within the Thai instruments and this belief has been passed down from generation to generation. This reason may answer why participants, who were all Thai, respected the teacher and instruments by sitting and playing music without becoming frustrated. Also, the belief that the instrument was a sacred item may motivate participants to finish task easier.

In summary, these particular participants in the improvising group showed reduced frequency of problematic behaviours after taking part in the program. The behaviours that were positively affected the most were in the Predominately Hyperactive-Impulsive Type. However, the incidence of behaviours that were
emotional and cognitive by nature had a small reduction and some behaviours stayed the same.

**Listening Approach**

The participants in the listening group were another three boys with ADHD who had not been treated with medication and music therapy before. In this group, the participants just listened to the Thai music that the teacher played on the Ranad-ek and the hyperactive behaviours were recorded.

According to literature, music listening is an interesting tool to treat children with ADHD. For example, Montello and Coons (1999) stated that music listening or passive music might benefit children with ADHD more than active music because the children are not controlled by playing music. In the present study it was recorded that while listening to Thai music participants could join the activity in the ways they wanted to such as dancing, foot tapping or jumping (Appendix D, p. 73-74).

In the next section of this chapter the effects of listening to Thai music ‘influenced by different countries’ and played on the Ranad-ek are discussed and like the previous section this discussion is divided into two components, the behavioural symptoms which are Predominately Hyperactive-Impulsive Type and Predominately Inattentive Type.

For the Predominately Hyperactive-Impulsive Type, the occurrence of ‘Excitable, Impulsive’ behaviour was reported in the results as decreased to 25.09%, although only two of the participants reduced the frequency of this unwanted behaviour. This was the only behaviour that showed the most reductive frequency in the Predominately Hyperactive-Impulsive group. The other behaviours in the group had a small change of incidence of only 12.73% in ‘Restless, Always Up and On the Go’ and 24.81% in ‘Destructive’ and ‘Disturbs Other Children’. The behaviour in the Predominately Hyperactive-Impulsive Type of ‘Restless in the Squirmy Sense’ showed no change between before and after the program.
The ‘Excitable, Impulsive’ behaviour is that which is always found in children with ADHD. The behaviours in this Hyperactive-Impulsive Type were always noted when participants who were listening were making noises inappropriately, interrupting the teacher when playing music, disturbing others or being impatient. Figure six displays the ‘Does Not Listen to Others’ behaviour which is one always found associated with impulsive behaviour. The graph shows the occurrence of this behaviour’s reduction as being the same as that of the ‘Talking When Not Necessary’ behaviour in Figure eight. Listening to Thai classical music played on the Ranad-ek, however, did decrease the ‘Excitable, Impulsive’ and ‘Disturbs Other Children’ behaviours in terms of increasing relaxation and mental calmness. This result fits with Dokmai’s findings that listening to Thai music can improve children’s attention, reduce stress and promote mental calmness (2003).

In this study other behaviours in the Predominately Hyperactive-Impulsive Type including ‘Restless in the Squirmy Sense’, ‘Restless, Always Up and On the Go’ and ‘Destructive’ only showed a reduction in the frequency by one participant. Also shown in the graph and in the descriptive reports by the researcher is that the incidence of the ‘Restless and Fidgety’ behaviour increased from session one but tended to decrease from session three onwards. Overall, however, the incidence of this behaviour increased and finally it was at the same level as it was at the start (Figure four). It seems that listening does not help participants to control their behaviours at all.

The ‘Restless, Always Up and On the Go’ behaviour and the ‘Moving Around the Room’ behaviour shown in Figure five, both decreased by the end of the program. A child diagnosed as ADHD will often dash around, walking or talking nonstop and it occurs more often and more severely than with children without ADHD (Journal of Practical Nursing, 2009). When participants were listening, they were free to do anything. No one and nothing forced them to stay still. This is very different from music improvising where there are instruments that act as a tool requiring participants to sit and play. Last, these are physical responses from musical interaction. Human bodies respond naturally with movement (Hodges, 2009). ‘Destructive’ behaviour was not shown much during the listening activity excepted
one of the participants hitting another one in session seven and eight (Appendix D, pp. 76-77).

Regarding behaviours in the Predominately Inattentive Type, it was surprising that the participants displayed a satisfactory reduction in undesirable behaviours. Two of the three participants demonstrated a reduction in the frequency of ‘Fails to Finish Things’ and ‘Distractibility or Attention Span a Problem’ behaviours. There was a 33.50% reduction in the occurrence of ‘Fails to Finish Things’, 22.33% in the occurrence of ‘Distractibility or Attention Span a Problem’ and a 33% reduction in the frequency of ‘Cries Easily or Often’ and ‘Easily Frustrated in Efforts’. The incidence of ‘Mood Changes Quickly and Drastically’, however, remained the same as before the study’s commencement.

