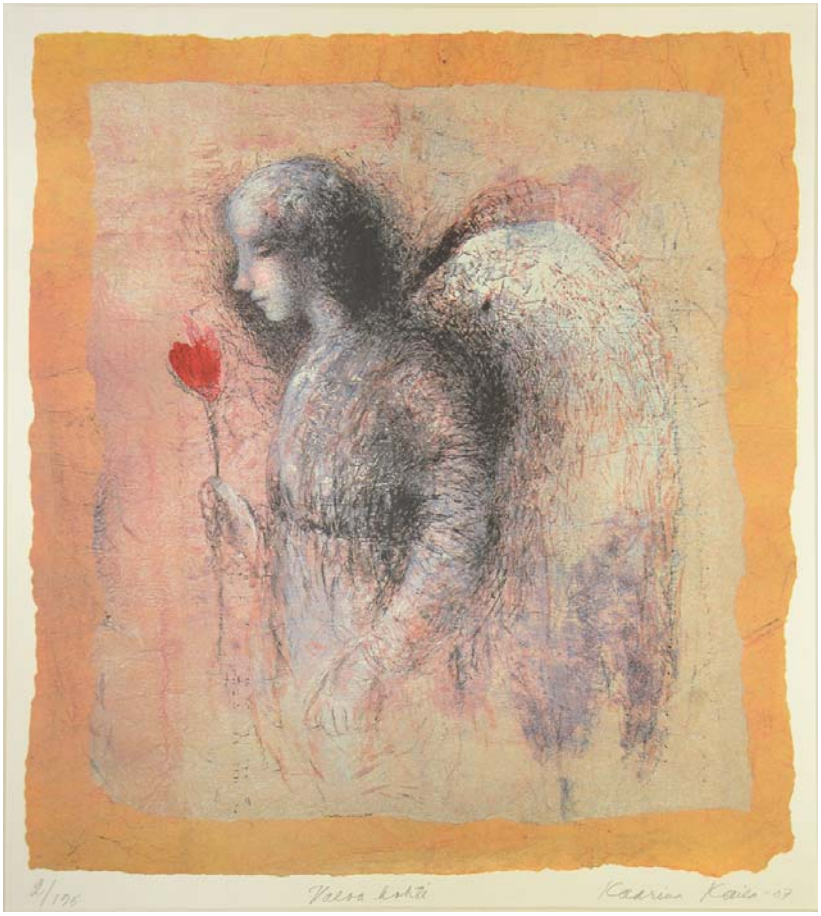
JYVÄSKYLÄ STUDIES IN HUMANITIES
153

Marko Punkanen

Improvisational Music Therapy and Perception of Emotions in Music by People with Depression



JYVÄSKYLÄN YLIOPISTO

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Esitetään Jyväskylän yliopiston humanistisen tiedekunnan suostumuksella
julkisesti tarkastettavaksi yliopiston Villa Rana-rakennuksen Paulaharju-salissa
toukokuun 6. päivänä 2011 kello 12.

Academic dissertation to be publicly discussed, by permission of
the Faculty of Humanities of the University of Jyväskylä,
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UNIVERSITY OF JYVÄSKYLÄ

JYVÄSKYLÄ 2011

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Cover picture "Valoa kohti" (Towards by Light) by Kaarina Kaila

URN:ISBN:978-951-39-4304-2
ISBN 978-951-39-4304-2 (PDF)

ISBN 978-951-39-4295-3 (nid.)
ISSN 1459-4331

Jyväskylä University Printing House, Jyväskylä 2011

ABSTRACT

Punkanen, Marko
Improvisational music therapy and perception of emotions in music by people with depression
Jyväskylä: University of Jyväskylä, 2011, 60 p. (94 p.)
(Jyväskylä Studies in Humanities
ISSN 1459-4331; 153)
ISBN 978-951-39-4295-3 (nid.), 978-951-39-4304-2 (PDF)

Depression is a highly prevalent mood disorder and a disabling disease that causes problems such as a reduction in quality of life and loss of general functioning. The present work investigated the perception and preferences of emotions in music by depressed patients and the efficacy of improvisational, individual music therapy for depression. The aim was to increase understanding of how depression affects emotional processing and emotion-regulation and how music and music therapy can be used in the treatment of depression. In main RCT-study participants (n=79) with an ICD-10 diagnosis of depression were randomized to receive individual music therapy plus standard care or standard care only, and followed up at baseline, at 3 months and at 6 months. Clinical measures included depression, anxiety, general functioning, quality of life and alexithymia. To investigate how depressed patients differ in their perception of emotions conveyed by musical examples, both depressed (n=79) and non-depressed (n=30) participants were presented with a set of 30 musical excerpts, representing one of five basic target emotions, and asked to rate each excerpt using five Likert scales that represented the amount of each one of those same emotions perceived in the example. To investigate how depressed patients differ in their preferences for music excerpts, both depressed and non-depressed participants were presented with 2 sets of 30 musical excerpts that represented the basic emotions (anger, sadness, and happiness), as well as different points on the 2-dimensional model of emotions (valence and energetic arousal). The main RCT-study showed that participants receiving music therapy and standard care showed greater improvement than those receiving standard care only in depression symptoms, anxiety symptoms and general functioning at 3 months follow-up. In sub-study 1 depressed patients showed moderate but consistent negative self-report biases both in the overall use of the scales and their particular application to certain target emotions, when compared to non-depressed controls. In sub-study 2 depressed patients were found to dislike music that was highly energetic, arousing, or angry.

Keywords: music therapy, depression, music, emotion perception, liking and preference, alexithymia, anxiety

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PREFACE

"Damn the rules, it's the feeling that counts", is a quote from great musician and saxophone player John Coltrane. It has been my motto for almost twenty years now, ever since I experienced and "understood" music's essence in Santana's concert in 1992. At that moment I felt that I was one with the music and musicians. I think that this is one of the most powerful aspects of music; to make us feel ourselves connected with other people and able to feel and express ourselves freely and truly.

This dissertation is one manifestation of my long and intense relationship with music and its curative and inspiring power. I have been privileged to witness so many times as a music therapist the changing forces of music in emotional challenges and difficulties. When you don't have the words music can speak for you. It will help you to express yourself, to release emotions that burden your mind, soul and body. It will move your body and soul to a better place. This work was conducted in the Finnish Centre of Excellence in Interdisciplinary Music Research in the Department of Music at University of Jyväskylä during the period between 2007-2011. I am grateful to a number of great and inspiring people who contributed to my work.

First of all, I want to thank my supervisor, Professor Jaakko Erkkilä, who has guided and supported my work during all these years. He has been my mentor and true friend for years and from him I have learnt a lot. I also want to thank my supervisor, Professor Tuomas Eerola for his inspiring, supportive and gentle attitude and sharing his knowledge and wisdom while preparing these articles.

I am very grateful to our team leaders Docent Mari Tervaniemi and Professor Petri Toiviainen for their encouragement and advice and all the CoE team members for their collegial help and support. Especially I want to thank Dr. Jörg Fachner, Dr. Esa Ala-Ruona and Dr. Christian Gold for great and inspiring co-operation, Inga Pöntiö for her assistance in data collection, Alex Reed for proofreading and my true Irish brothers Michael Dillon and P.J. Cleere for their long lasting help, advice and friendship.

The European Commission and the Academy of Finland made this work possible financially. Research participants who taught me so much about depression and let me witness their inspiring journeys away from depression towards the light made this study possible.

Most importantly, I want to thank my wife Elise, and my daughters Pihla and Kaisla for making my life beautiful and providing me with the most significant resources for conducting this work. This work is dedicated to them and loving memory of my late father Heimo Punkanen who gave me the music.

Lahti, February, 17th 2011
Marko Punkanen

FIGURES

ABBREVIATIONS

ACC	Anterior cingulated cortex
BDI	Beck Depression Inventory
BFI	Big Five Inventory
CBT	Cognitive Behavioural Therapy
CoE	Centre of Excellence
EEG	Electroencephalography
GAF	Global assessment of general functioning
GDS	Geriatric Depression Scale
HADS-A	The anxiety part of the Hospital Anxiety and Depression Scale
HRSD	Hamilton Rating Scale for Depression
ICD-10	International Classification of Diseases, Tenth Revision
MADRS	Montgomery and Åsberg Depression Rating Scale
MDD	Major depressive disorder
NEST	New and Emerging Science and Technology
POMS	Profile of Mood States
PTSD	Posttraumatic stress disorder
RAND-36	Health-related quality of life survey instrument
RCT	Randomized Controlled Trial
TAS-20	Toronto Alexithymia Scale

LIST OF ORIGINAL PUBLICATIONS

List of earlier publications, which are related to the first part of my PhD process (Licentiate thesis), not reprinted here:

I Punkanen, M. (2006). Musiikkiterapia osana huumekuntoutusta: Hoitoon kiinnittämisestä kokemusmaailman integroimiseen. Lisensiaatin työ (Monograph). Jyväskylän yliopisto.

II Punkanen, M. (2006). On a Journey to Somatic Memory. Theoretical and Clinical Approaches for the Treatment of Traumatic Memories in Music Therapy-Based Drug Rehabilitation. In D. Aldridge, J. Fachner (eds.) Music and Altered States: Consciousness, Transcendence, Therapy and Addictions. London: Jessica kingsley Publishers.

III Punkanen, M. (2010). Music Therapy as a Part of Drug Rehabilitation. From Adhering to Treatment to Integrating the levels of Experience. In D. Aldridge, J. Fachner (eds.) Music Therapy and Addictions. London: Jessica Kingsley Publishers.

IV Punkanen, M. & Ala-Ruona, E. (in press). Making My Body a Safe Place to Stay: A Psychotherapeutically Oriented Approach to Vibroacoustic Therapy in Drug Rehabilitation. In T. Meadows (ed.) Developments in Music Therapy Practice: Case Study Perspectives. Barcelona Publishers.

List of publications (reprinted after the introductory part), which are included in this thesis:

I Erkkilä, J., Punkanen, M., Fachner, J., Ala-Ruona, E., Pöntiö, I., Tervaniemi, M., Vanhala, M., Gold, C. (in press). Individual Music therapy for depression: Randomised controlled trial. British Journal of Psychiatry.

II Punkanen, M., Eerola, T., Erkkilä, J. (in press). Biased emotional recognition in depression: Perception of emotions in music by depressed patients. Journal of Affective Disorders.

III Punkanen, M., Eerola, T., Erkkilä, J. (in press). Biased emotional preferences in depression: Decreased liking of angry and energetic music by depressed patients. Music and Medicine.

SUMMARY OF PUBLICATIONS

I The first publication investigated the efficacy of music therapy when added to standard care compared with standard care only in the treatment of depression among working-age people. Participants receiving music therapy and standard care showed greater improvement than those receiving standard care only in depression symptoms, anxiety symptoms and general functioning at 3 months follow-up. The response rate was also significantly higher in music therapy with standard care than in standard care only.

The author was partly responsible for the study design, data collection, analysis and interpretation of data and the writing of the manuscript. Also, the author worked as one of the music therapists in the RCT framework.

II The second publication studied how depressed patients differ in their perception of emotions conveyed by musical examples compared to non-depressed controls. Depressed patients showed moderate but consistent negative self-report biases both in the overall use of the scales and their particular application to certain target emotions, when compared to the control group. Also, the severity of the clinical state had an effect on the self-report biases for both positive and negative emotion ratings. The practical implications of the study relate both to diagnostic uses of such perceptual evaluations, as well as a better understanding of the emotional regulation strategies of the patients.

The author was responsible for the major part of the work, including the experimental design, data collection and writing, and partly responsible for the analysis.

III The third publication investigated how depressed patients differ in their preferences for music excerpts compared to non-depressed controls. Depressed patients were found to dislike music that was highly energetic, arousing or angry, which is assumed to be related to their problems with emotion regulation. The present study has practical implications for the use of music and music therapy in the treatment of depression.

