MY EMOTIONS EXPRESSED BY MUSIC

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Improvisational psychodynamic music therapy (IPMT) has been demonstrated by Erkkilä et al. (2011) to be effective in the treatment for people suffering from depression. For the purpose of a mixed methods research design all musical improvisations have been captured electronically, the therapist's notes have been standardized, and the sessions have been recorded and saved. Furthermore, the research team of the university of Jyväskylä has developed a computational analysis software, called Music Therapy Toolbox (MTTB). The purpose of this master's thesis was to investigate two improvisations from one case in-depth, through the use of the MTTB software. The findings are presented, as well as the analysis process. The main outcome produced 10 descriptive codes that are useful for analyzing MTTB graphs. The discussion has been presented in a separate chapter, connecting various theoretical concepts and principles from IPMT to the current data and findings. Theoretical topics of interest were; emotional content, depression and the expression of anger, symbolic meaning, severity of depression, emotion regulation and rumination, musical communication and the therapeutic relationship, and the limitations and advantages of microanalysis and MTTB.

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Master's Thesis

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JYVÄSKYLÄN YLIOPISTO

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What are the characteristics of the musical structures in the improvisations representing 'the expression of anger' from two sessions of on case in the study by Erkkilä et al. (2011), receiving the intervention improvisational psychodynamic music therapy?

A case study

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ABSTRACT

Improvisational psychodynamic music therapy (IPMT) has been demonstrated by Erkkilä et al. (2011) to be effective in the treatment for people suffering from depression. For the purpose of a mixed methods research design all musical improvisations have been captured electronically, the therapist's notes have been standardized, and the sessions have been recorded and saved. Furthermore, the research team of the university of Jyväskylä has developed a computational analysis software, called Music Therapy Toolbox (MTTB). The purpose of this master's thesis was to investigate two improvisations from one case in-depth, through the use of the MTTB software. The findings are presented, as well as the analysis process. The main outcome produced 10 descriptive codes that are useful for analyzing MTTB graphs. The discussion has been presented in a separate chapter, connecting various theoretical concepts and principles from IPMT to the current data and findings. Theoretical topics of interest were; emotional content, depression and the expression of anger, symbolic meaning, severity of depression, emotion regulation and rumination, musical communication and the therapeutic relationship, and the limitations and advantages of microanalysis and MTTB.

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1   INTRODUCTION

Regulating and communicating emotions are examples of essential skills that are necessary for maintaining a good quality of life. Human beings express different emotions every day and there are many ways to do it. However, not all emotional expressions have equal communicative powers. It appears that a great deal of communication is going through non-verbal channels, like body language and voice prosody. These aspects of communication are widely applied in the case of art expression. For instance it goes without saying that music has an unquestionable power to move us emotionally. Moreover, music is employed by all kinds of health workers, promoting the quality of the life of patients, but perhaps most profoundly by music therapists; trained experts in the field of the therapeutic benefits of music in all kinds of forms.

Music therapists working with adults suffering from depression are helping preventing, diagnosing and/or treating the depression. The expert opinion supports music therapy being a suitable form of treatment for adults suffering from depression, but the history of research on music therapy is only short. However, Zeldow (2009) stated very well that health professionals "will always have to deal with uncertainty and uniqueness as they respond during therapy sessions in a moment-to-moment way, and will have to rely on not only empirical research but also their clinical judgment and values" (2009, in Messer and Gurman, 2011, p. 23). This thesis contributes to the body of knowledge by presenting a qualitative case-study that investigates moment-by-moment experienced changes in a clinical improvisation derived from a randomized controlled trial (RCT) by Erkkilä et al. (2011) that confirms the positive effect of improvisational psychodynamic music therapy in the treatment of depression.