In regards to the ‘Fails to Finish Things’ behaviour, research by Weibe & Nicol, (2007) included the presentation of a poem about the effect of music listening on children with ADHD. An extract of this poem is below:

It’s easier to get work done
It puts more fun into the day
School Rules: No MP3 Players
When I was funnier I could learn more! (p. 172)

An extract from another poem in Wiebe’s and Nicol’s research is below:

If you take music away, it’s like taking glasses away from another person, so that now they can’t read, that doesn’t help them
Now they can’t focus or now they can’t stay calm (Weibe & Nicol, 2007, p. 172)

Wiebe’s and Nicol’s research very clearly showed how music affects ADHD children. They found that music listening could help participants in terms of difficult emotions and inattentive behaviours such as ‘Distractibility or Attention Span a Problem’. However, this present study did not show much change in some inattentive behaviours. Nevertheless it is well understood that music listening
benefits children with ADHD and in this study this may have been observed had the study extended over a longer period of time or had more participants.

The Comparison Between Improvising and Listening

Referring to the above discussion about getting children with ADHD to listen to or improvise with Thai music it is evident that these approaches did not significantly change undesirable behaviours. The improvising group, however, provided a stronger frame within which to physically restrain participants. That is why musical improvisation reduced the frequency of behaviors in the Predominately Hyperactive-Impulsive Type more than behaviours in the Predominately Inattentive Type, while listening had a more frequent reduction in the Predominately Inattentive Type than in Predominately Hyperactive-Impulsive Type. It can be said, therefore, that Thai music did affect to hyperactive behaviours of children with ADHD. As reported by Rickson (2006), who studied the effect of instructional and improvisational music approaches with ADHD children on motor impulsivity, there was no statistical difference between the impact of the contrasting approaches.

Although Thai music may have contributed to a reduction of the incidence of the hyperactive behaviours of these particular participants with ADHD, the improvising group seemed to have better results than the listening group. This is why results about the effects of Thai music on different types of children from previous studies (Dokmai, 2003; Iamyung, 2006; Srisukon, 1996; Comwatjanung, 2001) noted an improvement in behaviours and emotion not only in relation to a specific way or approach, but in all types of music such as Thai music practice, Thai music listening, general Thai music in activities, and in this study, Thai music improvisation.

In summary, although children with ADHD often engage in unwanted behaviours that impact their lives, especially their school life, there have been many suggestions about how best to treat children with ADHD. Some believe that stimulant medication is that best way to treat those children (Jackson, 2003). However, other therapeutic applications, for instance art activities, activity therapy, concentration and imagination activities and music therapy are also interesting ways to treat children with ADHD.
Thai music activity is a good choice for Thai children with ADHD as they are familiar with the sound of Thai music and they respect Thai instruments as objects which are sacred items in Thai culture. This is especially so for the Ranad-ek, the instrument selected as a therapeutic tool in this way not only for its sound and timbre but also for its dimensions and the way it is played. The results of this study confirm that Thai music, both listening and improvising, benefits Thai children with ADHD in terms of reducing the frequency of hyperactive and inattentive behaviours. The style of ‘music influenced from different countries’, of which most pieces used in the present study were from, are all in a pentatonic scale and allowed participants to improvise easily. Thai music improvising decreased most incidences of behaviours in the Predominately Hyperactive-Impulsive group and Thai music listening decreased most incidences of behaviours in the Predominately Inattentive group. Thai music, therefore, has potential for being an interesting tool to treat children with ADHD in order to reduce unwanted behaviours and emotions. It may be used with medication for the most effective results.

Despite the findings in this study there were many limiting factors at play. First, the number of participants in each group, three, was a very small sample. This was because of the availability of instruments and of the study’s process. In each session, for the most effective activity and interaction, a limited number of participants was necessary. If more participants had been engaged then more sessions and resources would have been required and this would have been quite difficult in the limited time available. Second, there was no comparison between the Ranad-ek and other instruments. This research was a pilot study to investigate the efficacy of Thai music, and the Ranad-ek seemed the most appropriate instrument for the study. For future studies, other Thai instruments, or music from other cultures, could be applied in order to test their potential as therapeutic tools. Finally, in relation to the literature, there have been very few studies in the area of Thai music for children with special needs.

It is recommended that further research should investigate Thai music as a therapeutic tool. Such studies may compare the Ranad-ek with other Thai musical instruments as therapeutic tools, or examine different results using Thai
instruments and Western instruments. Other research could study other approaches, apart from improvising and listening, or investigate other applications such as meditation in collaboration with music therapy. Further the results of this pilot study may expand the benefits of Thai music including, for example, improving the cognitive part of ADHD, such as using music to achieve improvements in emotion, self-esteem or self-efficacy. Moreover, larger numbered sample sizes will be considered for future research designs.