The author was responsible for the major part of the work, including the experimental design, data collection and writing, and partly responsible for the analysis.

CONTENTS

1 FROM THERE TO HERE: MY PHD PATH

I am a music therapy clinician and my research interests have always been strongly related to my clinical work. My trainings in dance-movement therapy and trauma psychotherapy have strongly influenced my music therapy work. Mind-body connection is one foundational element in my theoretical thinking. This principle comes from different sources of my studies. In somatic psychology it is the practical view that the body reflects the mind, and the mind reflects the body. That means that the state of mind influences the body and the state of the body influences the mind. This is very well defined in the work of Pierre Janet (e.g., Janet, 1907; van der Hart et al., 2006). Janet was the father of modern trauma theory and noticed this interaction of mind-body in his work in the field of psychiatry, psychological trauma and dissociation. Psychological trauma can manifest itself through psychological and somatic symptoms and the treatment of trauma needs to address both body and mind. It is quite common that clients don't come to therapy because of trauma but because of different symptoms and behaviors caused by trauma. These can be for example depression, anxiety, and substance abuse. I have worked with people suffering from drug addiction and depression and a common factor in many cases has been some unresolved trauma in their history or acute traumatic crisis in their lives. It is striking that among those seeking treatment for substance-use disorders, 42-95 percent report histories of trauma (Berry & Sellman, 2001; Brown et al., 2003; Dansky et al., 1999). Depression has been explained in psychoanalytic tradition through the traumatic events in a person's biography, often associated with dramatic losses and lack or deficit of love (Freud, 1917; Rado, 1951), and also in recent studies posttraumatic stress disorder (PTSD) has been strongly associated with major depressive disorder (MDD) (e.g., Gill et al., 2008).

I started my licentiate thesis quite soon after finishing my masters thesis on music therapy and drug rehabilitation in 2002. One result of my masters thesis was that participants were able to get in touch with their body sensations and their denied emotions through the combination of vibroacoustic therapy, music listening and therapeutic discussion. This led them to new insights about their addiction problem and the importance of emotion regulation skills. In my

licentiate thesis I wanted to continue to study the possibilities of music therapy in drug rehabilitation and deepen my understanding about this theme. I interviewed four music therapists who had long experience in the field of drug rehabilitation. The result of the study was that music therapy practice offers a lot of possibilities in drug rehabilitation, both in acute and follow-up phases of treatment. In the acute phase of treatment, music therapy can significantly strengthen and support the client's adherence to treatment. In the follow-up phase of treatment, music therapy's central role is in sorting out the reasons for addictive behavior and in integrating a client's levels of experience. With music therapy it is possible to treat the client comprehensively so that different levels of experience (sensorimotor, emotional, and cognitive) are worked on. Music therapy offers the chance for both individual and group sessions, and the range of methods available in music therapy that can be used in drug rehabilitation is wide and versatile. Because music is prominent in the world of drug users, it is absolutely necessary to take music into consideration in drug rehabilitation and also to process this aspect of the addiction problem. My licentiate thesis was a monograph and from that material I have prepared three book chapters, which are mentioned in the list of publications. I made a decision together with my supervisors not to include those publications in this research because that part of my PhD process has already been evaluated as a separate degree, and because it is based on a thematically different area and clinical context from that of part II (the time after becoming a member of the Finnish Centre of Excellence in Interdisciplinary Music Research). Publications related to my licentiate thesis contribute to the overall workload involved in the PhD thesis (The Licentiate thesis is approximately 50% of the PhD thesis).

I finished my licentiate thesis in 2006 and my aim was to continue with the same topic to finish my dissertation. In 2007 I was given the possibility of joining the research group, led by professor Jaakko Erkkilä, as a doctoral student. This research group was planning to do randomized controlled trial (RCT) about the effectiveness of improvisational music therapy in depression. This project was funded first by the NEST (New and Emerging Science and Technology) programme of the European Commission and continued by the programme for Centres of Excellence (CoEs) in research, funded by the Academy of Finland. My path from my masters thesis to joining the Finnish Centre of Excellence in Interdisciplinary Music Research is visualized in Figure 1.

FIGURE 1 My PhD path

The Finnish Centre of Excellence in Interdisciplinary Music Research consists of two teams, which are the Music Cognition Team in the University of Jyväskylä, led by professor Petri Toiviainen and the Brain and Music Team in the University of Helsinki led by docent Mari Tervaniemi. There are about 30 researchers in these two teams. The disciplines of these two teams are presented in Figure 2. The research questions are as follows:

- How is music perceived and processed?
- How are musical emotions evoked and represented?
- How do musical skills develop?
- How does musical training affect our brain?
- What is the role of corporeality in musical activities?
- How does music therapy affect?
- How can technology be used in music therapy?
- Does music enhance language learning?
- How does musicians' performance anxiety manifest and how it could be alleviated?
- How is music used for mood regulation?

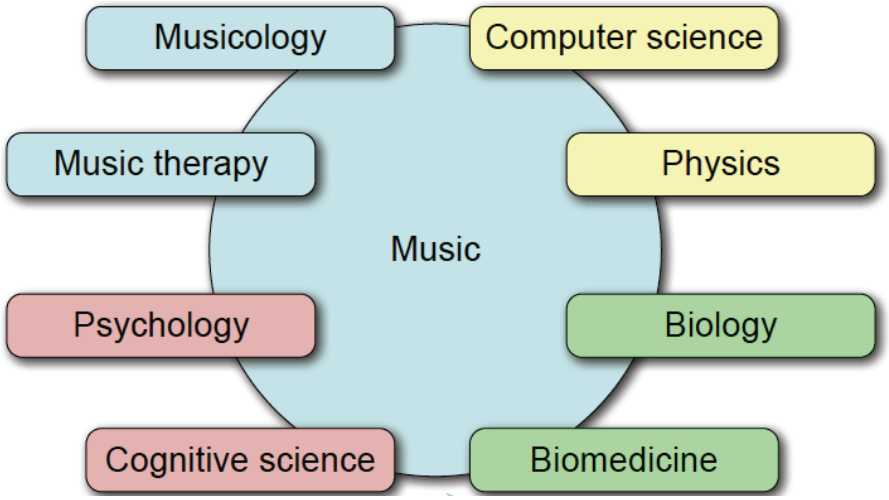

FIGURE 2 Disciplines of the Finnish Centre of Excellence in Interdisciplinary Music Research.

In this research I have looked for answers to the following questions "How is music perceived and processed?", "How does music therapy affect?", and "How is music used for mood regulation?"

I started my work in the music therapy and depression project in August 2007. At that phase we started to plan the design of the RCT-study and to build co-operation with local health care professionals who worked with patients with depression. My work at that point included many different things; making contacts with the depression nurses, taking part in the study design, the intervention design, helping professor Erkkilä and Dr. Ala-Ruona to train the therapists for this study, and taking part in the selection process of the measurement tools. All the measurement tools and data collection related to the whole music therapy and depression project is presented in Figure 3. This was a very busy and intensive period when a number of important decisions needed to be made. It was also a great learning time for me because all those things were totally new for me at that time.

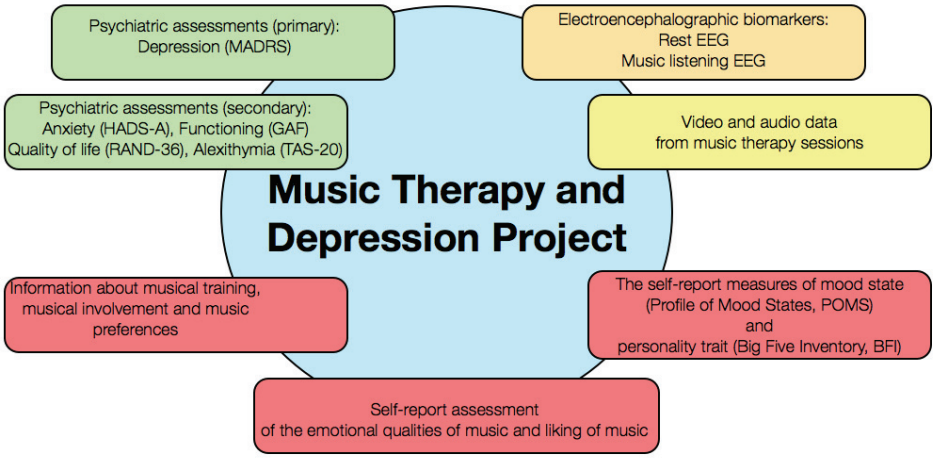

FIGURE 3 Data collection of the music therapy and depression project.

After the planning and preparation phase of RCT-study recruitment of the participants began in February 2008 and continued until April 2009. Participants were recruited primarily from the Central Finland Health Care District's psychiatric health-centres and the psychiatric polyclinics of Jyväskylä city. I would meet all the depressed participants three times during this study: before randomization, after the music therapy intervention and in a 6 months follow-up. My duty before randomization was to inform participants about the study, get their signed consent to participate in the study and collect information about their personality, musical background, musical preferences and current mood state. Additionally I conducted a behavioral experiment in all three phases of the study, in which participants assessed the emotional qualities of short music excerpts and rated their liking preferences for those music excerpts. Additionally to 79 depressed patients, I also met 30 non-depressed controls, collected the same information, conducted the same music assessment task and used their data as a control for the depression group for sub-studies 1 and 2 (see Figure 6 in chapter 2.7). I was also one of the therapists for the depressed patients. That was a very important role for me because I wanted to have a good rapport and affinity for the actual music therapy work we were investigating. In my role as a therapist, trainer and as participant in training for therapists, I could use knowledge and experience from my licentiate thesis and trainings in dance-movement and trauma psychotherapy. Music therapy in drug rehabilitation is

very closely linked to emotional processing, which helps clients to recognize, name, tolerate and regulate their emotions. This emotional processing was also the common ground in therapy work with depressed patients.

At the beginning of the study we decided to have 15 non-depressed participants in a control group for perception and preferences ratings of emotions in music. Finally I decided to increase the size of that group to 30 participants to make the groups little bit more balanced and increase the effect size of data analysis.

It was decided to include self-report measures to assess the emotional qualities of music in data collection because we knew that there was earlier research about the emotion recognition problems in depression and the negative bias demonstrated by depressed patients. We were interested to investigate whether this negative bias, which has been demonstrated in other domains like faces would also be apparent in music. A positive factor was that we were able to use music excerpts, which were already validated with a larger, non-clinical population (n=116). This led me to close co-operation with professor Tuomas Eerola who became my second supervisor for my doctoral research. Professor Eerola has used these music excerpts in his previous studies and we were able to build our experiment based on his experience and knowledge.

I think that including this experiment related to perception and preferences of emotions in music gave us very important information about depression. This new information and knowledge about the effects of depression on emotion recognition and liking preferences can help us in our music therapy work with depressed patients, for example in decisions on music that is used and in understanding the emotional problems related to depression.

2 INTRODUCTION

This study focuses on depression, emotions in music and emotions expressed through music in music therapy. This research was conducted at the Finnish Centre of Excellence in Interdisciplinary Music Research within the University of Jyväskylä. Study design started 2007 and recruitment of participants began in February 2008 and continued until April 2009. This research has two main emphases. Firstly it investigated the effectiveness of improvisational, individual music therapy plus standard care compared to standard care only. Secondly this research explored the effect of depression on perception and preference of emotional qualities of music by comparing the ratings of depressed patients and non-depressed controls.

This chapter is an introduction to the thesis. I will outline the main concepts and framework of this research. The third chapter presents the aims of the main RCT-study and two sub-studies of music perception. The fourth chapter summarizes the results of the studies. In the final chapter the results of this research will be discussed and interpreted in a framework of music therapy, music and emotions. The implications of the results to the clinical music therapy work will also be discussed as well as ideas for future research.

2.1 Depression

Depression is one of the leading causes of disability, affecting approximately 121 million people worldwide (WHO, 2010). The estimated prevalence of depression in Finland is at 5-6.5% of the population, and lifetime prevalence is 20% of the population (Tuulari et al., 2007), which is similar to lifetime prevalence estimates in Netherlands, Australia (Kruijshaar et al., 2005) and U.S. (Kessler et al., 1994). Because of the high prevalence of this disorder and its effects on a person's ability to work, depression has huge economic effects on our society. For example in Finland 4,600 new people got a disability pension in 2007 because of depression (Käypä hoito-suositus, 2010).

Depression is a mood disorder characterized by sad mood, anhedonia and changes in psychomotor, sleeping and eating patterns (American Psychiatric Association, 2000). Depression is most commonly a disorder that affects a person's ability to represent and regulate mood and emotion (Davidson et al., 2002). There are different kinds of symptoms related to depression. It can manifest itself through hopelessness, loss of mood reactivity, inability to experience pleasure, suicidal thoughts and psychosis (Kalia, 2005). These are symptoms that cause a lot of suffering for both the patients with depression and their families. Impaired emotion regulation is the essence of depression. Theorists have suggested that the difference between depression vulnerable and non-vulnerable people is not in their initial response to a negative event, but in their ability to recover from it (Teasdale, 1988). This leads us to different emotion-regulation strategies. Previous studies have shown that the level of depression symptoms correlates with more frequent use of strategies like expressive suppression, thought suppression, rumination and catastrophising and less frequent use of strategies like reappraisal and self-disclosure (Campbell-Sills et al., 2006; Garnefski & Kraaij, 2007; Gross & John, 2003).

Modern neuroimaging techniques have revealed new information about the changes in brain activation related to depression. Malfunctions characteristic of depression include an increased activity in the anterior cingulated cortex (ACC) and limbic brain regions, and decreased connectivity between ACC and limbic regions during negative emotional stimuli (Anand et al., 2005); unbalanced physiological activity (asymmetry) in the frontal lobes of both left and right hemispheres (Rotenberg, 2008); or an imbalance in several brain neurotransmitter systems, such as serotonin, norepinephrine, and dopamine (Kalia, 2005). EEG-studies have established that, relative to healthy controls, depressed participants demonstrate hypoactivation in the left frontal, and hyperactivation in the right frontal lobes (e.g., Allen et al., 1993; Henriques & Davidson, 1991; Field et al., 1995). This frontal brain asymmetry may well be a biological marker of risk for depression. The approach-withdrawal hypothesis has been the primary framework that has been offered to account for the linkages between frontal brain asymmetry and depression (Tomarken & Keener, 1998). Depression has been linked to avoidance behavior (Henriques & Davidson, 1991; Allen et al., 1993; Gotlib et al., 1998) and underactivation of the approach system (Carver, 2001). It has been proposed that avoidance behavior (Barlow et al., 2004; Leventhal, 2008) or inadequate progressing of approach and avoidance processes lead to depression and anxiety disorders (Carver, 1998).

Major depressive disorder and anxiety are often comorbid with each other. These disorders are also commonly associated with other psychiatric disorders. When depression and anxiety are comorbid it can increase treatment resistance and risk for suicide. It can also cause greater chance for recurrence. (Aina & Susman, 2006.) Alexithymia is also related to depression. Alexithymia was originally defined as a person's inability to recognize and verbalize emotions (Sifneos, 1973). Recently Bagby et al. (2006) have shown that alexithymia is a combination of reduced affective awareness and increased operative thinking,

which results in socially avoidant behavior (Spitzer et al., 2005). According to Hintikka et al. (2001) alexithymia may be highly associated with depression (Hintikka et al., 2001). This is also suggested by other studies (Hendryx et al., 1991; Honkalampi et al., 2000). For example in the Honkalampi et al. (2000) study the prevalence of alexithymia was 32.1% among those having BDI (Beck Depression Inventory) scores of 9 or more, but only 4.3% among the non-depressed subjects (Honkalampi et al., 2000).

2.2 Depression and emotions

Depression is an affective state, which is dominated by a sad mood. Depression affects both recognition and expression of emotions. Previous studies have shown that depression affects a person's ability to recognize facial emotions (George et al., 1998). This is the case with emotionally neutral faces (Leppänen et al., 2004), sad and happy faces (Gur et al., 1992) as well as more subtle changes in other's facial expressions (Surguladze et al., 2004). These recognition problems are characterized by a systematic, negative attentional bias. In Gotlib's et al. (2004) study depressed patients paid more attention to sad facial expressions, than to neutral facial expressions when presented to them at the same time (Gotlib et al., 2004). In Suslow et al. (2004) study depressed patients specifically shifted their attention away from happy facial expressions (Suslow et al., 2004) and in another study showed a reduction in perceptual sensitivity to happy facial expressions (Surguladze et al., 2004; Hayward et al., 2005). Depressed patients have shown prolonged involuntary processing for negative information when compared with healthy controls. This was demonstrated by sustained bilateral amygdala activation for negative rather than positive words. (Siegle et al., 2002.) In one study patients with depression recalled a higher proportion of negative words than positive ones of those previously presented, when compared to non-depressed controls (Joormann, 2004). Kan et al. (2004) found that depressed patients interpret neutral prosodic emotive stimuli in a more negative way than healthy controls (Kan et al., 2004). There are also some early indications that this negative bias can occur when depressed patients evaluate stimuli in other domains such as music (Bodner et al., 2007; Al'tman et al., 2000).

Depression affects emotional expression as well. For example in the Renneberg et al. (2005) study they found that depressed patients showed significantly less happy facial expressions when watching short film segments compared to the control group (Renneberg et al., 2005).

Emotion-regulation strategies like rumination and expressive suppression have been linked to depression. Joormann and Gotlib (2010) found that depressed participants exhibited lack of inhibition when processing negative material. Reduced inhibition of negative material was associated with greater rumination within the group of depressed participants. Additionally within the formerly depressed group, less use of reappraisal, more use of rumination, and

greater expressive suppression were related to higher levels of depressive symptoms. (Joormann & Gotlib, 2010.)

Depression has been especially related to problems expressing and regulating negative emotions like anger. The early psychoanalytic theories have suggested that depression was caused by the suppression of anger, and a turning of those feelings against the self (Blatt, 1998). Depressed patients' tendency to suppress anger has been shown in many studies. In a study of Riley et al. (1989) they found that depressed patients suppressed their anger more often than either participants from the posttraumatic stress disorder group, or the healthy control group. Additionally the more severely depressed patients showed higher levels of hostility and anger than the less depressed patients. (Riley et al., 1989.) In another study, depressed patients scored significantly higher than non-depressed controls on self-report measures of anger and anger suppression regardless of whether the target of anger was the spouse or other people (Goldman & Haaga, 1995). As a conclusion we can say that depression causes a lot of emotional problems in emotion recognition, emotion expression and emotion regulation. The next question is why concentrate on music when dealing with depression related problems of emotion?

2.3 Music and emotions

It is well known fact that music can be used as a powerful mood inducer (Martin, 1990; Västfjäll, 2002). It can be said that music is an area of life, which is familiar to most people. According to Gaver and Mandler (1987) the use of music stimuli in emotion studies is ecologically valid, because we make judgments in our everyday life about the music we hear and are aware of our affective responses to music that we listen to. One advantage of music stimuli is that it avoids many of the ethical concerns related to other kinds of stimuli, like drugs and medication. Music as stimuli is safe, economical and easy to use. There is also research about the emotional responses to music (e.g., Juslin, 2009), bodily responses to music (e.g., Hodges, 2009), perception of emotions in music (e.g., Gabrielsson, 2009) and emotion regulation by music (e.g., Saarikallio & Erkkilä, 2007), which also supports the use of music stimuli in emotion studies.

Emotional power and possibilities of music is used systematically in music therapy practice to enhance a person's health and well-being. Psychological and physiological responses to music are the essence of music therapy work.

2.4 Music therapy

Music therapy is one form of creative arts therapies (music therapy, dance-movement therapy, art therapy, drama therapy), in which different elements of music (rhythm, harmony, melody, timbre, tempo, dynamics) and client-

therapist interaction are used for therapeutic purposes. According to Bruscia (1998a) "Music therapy is a systematic process of intervention wherein the therapist helps the client to promote health, using music experiences and the relationships that develop through them as dynamic forces of change" (Bruscia, 1998a). This definition includes many important aspects about music therapy work. Music therapy is always a systematic process, and therefore goal-oriented. There should always be a clear purpose why music therapy is used. A client comes to music therapy for a certain reason and the goals of the therapy are set based on that reason. Music therapists try to achieve the aims set in the therapy process by using research-based interventions.

In music therapy there are two main approaches, receptive and active. The receptive approach is based on music listening. The music therapist offers receptive experiences to the client by using live or recorded improvisations or compositions by the client or therapist or commercial music from different music genres. In the active approach the main methods of music therapy are improvisation, playing or singing pre-composed music or making one's own music. In the active approach the music therapist encourages clients to express their emotions externally by creating musical sounds and structures.

Bunt and Pavlicevic (2001) have listed three different sources of emotion in music therapy practice. The first is related to associative connections triggered by music. Music can work as a trigger for a wide range of associations with specific events, places, memories and people, which have been significant in the client's life. The second source is iconic connections, which means that clients can link musical characteristics to some external musical event or human feeling. An example can be a child in music therapy naming his improvisation as a "Sunny day" because the music sounds like that to him. The third source is intrinsic connections, which links the client's emotional experiences to different aspects of the music. (Bunt & Pavlicevic, 2001.)

Music therapy can promote a client's emotional processing and help to recognize and express emotions. This is why it is implemented in the treatment of mood disorders, like depression.

2.5 Music therapy in the treatment of depression

Medication together with psychiatric counselling is the most common combination in the treatment of depression. Psychotherapy has also been found to be effective, especially when combined with medication (e.g., Greenberg & Goldman, 2009; Casacalenda et al., 2002; Cuijpers et al., 2009). Sometimes verbal psychotherapy processing is not possible or is insufficient for depressed patients and in those cases music therapy could be an alternative therapy form.

There are many encouraging clinical experiences about using music therapy in the treatment of depression. In recent years also some studies have been conducted in the use of music therapy for depression. Five of them were included for the recent Cochrane review "Music therapy for depression" (Maratos

et al., 2008). Four studies were randomised trials (Hanser, 1994; Chen, 1992; Zerhusen, 1995; Hendricks, 1999) and one was a controlled clinical trial (Radulovic, 1997). Hanser (1994), Chen (1992) and Radulovic (1997) compared music therapy plus standard care to standard care alone. In Hendrick's study (1999) music therapy plus standard care was compared with CBT plus standard care. Zerhusen (1995) used three different groups by comparing music therapy plus standard care, cognitive-behaviour therapy plus standard care, and standard care only.

In Hanser's study participants were diagnosed with mild to moderate depression and music therapy intervention involved music listening with a therapist in an individual setting. The length of the music therapy treatment was a one hour session weekly over eight weeks. The primary outcome in Hanser's study was the Geriatric Depression Scale (GDS). Mean scores at the end of treatment in the music therapy plus standard care group were 10.00 (SD = 6.15) and in the standard care only group 16.20 (SD = 6.13). (Hanser, 1994.)

Chen investigated the effects of active music therapy, which included the teaching of pre-composed melodies and dialogue between the therapist and the client. Intervention was very intensive, six 90 minutes sessions per week during eight weeks. The primary outcome of this study was the Hamilton Rating Scale for Depression (HRSD). Percentage reduction in score on HRSD from baseline to end of treatment was 98% in the music therapy group and 67% in the control group. (Chen, 1992.)

Radulovic (1997), Hendricks (1999) and Zerhusen (1995) all used music listening as music therapy intervention in their studies. In Radulovic's (1997) study intervention was applied as a 90 minutes session twice a week for six weeks. The primary outcome was the Beck Depression Inventory (BDI). The mean score on the BDI at end of treatment was 16.5 among the music therapy group and 25.1 among the control group (Radulovic, 1997).