**Summary and Conclusions**

ADHD, or Attention Deficit Hyperactivity Disorder, is one of the most common disorders found in childhood and it has the potential to continue through adulthood. The American Psychiatric Association (APA) has described Attention Deficit Hyperactivity Disorder as making people hyperactive, impulsive and inattentive (2010, p. 1). In Thailand, there is approximately a 5% prevalence of ADHD in children aged seven to twelve (Pornnoppadol, 2009) and it occurs more frequently in males than females (Trangkasombat, 2008). It is well known that the basic symptoms of ADHD affect the ability of children diagnosed in terms of living, having relationships and studying. There have been many approaches used to treat children with this disorder including medication, behaviour therapy or educational remediation (Sumamal, 2006). There has been research that has investigated the effect of music therapy on children with ADHD and the results have been positive (Jackson 2003; Montello & Coons 1999; Rickson, 2006; Rickson & Watkins, 2003). Until the present study, however, there has been no research on using Thai music as a form of therapy for ADHD children.

The Ranad-ek is one of the Thai classical instruments. It appeared around 1350s, or in the Ayutthaya Kingdom, and came to have an important role in the ensembles. Thai music ensembles were in Thai people’s everyday life from birth to death (Phukaothong, 1996). In Thai culture, Thai music instruments are sacred items and Thai people respect them like benefactors. There have been several studies on the use of Thai music for therapeutic purposes for children with conditions other than ADHD and it was found that it improved behaviours associated with attention,
learning achievement, mental calmness and relationship (Dokmai, 2003; Iamyung, 2006; Srisukon, 1996; Comwatjanung, 2001).

In the present study, the purpose was to investigate the effect of one musical style and one musical instrument on Thai children with ADHD. The study was designed to compare children actively improvising on the Ranad-ek with children listening to the Ranad-ek. The six participants were divided into two groups, three participants in the improvising group and the other three in the listening group.

The results from the Hyperactivity Index of Conners’ Parent Rating Scales showed that the incidence of some behaviours had no change in both groups. These behaviours were: ‘Restless in the Squirmy Sense’ and ‘Mood Changes Quickly and Drastically’. The behaviours that were more decreased in frequency in the improvisation group more than in the listening group were: ‘Restless, Always Up and On the Go’, ‘Destructive’, ‘Fails to Finish Things’ and ‘Disturbs Other Children’. The occurrence of behaviours that decreased more markedly in the listening group than in the improvising group were: ‘Distractibility or Attention Span a Problem’ and ‘Easily Frustrated in Efforts’. The rest of the behaviours, ‘Restless in the squirmly sense’ and ‘Mood changes quickly and drastically’, showed the same reduction in both the improvising and listening groups. Overall there was not much difference in the findings between the improvising group and the listening group. In addition, the results from the Behaviour Observation Form revealed that the improvement in behaviours of the participants was greater during improvising music than during listening to it.

The strength of this study is the small sample sizes. All participants were observed in detail. The researcher as the music teacher could control unexpected situations that might happen during sessions. The hyperactive behaviours of participants were recorded as video and documents. On the other hand, the small sample sizes are the limitation in this study as well. The results cannot be interpreted on behalf of ADHD children generally. However this current study has been presented as a pilot study and a guideline to design research in the future, in particular, number of
participants, length of treatment and the possibility of using traditional music as a therapeutic tool.

It can be said that, although the results cannot indicate which approaches were more effective, in this small study participants were able to reduce hyperactive symptoms when improvising on, or listening to, a Thai traditional instrument. Future studies may be able to extend on these findings and examine the effect of Thai music on different subjects as well as study different musical approaches using Thai music and musical instruments.
References


54


Pornnoppadol, C. (2009). Let’s help and know about ADHD. *Faculty of Medicine Siriraj Hospital.* Retrieved from http://www.si.mahidol.ac.th/sidoc/eur


Appendices

A  Conners’ Parent Rating Scales
B  Behaviour Observation Form
C  Pre and Post Ratings of the Frequency of Target Behaviours
D  Descriptive Reports by the Researcher
E  Participant Consent Form for Parents/Caregivers
F  Participant Information Sheet (Parent/Caregiver)
## Appendix A

### Conners’ Parent Rating Scales

Student’s name..............................................................Age..................Year................

Parent’s name........................................................................................................................................

Date............................................................................................................................................................