In Hendricks (1999) study music therapy intervention consisted of one-hour sessions once a week over eight weeks. The primary outcome was the BDI and mean BDI scores at end of treatment were 1.34 among the music therapy group and 17.0 among those randomized to group cognitive behaviour therapy (Hendricks, 1999).

Zerhusen (1995) used music therapy as an active control group in the trial of CBT. Music therapy was offered in group form in one-hour sessions twice per week for ten weeks. The primary outcome measure was the BDI and mean scores at the end of treatment were 28.63 in the cognitive behaviour therapy group, 45.58 in the music therapy group and 47.84 in the standard care group. (Zerhusen, 1995.)

According to Maratos et al. (2008) the reporting of the above-mentioned studies was poor. In particular information about randomization procedures was partial or absent. However these studies demonstrated that it is possible to conduct randomized controlled trials of music therapy for depression. Despite the lack of methodological quality, these studies have shown the positive effects of music therapy in reducing depressive symptoms. A noteworthy aspect is that

levels of uptake and participation in music therapy appear to be high, and drop-outs are rare. (Maratos et al., 2008.) All these indicate that further research with better methodological quality and clearer focus on clinical theories and working methods in this area is needed.

2.6 Music therapy based on clinical improvisation

In this research the client group was depressed patients and the aim of the music therapy was to decrease depression symptoms. To achieve this aim, music experiences, client-therapist relationships and verbal reflection were used, all of which are the main elements of music therapy work. Music experiences in music therapy can vary from receptive music listening to active music making. One form of active music making in music therapy is improvisation. In this research improvisation was the main music therapy method used and the ideas and principles of Erkkilä's (1997, 2004), Wigram's (2004) and Bruscia's (1987, 1998b) improvisational music therapy, and the application of ideas of analytical music therapy by Priestley (1994) were implemented.

In improvisation the client makes up music spontaneously alone or together with the therapist. Spontaneous music making means that there are no certain rules how to play or what to play. Clients don't need to be musically trained or have any musical background for participating in music therapy improvisation. It is more like playing and exploring with sounds and expressing emotions, thoughts and ideas through sounds. This kind of free self-expression through music and sounds enables one to connect with her emotional memories and images and offers an open stage for transferences and creative imagery (Erkkilä, 1997; Erkkilä, 2004; Erkkilä et al., in press).

The clinical goals of improvisation experiences can be for instance establishing a nonverbal channel of communication and a bridge to verbal communication, developing creativity, expressive freedom, spontaneity and playfulness (Bruscia, 1998a). These are all very important aspects and goals when working with depressed patients because in depression emotional communication and expressions are often dysfunctional. Improvisation is very sensitive musical experience where the client needs to feel herself safe enough to be able to let go, to be able to express her inner feelings and share them with the therapist. That is why the client-therapist relationship is so crucial in this work.

In this study music therapy was offered in an individual setting and it was anchored theoretically in a psychodynamic music therapy tradition, which argues that emotions, metaphors, associations and images are also core elements of musical experiences (De Backer, 2008; Erkkilä, 1997; Erkkilä et al., in press; Eschen, 2002; Priestley, 1975; Priestley, 1994; Bruscia, 1998b; Wigram et al., 2002). This means that the role of musical improvisation is to activate the client's symbolic process and let her act creatively through music, and bring unconscious material to the pre-conscious level, which then becomes possible to process further, verbally. Creativity can be seen as a core element of the de-

pressed patients' recovery process in improvisational music therapy. In Erkkilä's et al (in press) model of the recovery process (Figure 4) in improvisational psychodynamic music therapy (IPMT) improvising is seen as therapeutic when it is linked to the term that Winnicott's (1968) coined as "potential space" (holding environment between the therapist and client) and presupposes certain commitment, passion and motivation. The creative act of improvisation triggers images, emotions, symbols, memories and associations, which can be seen as a window to the client's unconscious (Erkkilä, 2004). When these creative insights are linked to the client's everyday life it can gradually lead the client implement these insights into reality. (Erkkilä et al., in press.)

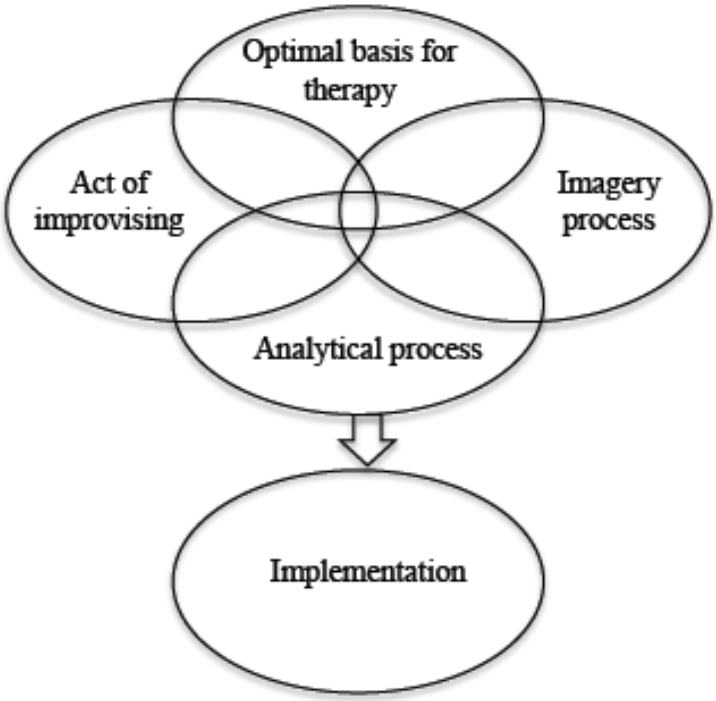

FIGURE 4 Model of the recovery process in IPMT (Erkkilä et al., in press)

The offered amount of individual music therapy was 20 biweekly sessions, each lasting 60 minutes. The selection of instruments was reduced to the use of mallet midi instruments, electronic hand drums, and Djembe-drums. This setting enabled musical interplay and expression both in rhythmic and melodic-harmonic way, but was easy enough for everyone to employ. All music produced in the sessions was recorded to computer, and it was possible to listen to these during the same session or afterwards for further processing and discussion on emerging themes. No other listening of music was used as a method. (Erkkilä et al. 2008.)

The role of the therapist in this study was to actively facilitate and support the depressed patients' recovery process by using musical improvisations combined with reflective discussion. The basic principle in the sessions was to encourage and engage a client to expressive musical interaction. The aim was to establish a shared creative space for providing favorable conditions for the therapeutic change. The starting point for musical improvisation was either free or referential, i.e. based on a certain topic or theme. The therapeutic process was based on mutual construction of meaning of emerging thoughts, images, emotions, and expressive qualities. In practice, musical expression and verbal discussion were taken in turns, and this was individually modified depending on the personal needs and conditions of a client. Because of the special setting and frame of research therapy (limited time and amount of sessions), a psychodynamic framework was applied in therapeutic processing emphasizing a more supportive and resource-based approach and strategies. (Erkkilä et al. 2008.)

Improvisation is an integrative experience where bodily, emotional and cognitive levels of experience are present at the same time. In musical improvisation the whole body is used to express intentions, emotions and thoughts. At the same time music and sounds expressed can be heard and that makes musical improvisation such a special form of self-expression. Improvisation experience can raise up important emotions, memories and images, which can be shared and processed further with the therapist. In this way the client is able to construct meanings and get insights from emerging sensations, emotions, thoughts and images.

One example of the recovery process can be given from Sofia's music therapy. In the beginning of the therapy process Sofia's improvisations had very clear structure, which indicated Sofia's insecurity and need to control the situation. Gradually in session 8 she was able to liberate herself from the strict structure and she started to play around, trying to find new ways to express different emotions through the mallet instrument. That made her smile and she felt herself more calm than usual. Symbolism also appeared more and more in her playing. In the beginning we approached instruments with the idea to find out what kind of sounds we could create with them. Little by little she started to play about her relationships and get more in touch with her real feelings, like anger and sadness. She could express those feelings in her playing and afterwards when we listened to improvisations she could also reflect and verbalize her experience.

Session twelve was a clear turning point in Sofia's therapy process. It was also very meaningful when evaluating the development of her symbolic process through improvisation. In the initial discussion Sofia told that she had felt very anxious during the day and tried to regulate her anxiety through different activities. She said that she really needed something new in her life.

The starting point to our improvisation was to express present feelings through sounds. What followed was a 30 minute long improvisation with the mallet instrument and djembe drum. Sofia began improvisation with low notes and increased the dynamics and intensity of her playing quite soon beginning

to use the whole range of mallet instruments' scale. I followed Sofia's playing and supported her strong emotional expression with my playing. What was different in the characteristics of this improvisation compared to her earlier improvisations was the great use of dissonance and chaos in her playing. There were no more strict limits or restrictions in her musical expression and for the first time she also used the djembe drum of her own will. This was a remarkable progression and change in her recovery because the drums most clearly symbolized aggression and hate, which had been forbidden and frightening emotions to her for many years.

When she reflected her emotional state after the improvisation she spoke of how she felt relieved and much calmer than before improvisation. After some hesitation she also told me that symbolically she went through the act of suicide in that improvisation. This was clearly a symbolic and creative act to express and share something that she had held inside herself for many years. Now she was able to express her anger outwards and experience that other people can tolerate and share her emotions. After this improvisation Sofia's recovery process developed very fluidly. She was able to participate and enjoy activities that she used to love to do but which were impossible for her during severe depression and anxiety.

Music therapy can offer a new and alternative channel for depressed patients like Sofia to express their emotions. This is very important in situations where the client has difficulties to verbally describe her inner experiences. Sometimes music can work as an opening vehicle for verbal expression. In the therapy process there are also phases when thoughts and ideas are not yet clearly formed and musical expression is the main forum for self-expression. For many depressed patients in this study music offered a possibility to express and release their suppressed emotions, for example, anger as in Sofia's case. This released energy to process things further and made it possible to begin to learn to use more beneficial emotion regulation strategies such as reappraisal and self-disclosure in their daily lives.

2.7 The overall structure of the studies

In the whole music therapy and depression project many different kinds of data were collected (presented in Figure 3 in chapter 1) and some of that data will be analyzed and published in forthcoming research articles and master thesis.

In the main RCT-study data were collected about the depression symptoms (MADRS), anxiety (HADS-A), general functioning (GAF), quality of life (RAND-36) and alexithymia (TAS-20). Additionally rest and music listening EEG data, self-reported music perception and preference data and data about participants' personality, musical background, musical preferences and current mood state was collected. We also collected video and audio data from music therapy sessions. The present dissertation research includes the main RCT-study data (not EEG-data) from baseline, at 3 months (after intervention), and at

6 months. The data of two sub-studies were collected at baseline from the depression group (n=79) and from the non-depressed control group (n=30). Music perception and preference data were also collected from depressed patients at 3 months and at 6 months but will be analyzed and published later. The study design for the main RCT-study and sub-studies of perception and preferences of emotions in music is illustrated in Figures 5 and 6.

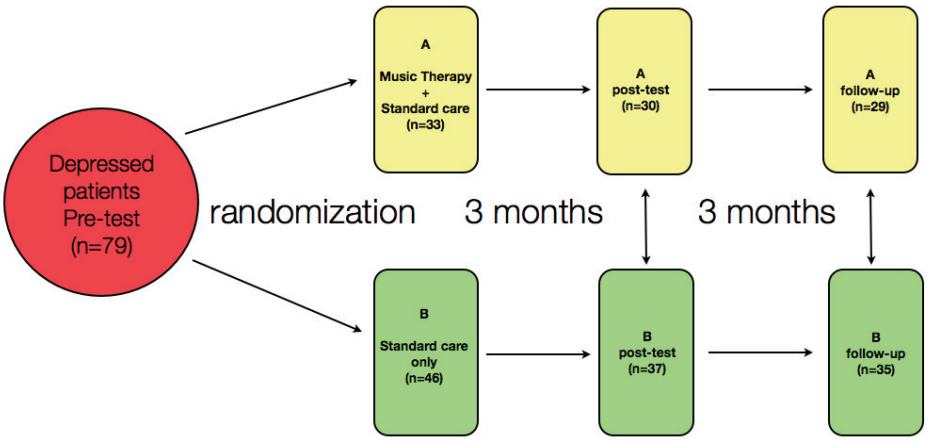

FIGURE 5 Study design of the main RCT-study

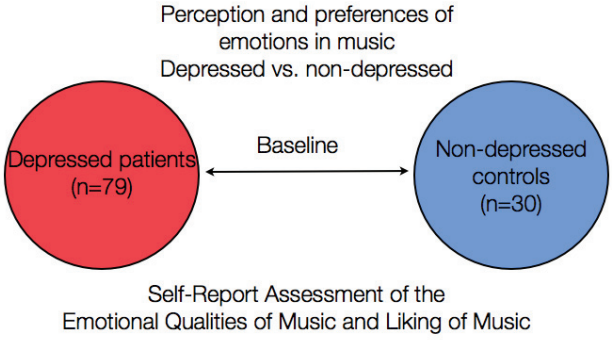

FIGURE 6 Study design of the Perception and Preferences of emotions in music

3 AIMS OF THE STUDY

Depression as a mood disorder is strongly related to problems in emotion-regulation. Music has been linked with deep brain structures involved in emotional processing (e.g., Salimpoor et al., 2009; Blood & Zatorre, 2001). Music provides one of the most effective non-intrusive mood induction techniques (Västfjäll, 2002), and it has been shown to play a central role in the self-regulation of emotions in everyday contexts (Saarikallio & Erkkilä, 2007). Previous studies have shown that depression affects a person's ability to recognize (e.g., Leppänen et al., 2004; Gur et al., 1992; Surguladze et al., 2004) and express (e.g., Renneberg et al., 2005) emotions and that music and music therapy can decrease these problems (e.g., Maratos et al., 2008). The purpose of the present work was to clarify and deepen the understanding of emotion perception and preferences in music and the effectiveness of music therapy in the treatment of depression.

The main RCT-study aimed to determine the efficacy of music therapy added to standard care compared with standard care only in the treatment of depression among working-age people.

The purpose of the first sub-study was twofold. Firstly we established the hypothesis that depressed patients evaluate emotions in music differently from a non-depressed control group. Secondly we wanted to refine the sources of this difference by focusing on the levels and types of clinical condition.

The second sub-study investigated how depressed patients' emotional state and problems in approach and avoidance motivation affect their preference ratings of musical emotions compared to non-depressed controls.

4 STUDIES

The current research process consisted of the main RCT-study about the effectiveness of individual music therapy for depression and two sub-studies about emotional recognition and preferences of music by depressed patients compared to non-depressed controls in the initial phase of RCT-study. The aims, methods, and results of each study are summarized below. The studies are described in more detail in the original publications. The main study (RCT) is presented in paper I, the first sub-study in paper II and the second sub-study in paper III.

4.1 Individual music therapy for depression: Randomised controlled trial

Music therapy is creative art therapy form where music experiences together with the client-therapist relationship are used for the purpose of therapeutic change. In music therapy different kinds of music experiences can be used. The most typical are music listening, playing, singing and clinical improvisation. Music therapy can be individual or group therapy and the role of verbal reflection and the degree of structure can vary a lot depending on the need of the client.

In previous studies of music therapy for depression there have been some limitations in methodological quality such as lack of information about the randomization procedure and in clearly describing music therapy interventions and theoretical backgrounds. For this reason we wanted to give special attention to clinical methods and theories as well as for randomization procedure in our study. Ten music therapists took part in the study. They all had professional training in music therapy and for treatment fidelity all the therapists participated in an additional extensive training before the study. Treatment fidelity can be defined as treatment integrity, i.e. was the treatment condition implemented as intended (Moncher & Prinz, 1991). This training lasted 15 months

and the aim was to achieve a common understanding about the theoretical and clinical fundamentals of the music therapy model used in this study. My role in this phase was to be one of the trainers and also one of the therapists for the study.

The aim of this study was to determine the efficacy of improvisational, individual music therapy added to standard care compared with standard care only in the treatment of depression among working-age people.

Participants (n=79) with an ICD-10 diagnosis of depression were randomized to receive individual music therapy and standard care (twenty bi-weekly sessions) or standard care only, and followed up at baseline, at 3 months (after intervention), and at 6 months. Clinical measures included depression, anxiety, general functioning, quality of life and alexithymia. The primary outcome measure of the study was the Montgomery and Åsberg Depression Rating Scale (MADRS) (Montgomery & Åsberg, 1979). The secondary outcome measures were the anxiety part of the Hospital Anxiety and Depression scale (HADS-A) (Zigmond & Snaith, 1983), Global assessment of general functioning (GAF) (Hall, 1995; Jones et al., 1995), RAND-36 (Aalto et al., 1999) for measuring the quality of life, and Toronto Alexithymia Scale (TAS-20) (Taylor et al., 1985) for evaluating alexithymia.

Participants receiving music therapy and standard care showed greater improvement than those receiving standard care only in depression symptoms (mean difference 4.65, 95% CI 0.59 to 8.70), anxiety symptoms (1.82, 95% CI 0.09 to 3.55) and general functioning (-4.58, 95% CI -8.93 to -0.24) at 3-month follow-up. The response rate was significantly higher for the music therapy plus standard care group than for the standard care only group (odds ratio 2.96, 95% CI 1.01 to 9.02).

This study demonstrated clearly that individual, improvisational music therapy is effective in decreasing symptoms of depression. It helped depressed patients to find new ways to express their emotions. They also learned to tolerate and regulate their emotions in a better way. It is clear that depression affects the representation and regulation of emotion but what are these effects exactly. To answer these questions we conducted two sub-studies to investigate the perception and preferences of emotions in music by depressed patients.

4.2 Biased emotional recognition in depression: Perception of emotions in music by depressed patients

Depression impairs a person's social skills and also their quality of life. Impairments in the ability to recognize and discriminate other people's affective states can have remarkable repercussions on a person's social and interpersonal relations.

The aim of this study was twofold. Firstly we established the hypothesis that depressed patients evaluate emotions in music differently from a non-

depressed control group. Secondly we wanted to refine the sources of this difference by focusing on the levels and types of clinical condition. This led us to the following hypotheses: 1. Depressed patients demonstrate a marked negative bias in evaluating perceived emotional qualities of music (i.e., higher ratings for sadness, fear and anger and lower ratings for happy and tender emotions) when compared to non-depressed controls. 2. The degree of this negative bias correlates with the severity of depression. 3. The degree of negative bias also correlates with the severity of an anxiety problem, if there is one (comorbidity). 4. Depressed patients with alexithymia will repeatedly underestimate the perceived emotional qualities of music compared to those without alexithymia (their mean ratings across all emotions are lower).

To investigate the above-mentioned hypothesis both healthy (n=30) and depressed (n=79) participants were presented with a set of 30 musical excerpts, representing one of five basic target emotions. The excerpts of music came from a previous study by Eerola and Vuoskoski (2011) and represented unfamiliar clips from film soundtracks. In this behavioral experiment participants assessed the emotions perceived in 15-second excerpts of music by using a method of self-report measures. Each participant was given a 9-point Likert scale for each of the five emotions to be rated (anger, fear, sadness, happiness and tenderness). The participants evaluated the excerpts individually, and in a randomized order, using a computer interface and headphones by rating each excerpt after a self-paced playback of the excerpt. For each example they were asked to rate the amount of each of the five emotions from 1 to 9 (where 1 represented "none at all" and 9 "very much" of a given emotion) and focus on the emotions music seemed to represent (perception of emotions instead of felt, experienced emotions).

Depressed patients showed moderate but consistent negative self-report biases both in the overall use of the scales and their particular application to certain target emotions, when compared to healthy controls. Also, the severity of the clinical state (depression, anxiety and alexithymia) had an effect on the self-report biases for both positive and negative emotion ratings, particularly depression and alexithymia.

4.3 Biased Emotional Preferences in Depression: Decreased Liking of Angry and Energetic Music by Depressed Patients

Depression has been associated with low levels of energetic arousal, delays in approach and avoidance processes, and problems expressing and regulating negative emotions such as anger.

The aim of the study was to investigate how a depressed patient's emotional state and problems in approach and avoidance motivation affect their preference ratings of short 15 second music excerpts representing different points in the affective space described by 2 extremes of affect dimensions (va-

lence and energetic arousal), as well as 3 basic emotions (anger, sadness, and happiness). Our hypotheses were that depressed patients' preference ratings are significantly lower than those of non-depressed controls, for music excerpts expressing high negative and positive valence, high energetic arousal, and anger. As a control for the high energy excerpts, we looked at low energy excerpts in which we didn't expect to observe any difference between the groups. As a control for the anger examples, we looked at ratings for stimuli that exhibited a negative emotion related to avoidance behavior (sadness) and on a positive emotion related to approach behavior (happiness). For these emotions, we didn't predict any difference between the groups.

In this behavioral experiment, both healthy (n=30) and depressed (n=79) participants were presented with 2 sets of 30 musical excerpts that represented the basic emotions (anger, sadness, and happiness), as well as different points on the 2-dimensional model of emotions (valence and energetic arousal). Music examples came from a previous study by Eerola and Vuoskoski (2011). Music examples represented unfamiliar excerpts from film soundtracks, selected and evaluated initially by an expert panel and further validated with a larger, non-clinical population. Participants rated how much (the amount) they liked each excerpt individually and in a randomized order, using a 9-point Likert scale, and using a computer interface and headphones. Procedures for both groups were identical.

The preference ratings for highly positively and negatively valenced excerpts didn't differ significantly between groups. However, the presumed trend was apparent in both cases, in which the clinical group exhibited lower preference ratings for excerpts with both a high positive valence and high negative valence, in comparison with the non-depressed controls. Ratings for high-energy examples were significantly lower in the clinical group than in control group. For the low energetic arousal examples there was no difference between groups. For anger examples the depressed patients' mean ratings of preference were clearly lower than the control's mean. There were no differences between groups with sad and happy examples.

5 DISCUSSION

The current work explored the efficacy of music therapy in the treatment of depression and the effects of depression on perception and preferences of emotional qualities of music. The general findings, limitations and implications of the current research are discussed below.

5.1 Music therapy in the treatment of depression

This study was the first RCT on improvisational music therapy for depression and was designed to fill an important gap in knowledge and response to the limitations of previous randomized controlled trials on music therapy for depression. In our study we defined the clinical method very clearly, directed the study for working age people and improved the methodological quality.

The main contribution of the current research is related to the efficacy of music therapy for depression and negative emotional bias demonstrated by depressed patients. The main RCT-study showed that improvisational, individual music therapy added to standard care helps patients with mild, moderate or severe depression to decrease their levels of depression, anxiety and increase functioning. The response rate in this study was defined as a 50% or greater decrease in depression symptoms measured with MADRS. The response rate in the experimental group was significantly greater (45%) than in the control group (22%). The number needed to treat was four, which means that one patient will change from no response to response for every four patients to whom music therapy is offered. A very interesting finding from this study also was the high attendance rate for music therapy. Average attendance was 18 sessions out of 20. This shows that depressed patients felt music therapy to be a very motivating form of therapy. The study confirmed the earlier findings about music therapy's positive effects in decreasing symptoms of depression and its motivated nature as a creative therapy form which integrates active music making and verbal reflection (e.g., Maratos et al., 2008).

Clinical improvisation as a method of music therapy offers a lot of possibilities for both client and therapist, because there are many variations on how to use it in clinical work. The client and therapist can improvise together or sometimes the client or therapist can improvise alone. To feel safe enough in themselves some clients need more structure and support for improvisation than others and that aspect can be easily adjusted based on the client's needs. This kind of flexibility and variability of clinical improvisation was a very important factor in the therapy processes with depressed patients. When a client felt insecure in herself and there was need for more structure, the therapist limited the possibilities of improvisation, for example, by giving instructions to use only certain notes of an instrument or giving a certain theme for improvisation.