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Not at all true</th>
<th>Just a little true</th>
<th>Pretty much true</th>
<th>Very much true</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Picks at things (nails, fingers, hair, clothing)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Sassy to grown-ups</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Problems with making or keeping friends</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Excitable, impulsive</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Wants to run things</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Sucks or chews (thumb, clothing, blankets)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Cries easily or often</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Carries a chip on his shoulder</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Daydream</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>Difficulty in learning</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>11.</td>
<td>Restless in the ‘squirmy’ sense</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>Fearful (of new situation, new people or places, going to school)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13.</td>
<td>Restless, always up and on the go</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14.</td>
<td>Destructive</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15.</td>
<td>Tell lies or stories that aren’t true</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16.</td>
<td>Shy</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17.</td>
<td>Gets into more trouble than others his same age</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18.</td>
<td>Speaks differently from others same age (baby talk, stuttering, hard to understand)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19.</td>
<td>Denies mistakes or blames others</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20.</td>
<td>Quarrelsome</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21.</td>
<td>Pouts and sulks</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22.</td>
<td>Steals</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23.</td>
<td>Disobedient or obeys but resentfully</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>24.</td>
<td>Worries more than others (about being alone, illness or death)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25.</td>
<td>Fails to finish things</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26.</td>
<td>Feelings easily hurt</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27.</td>
<td>Bullies others</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28.</td>
<td>Unable to stop a repetitive activity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>29.</td>
<td>Cruel</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30.</td>
<td>Childish or immature (wants help he shouldn’t need, clings, needs constant reassurance)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>31.</td>
<td>Distractibility or attention span a problem</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>32.</td>
<td>Headaches</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>33.</td>
<td>Mood changes quickly and drastically</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>34.</td>
<td>Doesn’t like or doesn’t follow rules or restrictions</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>35.</td>
<td>Fights constantly</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>36.</td>
<td>Doesn’t get along well with brothers or sisters</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>37.</td>
<td>Easily frustrated in efforts</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| 38. | Disturbs other children ..........................................
| 39. | Basically an unhappy child ..........................................
| 40. | Problems with eating (poor appetite, up between bite) ..........
| 41. | Stomachaches .........................................................
| 42. | Problems with sleep (can’t fall asleep, up to early, up in the night) ..........................................
| 43. | Other aches and pains ................................................
| 44. | Vomiting or nausea ....................................................
| 45. | Feels cheated in family circle .......................................|
| 46. | Boasts and brags .......................................................|
| 47. | Lets self be pushed around ...........................................
| 48. | Bowels problems (frequently loose, irregular habits, constipation) ...........................................

## Appendix B

### Behaviour Observation Form

ADHD behaviours observed during session no. ............................................................

Name................................................................................................................................

Date................................................................................................................................

<table>
<thead>
<tr>
<th>Behaviour noted</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Restless and fidgety</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moving around the room</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Does not listen to others</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Making inappropriate noises</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Talking when not necessary</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

0  =  Never
1  =  Occasionally
2  =  Often
3  =  Very often
Appendix C

Pre and Post Ratings of the Frequency of Target Behaviours

Table A-1 shows pre and post ratings of the improvising group in regards to 10 target behaviours from Conners’ Parent Rating Scales: Hyperactivity Index

Table A-1: Pre and post ratings of the frequency of target behaviours of the improvising group

<table>
<thead>
<tr>
<th>Items</th>
<th>Participant 1</th>
<th>Participant 2</th>
<th>Participant 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre</td>
<td>Post</td>
<td>Pre</td>
</tr>
<tr>
<td>4. Excitable, impulsive</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>7. Cries easily or often</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>11. Restless in the ‘squirmy’ sense</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>13. Restless, always up and on the go</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>14. Destructive</td>
<td>2</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>25. Fails to finish things</td>
<td>2</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>31. Distractibility or attention span a problem</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>33. Mood changes quickly and drastically</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>37. Easily frustrated in efforts</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>38. Disturbs other children</td>
<td>3</td>
<td>1</td>
<td>3</td>
</tr>
</tbody>
</table>
Table A-2 shows pre and post ratings of the listening group in regards to 10 target behaviours from a modified version of the Conners’ Parent Rating Scales: Hyperactivity Index

**Table A-2:** Pre and post ratings of the frequency of target behaviours of the listening group

<table>
<thead>
<tr>
<th>Items</th>
<th>Participant 1</th>
<th></th>
<th>Participant 2</th>
<th></th>
<th>Participant 3</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre</td>
<td>Post</td>
<td>Pre</td>
<td>Post</td>
<td>Pre</td>
<td>Post</td>
</tr>
<tr>
<td>4.  Excitable, impulsive</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>7.  Cries easily or often</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>11. Restless in the ‘squirmy’ sense</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>13. Restless, always up and on the go</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>14. Destructive</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>25. Fails to finish things</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>31. Distractibility or attention span a problem</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>33. Mood changes quickly and drastically</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>37. Easily frustrated in efforts</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>38. Disturbs other children</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
Appendix D

Descriptive Reports by the Researcher

Introduction

A description of each session was recorded in order to more fully understand the atmosphere and the children’s behaviours and problems as the study progressed. The study was divided into two groups: improvising and listening and is described in detail below.

Improvising Group

Session 1

This was the first time that the three boys in the improvising group met the music teacher. All children were diagnosed as ADHD. They were coded as E, C and V for participant 1, 2 and 3 respectively and they were nine years old. Each child was from a different school. In the first session, all participants were invited to sit behind one of the three Ranad-eks which were placed in a circle. The teacher introduced herself and invited the participants do so as well. The participants seemed excited when they saw the Ranad-ek and started asking the teacher questions. It took approximately five minutes for this stage of relationship building. The teacher explained about the Ranad-ek, taught the participants how to hold the mallets and showed them the area to play on the instrument. The music used in this session was *Burma Kuei*, or the song of elephant. This piece is categorised as a happy type because of the lyrics. It describes the elephant and its parts. The behaviour of the participants can be described as follow;

E: He was invited to sit behind the Ranad-ek at the right side of the music teacher.