The therapist can also give support for the clients' play by using specific improvisation techniques in his own play. These are for example, mirroring, imitating, matching, empathic improvisation, reflecting, grounding, holding and containing (Wigram, 2004). Mirroring means that the therapist does at the same time as the client exactly what the client is doing musically, expressively and through body language. Imitating means that the therapist will reproduce the client's playing after it is finished. Mirroring and imitating are techniques that should be used very sensitively because they can be quite confronting to some clients. Matching is an empathic method where the therapist responds to the client's playing with music that is compatible and matches the client's style of playing. Empathic improvisation and reflecting are techniques, which require a response from the therapist that is more specifically connected to the client's emotional state. Grounding means that the therapist creates a stable and containing music that works as an anchor to the client's music. Holding and containing are quite similar methods. Holding provides a musical anchor and container for the client's music making. Containing means that the therapist offers structure by his music to the client's chaotic music by providing a clear pattern. This will give to the client a permission to be chaotic in her music because the therapist is able to contain that music. (Wigram, 2004.)

Sometimes it can be very meaningful for a client to improvise alone and the therapist's role is to witness that. To become seen and heard by the therapist is a powerful experience for a client. Interaction between client and therapist develop and deepens through the combination of musical and verbal communication. For many participants in the music therapy group, musical improvisational experiences led them to insights of certain aspects of their psychopathology as the experiences were further processed in verbal reflection. That means that musical, improvisational expression and interplay between client and therapist can trigger the client's unconscious material and emotions and offer a stage for symbolic expression. This symbolic distance during musical expression will make it easier for depressed patients to face and express painful emotions and memories. As I was also one therapist in this study I was privileged to witness how participants were able to express themselves differently through music and get insights about their life while reflecting verbally their improvisa-

tional experience. One example can be given from Sofia's therapy process. When we started our tenth session Sofia was very anxious about what had happened to her during the day. I helped her to regulate her anxiety through a guided breathing exercise and then she chose the theme for improvisation. She wanted to explore her emotions through playing. In the beginning the music was very soft but gradually more dynamics, strength and playful exploration appeared in her playing. I supported her playing by using empathic improvisation and reflecting techniques and encourage her to continue. In verbal reflection Sofia told me that she was able to express herself in a new way. Our interactive play with the djembe drums encouraged her to try more energetic and joyful ways of expression. This made herself much calmer and grounded in the present moment. I helped her to stay in that feeling and be aware of sensations, images and thoughts related to that. This experience became an anchor, which we used later in Sofia's therapy process for grounding and self-regulating purposes.

This study was larger and more rigorous than previous studies about music therapy and depression. We designed this study to address the most policy-relevant question of interest whether music therapy is superior to the standard care only. In a simple two-arm design we were not addressing the mechanism of change or the specific ingredients of music therapy. One common criticism for this kind of study design is that there is no second control group that would receive some other activities in the same amount as the intervention group. This is of course one limitation of this study because we are not able to say that it was specifically music therapy, that caused the results. Another criticism from common factors research in psychotherapy (e.g., client characteristics, therapist qualities, treatment structures and relationship elements) is the varied effect of therapy across therapists. We examined this and found no such indication. This lack of significant variation of effects between therapists might be an indication that the effect of music therapy shown in this study was based on the music therapy method utilized. Cost-effectiveness or other health economic analysis was not included in this study, but would be relevant and useful for future studies.

5.2 Perception and preferences of emotions in music while depressed

Sub-study 1 yielded two main results. Firstly depressed patients' emotional evaluations were negatively biased, which was shown in their ratings on the scales of anger and sadness across all music excerpts compared to healthy controls. This bias was also shown in the patterns of misinterpretation and confusion they made between emotion scale and target emotions. Interestingly these confusions were prevalent especially in the anger ratings. It was shown that depressed patients gave significantly higher anger ratings for fear and sadness

examples than healthy controls. Another interesting finding was that depressed patients gave higher ratings of sadness for tender examples compared to non-depressed controls. This also demonstrated how positive emotions were mistaken for negative ones by depressed patients. Additionally depressed patients gave lower happiness and tenderness ratings for happy and tender examples. The second main result was related to the misinterpretation of musical emotions, and possible reasons for the negative bias in depressed patients. It was shown that severely depressed patients gave significantly higher ratings of anger for the fear examples than patients with milder depression. Additionally alexithymia and the interaction between depression and alexithymia showed a significant difference in the overall use of anger, fear and tenderness scales. We found that depressed patients with alexithymia gave lower ratings than depressed patients without alexithymia.

There are several methodological advantages in this study. We made a clear distinction between the perception and induction of musical emotions and focused only on perceived emotions, because it is less dependent on individual and contextual factors (Juslin, 2009). Additionally the recognition of emotions lead more directly to clinically relevant applications related to the diagnosis of depression. Another strength was the music selection used in this study. We chose to use a large number of real, non-artificial and non-familiar music excerpts, which were tested in a previous study with a non-clinical population (Eerola & Vuoskoski, 2011). We also assessed many individual factors like personality, mood state and musical preferences, but found differences between groups only in mood state and personality factors. These differences reflected typical tendencies related to depression. We used a bigger sample size than in earlier music stimuli studies with depressed patients (Al'tman et al., 2000; Bodner et al., 2007).

One limitation of this study is that we only used music stimuli. If other stimuli would have been employed, we could have linked our findings to the earlier studies in non-music domains. Another limitation is that we only used very clear music examples representing five basic emotions. If we would have included neutral or ambiguous stimuli the results might have been different. Also, explicit evaluations of emotions may involve a higher decisional process and not only reflect affective processing, which could be studied by applying an affective priming paradigm to depressed patients.

Sub-study 2 focused on preference ratings of musical emotions and raised valuable information about the depression. This study showed that depressed patients' preference ratings differed in target emotions of energy (in terms of the dimensional model of emotions in music) and anger (in terms of the basic emotion model). Depressed patients gave significantly lower preference ratings than the non-depressed controls for examples of music, which were high in energetic arousal and angry. Although at both ends of the valence dimension the ratings of depressed patients were lower than the non-depressed controls, the difference was not significant.

5.3 Depression as an emotion-regulation problem

Depression can be seen as a disorder of impaired emotion regulation. Recent studies have suggested that a problem in emotion regulation characterize currently depressed people and is also evident within people who have recovered from this disorder (Ehring et al., 2008).

Self-regulatory capacities develop through early attachment relationships. The primary caregiver helps the child to regulate her arousal and emotional states through interactive regulation. When this finely attuned interaction between caregiver and the child is re-enacted appropriately time after time, it will expand the child's internalized template of safe relatedness and strengthen little by little the child's capacity to autoregulate her emotions (Schore, 1994; Siegel, 1999). From Schore's (2003) perspective, "affect regulation is not just the reduction of affective intensity, the dampening of negative emotion. It also involves an amplification, an intensification of positive emotion, a condition necessary for more complex self-organization" (p.78). If interactive regulation doesn't work for some reason between caregiver and the child, or if a caregiver is not available for the child, it will leave the child alone with intolerable emotions. As an ongoing situation this will lead the child to internalize insecure or in worst cases disorganized-disoriented attachment patterns (e.g., Ainsworth et al., 1978; Main & Hesse, 1990). In these cases, which were also evident in our study sample we can talk about developmental trauma, which can mean emotional neglect and a constant feeling of insecurity and may lead to depression and anxiety later in life.

Rumination has been in focus in the majority of studies investigating emotion regulation in depression. Rumination is said to be a particularly detrimental response to negative affect, because it hinders recovery from negative mood and in this way prolongs depressive episodes (Nolen-Hoeksema et al., 2008). Rumination has two subcomponents, reflective pondering and brooding. Reflective pondering is said to be an adaptive response to negative events and mood states but brooding has been related to depression risk because of its maladaptive nature (Treynor et al., 2003). According to Nolen-Hoeksema (1991) rumination is a style of thought rather than just negative content (Nolen-Hoeksema, 1991). Ruminative thoughts have been associated with vulnerability to the onset of depression, the recurrence of depressive episodes, and the maintenance of negative affect (Nolen-Hoeksema, 2000; Nolen-Hoeksema et al., 2008). Rumination is not the only emotion regulation strategy that has been linked to depression. Also the more frequent use of strategies like expressive suppression, thought suppression and catastrophising have been related to levels of symptoms of depression and anxiety (e.g., Campbell-Sills et al., 2006; Garnefski and Kraaij, 2007; Gross & John, 2003). According to John and Gross (2004) the use of suppression is related to lesser positive emotion and greater negative emotion experience when the use of reappraisal is related to greater positive emotion and lesser negative emotion. In interpersonal functioning and

well-being suppression is related to lesser closeness and poorer psychological health in contrast to reappraisal, which is associated with better psychological health. (John & Gross, 2004.)

In the main RCT-study where we used active music therapy intervention in the individual therapy setting, emotion regulation strategies like rumination, suppression and catastrophising were evident. Krista's case was one touching example of that. She felt herself very isolated and incapable of making changes in her life. In the beginning of the therapy process she was talking about her negative emotional state and feelings of hopelessness again and again. She felt that she didn't have skills to handle her strong and negative emotions. She was very frustrated and disappointed with herself.

Our music therapy intervention, based on active doing and participating in active musical improvisation, was important to many participants in the experimental group. Improvisational musical expression was a motivating and safe enough way to begin to learn self-disclosure instead of expressive suppression. It was possible to express inner pressure and emotions with musical instruments. Improvised music worked also as an interactive emotion regulator and improvisations helped some clients in developing their emotional autoregulation skills. This happened to Krista in her seventh therapy session. Krista told me that she was too afraid to express her angry feelings to her father. She felt herself very anxious because she needed to keep her anger inside of her. I suggested to her that she explore those feelings in djembe improvisation. We started to improvise together and she was able to express her anger and frustration through drumming. After the improvisation she felt herself relieved and energetic. She was surprised at how our improvisation had changed her emotional and physical state. This was clearly an important insight to her that she was able to regulate her emotions through active music making and musical expression.

Participants sometimes described their musical expression experience as cathartic. This led them to feel themselves in a new way, capable to deal with difficult emotions, which before was denied and rejected. Musical, improvisational expression, which activates the whole body and is spontaneous, led on many occasions to corrective emotional experiences in further verbal processing. Our findings from sub-study 2, concerning depressed patients' dislike of examples that manifest high energetic arousal and anger, could be used systematically in music therapy practice. In music therapy, depressed patients can learn safe ways to express their suppressed emotions through musical expression, which could disinhibit suppression, and release energy from the avoidance system into the approach system. This would gradually help the depressed patients to learn to use more beneficial emotion regulation strategies such as reappraisal and self-disclosure.

5.4 Dealing with anger

Approach and avoidance motivation and behavior has also been linked to emotion-regulation strategies (Elliot & Thrash, 2002). It has been proposed that avoidance behavior (Barlow et al., 2004; Leventhal, 2008) or inadequate progressing of approach and avoidance processes lead to depression and anxiety disorders (Carver & Scheier, 1998).

Although negative emotions have been generally thought to be avoidance-oriented and positive emotions to be approach-oriented, anger seems to be an exception (e.g., Harmon-Jones & Allen, 1998; Harmon-Jones & Segilman, 2001). As was shown in sub-studies 1 and 2 anger seems to have a special role in depression. In sub-study 1 depressed patients gave significantly higher anger ratings for fear and sadness examples than healthy controls and in sub-study 2 depressed patients gave significantly lower preference ratings for the anger examples than non-depressed controls. The reasons for these results might be rooted in the meaning and role of anger in depression. It has been quite a common clinical observation that depressed patients have repressed feelings of anger and overall problems with the experience and expression of angry feelings (Blatt, 1998; Busch, 2009) and this was evident also in therapy processes in the main RCT-study.