When the teacher explained about the instrument and piece, he always asked
about the instrument and talked about his school. Although he participated in
the activity very well, he tried to play the Ranad-ek before the teacher gave
permission. He could not wait or stay still without being restless and fidgety.
When he was playing the instrument, he could not control the mallets to beat on
the Ranad-ek. He beat too loudly and heavily and that made the plug of lead for
tuning the Ranad-ek drop down (this plug is inserted underneath the wooden
keys). After the lead dropped down, he was curious about the problem and tried
to fix it.

C: He sat behind the Ranad-ek at the left side of the teacher, opposite E. He was
very talkative. He talked with loud noise and interrupted when the others were
playing. At first, he was shy and afraid to play the instrument. After that he
created a way of playing that was different from the others such as using one
hand to play on the Ranad-ek. During the session, he observed others and asked
the teacher how to play the Ranad-ek.

V: He sat behind the Ranad-ek, opposite the teacher. He was very quiet and shy. If
the teacher did not invite him, he would not improvise. He used the mallets very
gently and beat on the wooden keys very lightly. He answered only when the
teacher asked and he did not interrupt others. He was a good listener. He always
looked at the teacher and did the same while playing the instrument. At the end
of the sessions, he asked the teacher to play more times.

Session 2

In this session Lao Kruan was used, a piece with a sad mood. All participants sat at
the same place as the previous session. At the beginning of the session the teacher
explained the piece to the participants in regards to its lyric meaning and history.
Then the teacher played the one time and invited the participants to play along.

E: When he came into the room, he immediately went to the Ranad-ek and played
by himself. He did not care when the teacher asked him to stop. He improvised
the piece with heavy beating and did not care about rhythm and dynamic
accuracy. He used new techniques to improvise with the song, for example
beating with one hand, using his right hand across the left and sliding the mallet over the wooden keys. Even when the session was finished he continued to play.

C: When the session started he started talking and often interrupted throughout the session’s duration, even when the teacher was speaking. He played the instrument inappropriately, for example beating in an area which shouldn’t be played on. When he was playing he smiled, spoke and laughed. He was interested when others played, especially E. Then he complained to them about their playing approach. When the teacher asked about the feeling of the music he did not answer but slid one of the mallets over the wooden keys and said that he felt like that.

V: He spoke more than the previous session. He was interested in the instrument and how to play it. He improvised by himself before the teacher started to play. He smiled and laughed with C when they were playing together. He told the teacher that playing the Ranad-ek was fun.

Session 3

The happy piece, Yosalum, was used in this session. The rhythms of this piece are influenced by marching. When starting the session the teacher played the piece one time for the participants. In this session, the dynamics of the piece were a feature. The teacher gave advice to participants and invited them to mimic the dynamics the teacher was displaying.

E: When the teacher explained about the song and the dynamic, E focused on his instrument and played by himself. He accepted the rules better than in previous sessions. When the teacher asked him to listen and stop playing, he did. He improvised without caring about the dynamics and rhythms but after he got used to the piece, he could turn down his sound to produce a lighter and slower effect.

C: In this session, his behaviours changed positively. He interrupted others less than previously. He paid attention to playing dynamically as the teacher did. However,
when the teacher played softly, he stopped improvising and waited until the teacher played louder. In the question part, he was enthusiastic to answer questions.

V: He was still playing a soft sound without dynamics. When he improvised he never used different playing techniques. He played the instrument with two hands as the teacher did. When the teacher asked a question, and other participants tried to answer, he did not speak but just smiled. He did answer, however, when the teacher asked him specifically.

Session 4

In this session, the teacher used the sad piece, *Tayoi Yuan*. The melody of this piece has long been used in Thai folk music and continues to be popular. At the beginning of the session the teacher gave a description of the song in order to observe the participants’ behaviors and attention. After that, the piece was played once.

E: He had an argument with C because C thought he made a very loud noise and he looked childish. E made inappropriate noises and used the mallets to hit the Ranad-ek. He interrupted others and spoke when others were speaking. During his improvising he could control the dynamic as the teacher played but he improvised without interest in rhythm.

C: He swore and used vulgar language many times. He observed E when E was playing and reprimanded him. He interrupted others and played less than before.

V: When E and C had an argument he was quiet. He could improvise with focused attention. He could control dynamics and rhythm very well.

Session 5

This session was about improvising the happy mood song, *Lao Long Nan*. The session started with the teacher telling participants the story of the piece. The teacher emphasised the dynamics of the piece and taught them how to place the
mallets on the instrument. The teacher played this piece one time to the participants before they started improvising.

E: Although he did not listen when the teacher was explaining the piece’s story, he could control himself enough to listen to the music that was played by the teacher without fidgeting. When the teacher and others stopped playing, he still played on his instrument. He still did not care about dynamics and rhythms. He again beat on the wooden keys too strongly which caused the lead to drop out.

C: He was much better when the teacher asked questions. He did not swear at E. He paid attention to the teacher and improvised at the beginning of the session. However, he used the mallets to beat on others’ instruments and ignored the teacher when the teacher tried to stop him. He still interrupted the group.

V: He was braver in speaking to others than previously. He tried to play exactly the same as the teacher without improvising as the other participants were doing.

Session 6

The piece selected to play in this session was Lao Duang Duen. It is categorised as having a sad mood because of its background. The teacher told the participants the story and played the piece once. After that the teacher invited them to play together.

E: When he came to the class, he started playing by himself. He was really interested in the story that the teacher told. He improvised the piece by using one hand crossing the other. He tried to beat on others’ instruments but when he realised that the teacher did not allow him to do that he stopped doing it.

C: He started playing before the class had started. He still interrupted others as previously. While others were improvising, he lay on the floor for a minute and then he improvised with the others again.
V: He played the Ranad-ek while the teacher was speaking. He talked to others more but did not answer much when the teacher asked questions. He tried to improvise throughout the whole song although this piece was very long.

Session 7

For this session the happy mood piece titled Lao Len Nam was selected. It was about people swimming with happiness. The teacher played the piece once at the beginning of the class and then let participants improvise. In this session participants were interested in the camera standing in the corner of the room and kept looking at it. The camera was moved out of the room.

E: He paid attention when the teacher told the story about the piece. He could control the weight he applied to the instrument when playing better than in previous sessions. He still had a conflict with C. Although he was upset, he could improvise the piece without caring about C. He could play the dynamics, following the teacher. However, in relation to rhythm, he improvised with his imagination without listening to the rhythms of the piece.

C: He argued with E about E’s music playing. He interrupted others less than previously. He could control himself to such an extent that he was able to improvise along with the dynamic and rhythms of the song.

V: He was smiling when improvising. He played the Ranad-ek louder and tried to use new ways to play, such as playing with one hand. He was still quieter than the others. He answered a question when the teacher asked and asked the teacher to play more.

Session 8

This was the last session of the improvising group. The sad mood piece, Yeepun Rum Peung, was chosen. All participants seemed enthusiastic to participate in the activity. The teacher explained about the piece’s story and played it once.
E: He kept saying he would like to play more after finishing the program. He paid attention when improvising. He followed and improvised better than in previous sessions. He could control himself to beat softly when he reached the soft dynamic part.

C: He still interrupted while others were playing. However, when he realised that this was the last class he acted very well and stopped interrupting others. He focused on the piece and improvised by listening to the dynamic and rhythms.

V: He was still quiet. He could proficiently control the weight of the mallets when playing. When he improvised, he did not care about the reaction of the other two boys even though they interrupted him. He focused on the piece and always smiled.

**Listening group**

*Session 1*

In the first session of the listening group the three participants met. The three ADHD boys were coded as W (eight years old), U (nine years old) and M (eight years old). In the first session the music teacher started by introducing herself and let the others introduce themselves. It took approximately five minutes for this stage. Following this the teacher explained how the Ranad-ek woked and played the boys several scales. The happy mood piece, *Burma Kuei*, was played. All participants were listeners.

W: He did not want to take part in the program at first unless his advisor sat with him. He could only sit for a minute and then he immediately stood up, moved his body and walked around the room. He said to his advisor that he did not want to sit and then hit the advisor with his book. After his advisor had gone the music teacher started playing the Ranad-ek and W said he wanted to draw. He always interrupted while the others were listening to the song. He put his paper on the Ranad-ek while the teacher was playing and used the instrument as a table for drawing.
U: He was very quiet and kept looking at W. He dragged his finger on the floor when listening to the Ranad-ek. He sat next to M without speaking or walking anywhere.

M: He paid attention when listening to the song. When the teacher asked him how many times the song had been played he answered correctly. He sat on the floor and slapped his hand on his lap along with the rhythms of the song.

Session 2

In this session, the sad mood piece, Lao Kruan, was played by the teacher. Some conditions were added such as counting the number of times the song was played and asking the boys about the song’s history. The teacher told participants about the song’s background and started to play.

W: He was interested in the cam recorder placed in the room corner. He walked to the camera and hid it by standing in front of it. W brought papers into the room although he was not allowed to do so. When the teacher was playing the instrument he sat down beside her and used a pencil to knock on the Ranad-ek. He made inappropriate loud noises and screamed, jumped around the room and danced.

U: When W went up to the camera, U also went with him. He stamped his feet and jumped in order to make noises. Sometimes he came and sat beside M. When the class was nearly over he came to the teacher and knocked on the instrument.

M: He paid attention listening carefully, as in the previous session. However, he used his hands to close his ears when W made a loud noise or screamed. He participated in the class very well and answered when the teacher asked questions.
Session 3

For the third session the teacher played the happy mood piece, *Yosalum*. This session had a similar routine to the sessions before. The teacher started by giving the boys the story of the piece and then played the Ranad-ek.

W: He was restless and walked around the cam recorder. He was very interested in the recorder and kept looking at it. He never sat on the floor. Sometimes he made noises like a dog and screamed but it was not as frequent and loud as in the previous sessions.