In therapy processes it was quite common that participants felt that anger was something that they were not allowed to feel and express. Expression of anger led very easily to the feelings of guilt. In these situations symbolic distance offered in musical activity enables expression of this forbidden emotion in a safe and tolerable way. This aspect of active doing is rather unique property of music therapy and seems to be a meaningful dimension for dealing with difficult emotions like anger. The special role of anger is also linked to its destructive aspect. Quite often people forget that anger has also many positive aspects related to defending yourself and fight for your rights and justice. In music therapy many depressed participants learnt that anger was justified feeling and important power for change in their lives and it was possible to express it in a non-destructive way.

5.5 Music as a diagnostic tool

Sub-study 1 showed that depressed patients' perception of emotions in music differs from that of non-depressed controls. Depressed patients emotional evaluations were negatively biased and the severity of their clinical state affects the level of negative bias. That raises a possibility that this kind of self-report measure could work as a diagnostic tool for depression. The procedure is very simple and it only takes about 30 minutes for a patient to complete the evaluation. This would also give additional, valuable information for clinicians about a depressed patient's state by using her perception of music. Traditionally depres-

sion is diagnosed by using depression scales like BDI or MADRS where the patient evaluates her life situation based on different statements. This is quite a subjective way to evaluate a person's clinical state. The assessment of the emotional qualities of music could work as a more objective tool in diagnostic work, because it is not based solely on cognitive domain and patients don't know "the right answers".

There is of course need for further research before this perceptual evaluation of music could be used for diagnostic purposes. First it would be necessary to answer the question whether the negative bias represented by depressed patients is solely dependent on this clinical state or reflects more permanent trait abnormalities (like an extreme level of neuroticism). If recovery from depression also eliminates the negative bias in self-report measures of perceived emotions in music, it would give more support for the concept of using music as an additional diagnostic tool for depression.

5.6 Future directions

In the main RCT-study the trend towards reduction in alexithymia was seen both at 3 and 6 months, even though it was not significant. This was a very interesting trend especially when the reduction seems to continue even after the music therapy intervention. Difficulty describing feelings, difficulty identifying feelings and externally-oriented thinking are the main components of alexithymia. Music therapy's putative mechanism of change, like emotion recognition and expression are directly related to the concept of alexithymia. There is need for further research to find out whether music therapy has an effect in reducing alexithymia in people with depression.

Results of the sub-study 1 raise the question as to whether the negative bias represented by depressed patients is solely dependent on this clinical state, or reflects permanent trait abnormality. George et al. (1998) demonstrated in their case study that an inability to recognize emotion in human facial expressions was dependent on the clinical state. In future studies it would be important to investigate whether recovery from a clinical state such as depression would also eliminate the negative bias in self-report measures of perceived emotions in music.

In future research, it would be interesting to study the role of depression and anxiety, separately, concerning the preferences for emotional music stimuli. In the present research, most of the depressed patients (80%) also suffered from anxiety. Feelings of depression are uniquely related to the approach process, whereas feelings of anxiety are uniquely related to the avoidance process (Higgins, 1987; Higgins, 1996). Also, the findings concerning biased emotional preferences in depression should be explored in other domains of emotion stimuli such as faces or affective pictures.

5.7 Clinical implications for music therapy practice

The main RCT-study yielded evidence for the effectiveness of short-term individual music therapy based on clinical improvisation and verbal reflection. In our clinical model we ended up limiting the methods of music therapy to improvisation and listening to improvisations. We also limited the number of instruments to a mallet instrument (a digital mallet midi-controller), a percussion instrument (a digital midi-percussion), and an acoustic djembe drum. In the beginning these limitations raised lots of discussion and suspicions from the music therapists working in this project. At the end of the study it was our experience that this kind of restricted clinical setting worked very well for depressed patients. Participants felt that the instrumentation and method used enabled them to express themselves in a new and satisfied manner.

> *"One great experience for me was when I realized how many new possibilities improvisation offered me for dealing with my depression. With djembe I expressed and released strong emotions and with the mallet instrument I was able to express myself in an even more diverse way than with the drums." Participant*

> *"Music therapy opened up very big blocks in me related to my emotions and expression. By improvising and listening to my improvisations I found many emotional states inside of me, which had been strange for me before. I felt that these experiences have helped me to recover from depression and traumatic experiences." Participant*

Participants didn't feel that there should have been more options with instruments or methods. Even in this restricted setting there were still many choices to make. Which instrument would I choose? Do I want to play alone or together with the therapist? Do I choose a certain theme for my improvisation or keep it open?

5.7.1 Importance of noticing different levels of experience

This study brought up many implications for music therapy practice with depressed patients. One is the importance of being aware and acknowledging different levels of the client's experience in therapy work. In this it is helpful to divide the experience into three levels: sensorimotor, emotional, and cognitive (e.g., Ogden et al., 2006; Punkanen, 2010).

Sensorimotor processing is the capacity for processing through the body. It relies on a relatively large number of fixed action patterns like startle reflex and fight/flight responses, which often take precedence in traumatic situations. Sensorimotor processing involves sequential movement associated with movement impulses, postural changes, orienting responses, physical defensive responses, and autonomic nervous system arousal. Clinical improvisation is a very effective method in evoking bodily sensations. The therapist needs to help the

client to be more aware of her bodily sensations and recognize changes in sensations and behavioral impulses before, during and after improvisation. This can be realized through the therapist's observations, contact statements and questions. In music therapy practice we need to develop our observing skills, which helps us to notice changes of nonverbal components of the client's experience. That is movements and other physical signs of autonomic arousal or changes in body sensation. When we observe changes for example after improvisation we need to help the client to become aware of those changes. For that we can use contact statements or questions. Physical experiences can often remain unnoticed by the client if the therapist doesn't give attention to them through simple statements that describe what has been noticed. Contact statements can assist the client to begin to verbally label the emotional and sensational experiences in therapy. The therapist can also use questions to help the client to sense her body better and to concentrate more on her physical experiences in the here and now. Questions can be divided in general and specific questions. Examples of general questions are "what do you feel in your body?" or "what is your experience on the level of sensation?" Specific questions help a client to discover the details of sensation. Examples of specific questions are "what are the qualities of that sensation?" or "where exactly do you feel that sensation in your body?" (Ogden et al., 2006; Punkanen, 2006.)

The emotional level of experience indicates working with a full range of feelings and encourages the expression and articulation of feeling and affect. It is also important to keep in mind that emotional processing adds motivational coloring to sensorimotor and cognitive processing. (Ogden et al., 2006.) Clinical improvisation promotes interaction between therapist and client. The therapist helps the client to recognize and name her emotions, find ways to express emotions in a wider sense, and learn to regulate strong and overwhelming emotions. The importance of emotion regulation skills will be discussed later in more detailed way.

Cognitive processing is the capacity for conceptual cognitive information processing, reasoning, meaning-making, and decision-making. Cognitive processing necessitates the ability to observe and abstract from experience. The cognitive level of experience is connected to working with a client's thoughts, attitudes, and beliefs. (Ogden et al., 2006.) First, the therapist needs to understand the significance of the client's attitudes and belief system. This means that the therapist must be able to recognize the structures of beliefs and models of attitudes that direct the client's choices and actions in everyday life and also make them visible to the client, through client-therapist interaction and dialogue. In this work, a therapist can use different kinds of belief arguments and ask the client to estimate and assess how valid or true they are to her. Gradually the therapist can begin to challenge the client about how true those beliefs really are and question their usefulness, particularly if they interfere with the goals of the therapy. These kind of restrictive attitudes and beliefs were common among participants of our study. The client must be encouraged to study and work with her own beliefs through interactive action, to offer her experiences of

achievement and capability, thus breaking the vicious circle that has maintained and strengthened the client's negative beliefs and fear of failure. (Punkanen, 2010.)

One example can be given from Maria's therapy. Maria was a 40-year-old married woman with three children. She has been depressed for many years and she also had an anxiety disorder, both were medicated. She felt that she couldn't express her feelings in her relationship and that her husband didn't understand her emotional needs. She felt that she was alone with her feelings of frustration, depression and anxiety. She also noticed her attempt to reach perfection in her activities and her difficulty in setting boundaries, which easily led her to a state of fatigue. She was curious to participate in music therapy but at the same time she was very scared that she would fail. There was an idea in her mind that improvisational music making was some kind of performance where she could fail and embarrass herself. We used the first five sessions to build and create enough safety and trust for creative act to happen. That means gradual, safely limited mutual experiments with instruments and a lot of empathic support and encouragement from the therapist to help Maria feel safe enough. Little by little she started to feel more confident in herself and started to believe that she didn't need to hide and dismiss her own needs and hopes.

5.7.2 Possibility for anger expression

Another implication relates to the role of anger in depression and how to work with it during the therapy process. It became obvious that anger has a special role in depression. The reason seems to be related to its special role as a negative emotion, which is associated with an approach orientation. For many participants anger was dangerous, hidden and denied emotion. It easily evoked feelings of guilt. Participants felt that they were not allowed to express anger. If as a child or adolescent the feeling of anger threatened the working of the family system, as was the case with some of the participants, the only solution was to get rid of it. Denial of anger requires an amazing amount of energy and can finally lead to severe depression and anxiety. It became obvious that one important aim of the therapy process was to help depressed patients to express their anger in safe way. That helped them to release tension related to the prolonged control of anger. Musical improvisation offered a safe, creative and playful medium for anger expression and the therapist could support it by his playing or modeling it to the patient when necessary. After improvisations there was often a clear change in participants' emotional and energy level. As a therapist I could see the change in their posture, facial expression, breathing pattern and more open verbal expression. It was very important to make clients realize that change and become aware of changed sensations and emotions.

5.7.3 Learning emotion regulation skills

When working with depressed clients emotion regulation plays a central role. It is not enough to help clients to express anger and other feelings. They also need

help to tolerate and regulate those feelings as well. The music therapist needs to be an interactive psychobiological regulator for depressed client's dysregulated emotional states. Schore (1994) has divided self-regulation capacity to autoregulation and interactive regulation. Autoregulation is defined as the ability to self-regulate without the help of another. That is the ability to calm down when emotions are getting overwhelmed and arousal state hyperaroused and also self-stimulate when arousal drops too low. Autoregulation is often impaired with depressed patients. They are not able to regulate their emotional states in a sufficient way. They easily go out of their "window of tolerance" (optimal arousal zone) and get hyperaroused (i.e., experiencing "too much" activation) or hypoaroused (i.e., experiencing "too little" activation). Keeping clients within their "window of tolerance" enables them to integrate the information they receive from both internal and external environments during the therapy session. Interactive regulation involves the ability to calm down or to increase arousal by interactions with others. By using interactive emotion regulation strategies, the therapist helps the client gradually to increase her abilities for emotional autoregulation and interactive regulation with people other than the therapist. With depressed patients as well as with other emotional problems it is very important to systematically and gradually increase and develop clients' self-regulation capacity and in that way widen their "window of tolerance" related to arousal level and intensity of emotions (Siegel, 1999; Punkanen, 2006). Sara's case demonstrates beautifully how she was able to find a way to express her anger through musical improvisation but at the same time needed active interactive regulation by the therapist.

Sara was a 30-year-old single woman who lived alone. She had been depressed for two years and had had several short periods in hospital during that time. She had been trained as youth worker and had worked in that area for several years. She had not been able to work since she got depressed. She felt very anxious and didn't see any positive aspects in her life. Her social contacts were very limited and she felt lonely. In the first music therapy session she talked about her negative emotional state and feelings of hopelessness. She told that she didn't have skills for regulating her negative emotions and that made her tired of living and raised thoughts and wishes about death.

Sara became familiar with the working method used in music therapy quite quickly and she always wanted to improvise together with the therapist. This was interpreted as her need for support and her need to use interaction for emotional regulation.