U: When the session started, he sat next to M. Sometimes he stood up and walked to the recorder. He asked the teacher about the instrument and the plugs of lead placed underneath the wooden keys. When he was listening, he sat on M’s lap and then lay down.

M: He focused on the music only. Even though the others were walking or made noises, he still listened to the music. After the teacher played, he asked about the source of the instrument’s sound.

Session 4

In the fourth session titled the sad mood piece *Tayoi Yuan* was played. There were new conditions for participants because besides M most had not focused on listening previously. For the first condition, the teacher invited them to move along to the song and when the teacher stopped playing the participants were to stop moving as well. For the second condition, the teacher invited them to lie down on the floor until the song was finished.

W: Before the teacher set the conditions, W walked to the instrument and knocked on it while the teacher was playing. Then he danced and jumped. After the conditions, he could control himself doing things that the teacher requested. After the second condition, in particular, he lay down on the floor for five minutes until the session finished.
U: When U saw W knocking on the wooden keys of the instrument he did it also. While the teacher was playing he crept around the room and then stood up to dance. However, he did undertake the conditions, and after the second condition lay down until the teacher finished playing the music.

M: He could control himself to focus only on the music. He was a good listener. He sat down and took part very well in the activities without any conditions.

Session 5

In session five, Lao Long Na, was selected which is a happy mood piece. At the beginning of the session the teacher told participants about the piece’s background. The music teacher invited them to play a game that involved counting how many times the teacher played the piece.

W: He always stood up. In this session he walked round the room less than in previous sessions. However he still kept looking at the camera. W always shouted and interrupted the others. When the teacher asked him about the piece he didn’t answer.

U: While the teacher was explaining the music’s story, he was very fidgety. However, when the teacher was playing the music he paid more attention and moved himself to the song. After that he stood up and came over to the camera. Then he sat down next to M and dragged his finger along the floor and also knocked on the floor. When the teacher asked the participants how many times the teacher had played the piece, he answered correctly. He crept along the floor and was always moving himself, sometimes lying down and rolling on the floor.

M: He sat down and paid attention, listening to the music. He tried to answer when the teacher asked questions even though he gave the wrong answers. He often sat leaning against the wall while listening to the music. When the session was almost finished he lay down on the floor as U did.
Session 6

In session six the sad mood song, Lao Duang Duen, was played. This piece was longer than session five’s piece. The teacher related a story about the background of the piece before playing it to the participants on the Ranad-ek.

W: As in previous sessions, he stood up and never sat down. He walked around the room and was very restless but he did not interrupt the others much.

U: When he came into the room he went straight to the camera. When the teacher talked about the song’s story he lay down on M and invited M to play with him. He was fidgety. When the teacher was playing music he flounced and moved to the song’s rhythm and knocked on the floor. After that he crept around the room and then lay down. Sometimes U went over to the teacher and knocked on the instrument, then he sat leaning against the Ranad-ek.

M: At the beginning of the session, he came over to the instrument and asked the teacher to play it. While the teacher was speaking about the history of the piece, he lay down on the floor. Then he immediately sat down when the teacher started playing music. Sometimes he moved closer to the Ranad-ek and touched it.

Session 7

For this session the piece Lao Len Nam was used as a happy piece. The music teacher began by explaining about the piece’s background, then the teacher played the piece for participants.

W: He always stood up and was fidgety all the time. He tried to stand closer to the Ranad-ek. When the teacher asked him to sit near the other participants he said he did not want to sit. In this session he brought a snack and ate it. He interrupted the teacher when the teacher was playing the Ranad-ek. In the middle of the session he walked around the room and ran into U. He made noises interrupting the class. When the teacher asked him questions he chose to talk about himself and did not relate to the question that had been asked.
U: When W stood up U followed him. However after he was attacked by W, U went to sit beside M and hid from W. When he saw W coming closer he walked away.

M: He did not care about the others even when they came over to him. He continued sitting down and counting the number of times the song was played. He paid attention and listened to the music.

*Session 8*

For the last session the sad mood piece, *Yeepun Rum Peung*, was selected. The teacher started by explaining the history of the piece and then played the music.

W: He walked and ran around the room. When the teacher told participants about the piece’s background, he jumped. While the teacher was playing music he lay down on the floor and kicked U with his leg. After that he came up to the teacher, hit the instrument, then sat on the Ranad-ek. He continued walking around the room until the class finished.

U: When he came into the room he sat down. After that he lay down with W but when W kicked him he straightaway got up and sat away from him. At other times U danced, jumped and sometimes walked around the room.

M: He sat down and waited until the other participants were ready for the last class. He lay down on the floor when the teacher was playing music.
Appendix E

Participant Consent Form for Parents/Caregivers
Participant Consent Form for Parents/Caregivers

Project Title: The effect of receptive versus expressive music experiences on hyperactive behaviours of Thai children with Attention Deficit Hyperactivity Disorder (ADHD)

I, [print name]..........................................., give consent for my child [print name]........................................to participate in the research project titled 'The effect of receptive versus expressive music experiences on hyperactive behaviours of Thai children with Attention Deficit Hyperactivity Disorder (ADHD)'

I acknowledge that:

I have read the participant information sheet and have been given the opportunity to discuss the information and my child's involvement in the project with the researcher.

The procedures required for the project and the time involved have been explained to me, and any questions I have about the project have been answered to my satisfaction.

I have discussed participation in the project with my child and my child agrees to their participation in the project.

I understand that my child's involvement is confidential and that the information gained during the study may be published but no information about my child will be used in any way that reveals my child's identity.

I understand that my child's participation in this project is voluntary. I can withdraw my child from the study at any time, without affecting their academic standing or relationship with the school and they are free to withdraw their participation at any time.

I consent to improvising on the Ranad-ek or listening to the Ranad-ek. Please cross out any activity that you do not wish your child to participate in.

Signed (Parent/caregiver): Signed (child):

Name: Name:

Date: Date:
Appendix F

Participant Information Sheet (Parent/Caregiver)
Participant Information Sheet (Parent/Caregiver)

Project Title: The effect of receptive versus expressive music experiences on hyperactive behaviours of Thai children with Attention Deficit Hyperactivity Disorder (ADHD)

Who is carrying out the study?
Your child is invited to participate in a study conducted by Sasichom Krudhnark, student researcher of University of Western Sydney, Music.

The research will form the basis for the degree of Master of Arts (honours) at the University of Western Sydney under the supervision of Dr Diana Blom (Associate Professor), Head of Program, Music and Dr Alan Lem, clinical music therapist.

What is the study about?
The purpose is to investigate the effect of receptive (listening) and creative (improvising) Ranad-ek music on students diagnosed with ADHD.

What does the study involve?
The study will involve six male students, aged 8-10 years, diagnosed with ADHD. The children will be divided into the two groups, three for the improvising group and the other three students for the listening group. The improvising and listening groups will be chosen based on random selection.

Depending on the group your child will be selected for, he may be asked to play or listen to music. If your child is asked to play, he will be asked to come to the club at 10.00 a.m. on Saturday and Sunday, and will be seated in front of a teacher who will play a Ranad-ek. Another Ranad-ek will be positioned in front of the child. The child will be given two mallets. The teacher will start playing a Thai piece that has been influenced by different countries’ style and the child will be invited to improvise along. The improvisation will last approximately 20 minutes. After the improvisation the teacher will ask him about his feelings.

If your child is asked to listen to the music, he will be asked to come to the club at 1.00 p.m. on Saturday and Sunday. He will be invited to sit down in front of the teacher and the teacher will play the same pieces as the improvising group on the Ranad-ek. The child will not have to do anything specific. After the improvisation the teacher will ask him about his feelings.
How much time will the study take?
Recordings will be videoed.

Data will be collected between 26 March and 17 April 2011 during two sessions per week which will focus on improvising on the Ranad-ek or listening to the Ranad-ek. Video and recordings will be made of each session. The researcher will make notes observing behaviours during the sessions. All data will be stored with the University of Western Sydney for five years, after which it will be destroyed. Data will be accessed by the researcher, the two supervisors and the teachers from the Club.

If you have concerns about what has been recorded, you may access recordings of your child within the period of storage.

This project will not take part in school time. Children not participating in the study will undertake school music lessons but will not have permission to participate during the time the research is being carried out.

Will the study benefit me?
It is hoped that the study will benefit participants in terms of concentration, behaviours and focus.

Will the study have any discomforts?
No. The students should find the sessions enjoyable during the music activities.

How is this study being paid for?
The study is being supported by the University of Western Sydney.

Will anyone else know the results? How will the results be disseminated?
All aspects of the study, including results, will be confidential and only the researchers, supervisors, club’s teachers and participants’ guardians will have access to information on participants.

Can I withdraw my child from the study?
Your child’s participation in the study is entirely voluntary: you are not obliged to consent. Your child may withdraw from the study at any time - or you may withdraw your child from the study at which point all written and audio records of your child’s participation will be destroyed.

Can I tell other people about the study?
Yes, you can tell other people about the study by providing them with the chief investigator’s contact details. They can contact the chief investigator to discuss their participation in the research project and obtain an information sheet.

What if I require further information?
When you have read this information, Ms Sasichom will discuss it with you further and answer any questions you may have or you can contact her directly on Mobile (+66) 89 xxxxxx.
What if I have a complaint?
This study has been approved by the University of Western Sydney Human Research Ethics Committee. The Approval number is H8867.

If you have any complaints or reservations about the ethical conduct of this research, you may contact the Ethics Committee through the Office of Research Services on Tel 02-4736 0883, Fax 02-4736 0013 or email humanethics@uws.edu.au. Any issues you raise will be treated in confidence and investigated fully, and you will be informed of the outcome.

If you agree to participate in this study, you may be asked to sign the Participant Consent Form.