In the sixth session Sara was very defensive and withdrawn. Her energy and arousal level was low. I encouraged Sara to participate in mutual improvisation. During improvisation she expressed some anger towards her father in her playing. After the improvisation she said that this was the first time that she could express something negative towards her father and she felt herself relieved (change from hypoarousal to optimal arousal). However in the next session she was very anxious and spoke about her feelings of guilt (hyperaroused). She felt that she wasn't allowed to express her anger. The next improvisation

was initiated from the idea to find ways of playing in a manner that feels good and safe for her. The music was very soft and harmonious and there was good interaction between her and the therapist during improvisation. When reflecting on the improvisation Sara told of how this time playing gave her feelings of secure and trust. She felt very calm and relaxed in herself (change from hyperarousal to optimal arousal). In the next session she told that the feelings of calmness and relaxation lasted for the whole evening and the next day and she was very surprised and happy about that. She asked if it would be possible to get that improvisation onto a Compact Disc so that she could listen it at home when feeling herself anxious and fearful (insight and integration realized while in optimal arousal). I made the CD for her and she started to use it at home to regulate her unbearable emotions. Beforehand medication was the only way for Sara to regulate strong emotions and the CD became a new and alternative way for interactive regulation. This was the first turning point in Sara's therapy process and shows how clients need to balance between emotional expression and emotion regulation. Without the therapist's active role this would not be possible and would easily lead clients to overwhelming emotional states and emotional reactivity (hyperarousal) or numbing of emotions and disabled cognitive processing (hypoarousal).

5.7.4 The healing forces of exploring and play

In music therapy with depressed patients we should give special attention to the activation of clients' action systems of social engagement, exploring and play and in that way diminish the role of defensive systems. In literature different terms have been used to describe concepts similar to action systems. For example attachment theorists have used the term behavioural systems (e.g., Bowlby, 1982; Cassidy & Shaver, 1999), but also motivational systems (e.g., Gould, 1982; Lichtenberg & Kindler, 1994), functional systems (Fanselow & Lester, 1988) and emotional operating systems (Panksepp, 1998) have been used. Van der Hart et al. (2006) have chosen to use the term action systems because the engagement of each system stimulates particular physical actions like body sensations and movements as well as corresponding mental actions like thoughts and emotions.

Depression affects a person's action systems so that the defense action system dominates that person's perception about herself and the outer world. The defense system activates when a person experiences insecurity, discomfort, or danger. Attachment style is strongly linked to the defense system and two patterns of insecure attachment (insecure-avoidant and insecure-ambivalent) could also be seen in participants of this study. For example in Sara's case she reported many times during the therapy process that she has great difficulty in trusting other people. She was very defensive in the beginning of the therapy but little by little she was able to let herself to enter into social engagement with the therapist. When she felt safe enough, she was able to use her action systems of exploration and play.

According to Panksepp (1998) exploration action system "fills the mind with interest and motivates organisms to move their bodies effortlessly in search of the things they need, crave, and desire" (pp. 145, 53). Activities of exploration often lead to play and play can lead to new ideas and increased exploration. This beautiful and gradually strengthened interaction between exploration and play was clearly visible in our music therapy sessions with depressed patients. Improvisation in music therapy offers a safe and motivating playground for exploration and play. Sounds stimulate to create more sounds and sooner or later the client is in a creative process where the defense system is deactivated and enjoyment of interactive play with the therapist takes over. Two beautiful examples of how improvisation moved the client from the defensive state to exploration and creative play can be given from Sara's process. In the sixteenth session Sara was very anxious about what had happened with her friend the previous night. I helped her to calm down a bit and she chose the theme for improvisation. She wanted to play what she feels right now and what she would like to do with her life. The music was soft but she played around with notes more than usual, tasting the feelings of low notes (which symbolizes her depression and other negative feelings) and high notes (which symbolizes her hope and joy). When reflecting on the improvisation after playing she said that it expressed the possibility to stay calm with those evil and anxious emotions, which try to destroy her. She said that the improvisation symbolizes her wish to face difficult and negative emotions so that she wouldn't panic herself.

During the whole therapy process there were lot of feelings of guilt in Sara's mind and she felt that other people's wishes had directed her choices in her life. In the nineteenth session she started to realize that she should listen to her own needs and wishes and start to live her life for herself. These thoughts activated strong feelings of sadness, which she was able to feel and stay with. She wanted to play about the idea that she is able and allowed to trust her own feelings and needs. In this improvisation she created some beautiful, harmonic melodic lines and used quite a lot of dynamic changes in her playing. Her first comment after improvisation was "oh, how beautifully I talked to myself". She said that it has always been difficult for her to receive positive feedback from other people and maybe it was so because she didn't accept herself as she is. After this improvisation she also said that she feels beautiful and good just the way she is.

5.7.5 Perception of emotions through depressed lenses

Finally I want to give attention to one more implication from this study related to perception and preferences of emotions by depressed patients. In sub-studies 1 and 2 it was found that depression affects a person's perception and preferences of emotional qualities of music. This is something that we should keep in mind while doing clinical music therapy work with depressed patients. Our perception of music as therapists can be different from that of our clients. This knowledge could be used also as a clinical tool for evaluating the progression of the therapy process. By using a modified and simplified version of the behav-

ioural task we used in sub-studies 1 and 2 it might be possible also to evaluate depressed clients' therapy processes based on musical perception.

This research has demonstrated that music therapy can offer a possibility for depressed patients to learn safe and playful ways to express their suppressed emotions, like anger, through creative musical expression. Interactive emotion regulation by a music therapist will gradually help the depressed patients to learn to use more beneficial emotion regulation strategies such as reappraisal and self-disclosure. When they are able to implement these new learned strategies in their daily life, it will lead to better general functioning and quality of life like one participant described in her feedback from the therapy process.

> *"I felt that I benefited a lot from my music therapy process. I learnt new ways to react and behave in different situations by understanding my own and other people's behaviour better. It was surprising for me that improvisation enabled me to express difficult emotions like anger. Improvisations bring up new things and ideas, which were processed further in verbal discussions with the therapist." Participant*

YHTEENVETO

Masennus on erittäin yleinen sairaus, joka vaikuttaa ihmisen elämään laaja-alaisesti mm. heikentää yksilön sosiaalisia taitoja ja vaikuttaa kykyyn tunnistaa ja ilmaista tunteita. Tässä tutkimuksessa selvitettiin masennuksen vaikutusta musiikin emotionaalisten piirteiden havaitsemiseen ja pitämisarvioihin sekä improvisaatioon perustuvan yksilömusiikkiterapian vaikuttavuutta masennuksen hoidossa. Päätutkimus oli satunnaistettu, kontrolloitu tutkimus, jossa vertailtiin musiikkiterapian ja standardihoidon yhdistelmän vaikuttavuutta pelkän standardihoidon vaikuttavuuteen työikäisten masennuspotilaiden hoidossa. Kahdessa osatutkimuksessa verrattiin masentuneiden ja ei-masentuneiden välisiä eroja musiikillisten tunteiden havaitsemisessa ja pitämisarvioissa. Päätutkimuksessa masentuneet koehenkilöt (n=79) satunnaistettiin koe- ja kontrolliryhmiin. Koeryhmään kuuluvat saivat standardihoidon lisäksi yksilömusiikkiterapiaa (20 istuntoa, 2 kertaa viikossa). Psykiatriset arviot toteutettiin lähtötilanteessa ennen satunnaistamista, sekä 3 kuukauden (musiikkiterapiaintervention jälkeen) ja 6 kuukauden kuluttua uudestaan. Masennuksen vaikutusta musiikillisten emootioiden havaitsemiseen tutkittiin itsearviointitehtävän kautta, jossa masentuneet koehenkilöt (n=79) ja ei-masentuneiden kontrolliryhmä (n=30) arvioivat 30 musiikkiesimerkkiä. Musiikkiesimerkit edustivat viittä perustunnetta (viha, pelko, suru, ilo ja hellyys) ja koehenkilöt arvioivat jokaisesta esimerkistä jokaisen viiden tunteen esiintyvyyttä. Masennuksen vaikutusta musiikillisten emootioiden pitämisarvioihin tutkittiin itsearviointitehtävän avulla, jossa masentuneet koehenkilöt ja ei-masentuneiden kontrolliryhmä arvioivat 30 perustunteita (viha, suru jai lo) ilmaisevaa musiikkiesimerkkiä ja kolmekymmentä 2-dimensiomallille (miellyttävyys ja energiataso) sijoittuvaa musiikkiesimerkkiä. Tutkimus osoitti, että musiikkiterapian ja standardihoidon yhdistelmä sai aikaan parempia tuloksia intervention jälkeisessä seurannassa masennusoireiden ja ahdistusoireiden vähenemisessä ja yleisen toimintakyvyn lisääntymisessä kuin pelkkä standardihoito. Hoitovaste (50% tai sitä suurempi oireiden väheneminen) oli merkittävästi parempi musiikkiterapiaa saaneiden ryhmässä. Osatutkimus 1:ssä masentuneilla koehenkilöillä tuli esiin selkeä negatiivinen painotus itsearviointiskaalojen käytössä verrattuna ei-masentuneiden ryhmään. Osatutkimus 2:ssa tuloksena oli, että masentuneet potilaat pitivät merkittävästi vähemmän korkea-energisestä ja vihaisesta musiikista. Yksilömusiikkiterapia yhdistettynä standardihoitoon on tehokas hoitoyhdistelmä työikäisten masennuspotilaisden hoidossa. Masennuspotilaiden negatiivinen painotus musiikillisten tunteiden havaitsemisessa antaa viitteitä siitä, että sitä voisi käyttää myös diagnostisena työkaluna masennuksen arvioinnissa. Kokonaisuutena tutkimus toi uutta tietoa masennukseen liittyvistä tunteiden käsittelyyn ja säätelyyn liittyvistä ongelmista ja siitä, miten musiikkia ja musiikkiterapiaa voidaan hyödyntää näiden ongelmien hoidossa.

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ORIGINAL PAPERS

I

INDIVIDUAL MUSIC THERAPY FOR DEPRESSION: RANDOMISED CONTROLLED TRIAL

by

Jaakko Erkkilä, Marko Punkanen, Jörg Fachner, Esa Ala-Ruona, Inga Pöntiö, Mari Tervaniemi, Mauno Vanhala & Christian Gold 2011

The British Journal of Psychiatry, published online Apr 7, 2011, doi:10.1192/bjp.bp.110.085431

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The British Journal of Psychiatry published online Apr 7, 2011;
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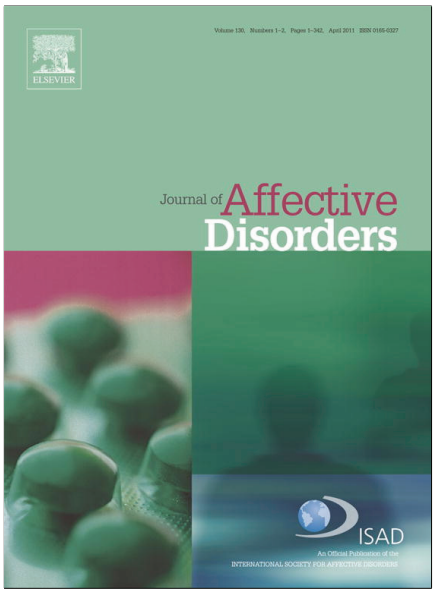
II

BIASED EMOTIONAL RECOGNITION IN DEPRESSION: PERCEPTION OF EMOTIONS IN MUSIC BY DEPRESSED PATIENTS

by

Marko Punkanen, Tuomas Eerola & Jaakko Erkkilä 2011

Journal of Affective Disorders 130 (2011) 118-126 doi:10.1016/j.jad.2010.10.034



III

BIASED EMOTIONAL PREFERENCES IN DEPRESSION: DECREASED LIKING OF ANGRY AND ENERGETIC MUSIC BY DEPRESSED PATIENTS

by

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Music and Medicine, published online 13 January 2011,
doi:10.1177/1943862110395597

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Marko Punkanen, Tuomas Eerola and Jaakko Erkkilä

Music and Medicine published online 13 January 2011
DOI: 10.1177/1943862110395597

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