The music therapists in this RCT are trained to investigate and recognize roles and meanings of music in close relationship with the client and actively attune their own playing to support the process. For instance, Bruscia (1987) described sixty-four techniques, for the music therapist to use in improvisational music therapy (in Wigram, 2004, p. 34). Music therapists also advocate the effect of music itself. However, the role and meaning of the improvised music of both the therapist and the client haven't been researched sufficient. Therefore, music therapists have to rest their case based on the descriptions of the founders of music therapy in

theory, when speaking of the application of potential therapeutic and musical interventions, embedded in a therapeutic context. In order to decipher the role and meaning of specific musically expressed emotions as described in complex music psychotherapy sessions by Erkillä et al. (2011), this study will analyze a therapeutic musical improvisation, while keeping the balance between exploring and structuring the data. The specific therapist treating the client elaborated in his notes about the emotional and symbolic content of the improvisation.

Chapter 2 presents the body of knowledge in a literature review regarding depression, treatment methods, music psychology and the role of expressing anger. Specifically, music therapy and the meaning and roles of (improvisational) music in music therapy will be elaborated upon. Chapter 3 introduces improvisational psychodynamic music therapy (IPMT). Chapter 4 is introduced through the presentation of the research questions of this study in concrete terms. Following is the relevant knowledge regarding the methodology and structure of this study, concluding with a brief theoretical framework. The results of the present study are presented in chapter 5. First the description of the process of the analysis of the data has been presented and general information about the case. After that the data has been presented in segments, in order to answer the research questions. The discussion and conclusions of this thesis will be presented in a separate chapter 6. Additional recommendations for future research have been pointed out throughout the text.

2   DEPRESSION

"Depression is a sneak thief, slipping into a life gradually and robbing it of meaning, one loss at a time." (Ainsworth, 2000, p. 3).

2.1 Definition and co-morbidity

Depression refers to a broad range of conditions. Therefore, it can be wise to consult a tool like the DSM-IV-TR to have an overview of symptoms that are related to the term depression when thinking in diagnostic terms. The symptoms entail "sadness, loss of interest or pleasure, feelings of guilt, low self-worth, disturbed sleep or appetite, feelings of tiredness and poor concentration" (WHO, 2014). Like most diagnoses, depression is dependent on the severity of the symptoms as well as the duration of the episode. The fact that the symptoms only have to be present, regardless of the order or the importance makes the label suitable for various conditions (Gotlib et al., 2008, p. 70). Also the severity of the depression can be measured and is mostly translated into one of the three categories; mild, moderate or severe. Moreover, depression is divided into subcategories; like cyclical, seasonal and clinical depression. Just like the recovery, the onset of depression is also a process.

Depression is closely related to and co-morbid with other illnesses. For example, some of the symptoms of the major depressive episode diagnose are overlapping the symptoms listed for the Anxiety disorder. Haddad and Grunn (2011) explain that depression and anxiety are only seen as separate states of being since half of the 19th century and they reported in 2011 that,

"in the NCS-R, people who had met lifetime criteria for Major Depression were more likely to also meet the lifetime criteria for an anxiety disorder than any other mental disorder – 59.2% showed this type of comorbidity" (Haddad and Grunn, 2011, p. 35).

Dystymic disorder is a milder form of depression (Ainsworth, 2000, p. 48) and related to depression in terms of being a possible predictor for the onset of a major depressive episode (Haddad and Grunn, 2011, p. 35). Likewise, depression belongs to the category of mood disorders along with the far less common diagnosis bipolar disorder I and bipolar disorder II.

2.2   Assessment

Correct identification of the depression is crucial as a starting point for treatment. To assess depression there are over 280 measures available and the assessments are mostly carried out by either general practitioners or specialized clinicians. The measures include the clinician's ratings as well as self report inventories. Measures that are widely used and well known are the Beck depression inventory (BDI), developed as a self report inventory and published in 1961 (Gotlib and Hammen, 2008, p. 49) and the Hamilton rating scale for depression (HAMD). The HAMD was developed to measure the severity of the depression in already diagnosed depressed clients (Gotlib and Hammen, 2008, p. 45). Other measures that were developed are the MADRS and HADS. MADRS refers to Montgomery-Åsberg depression rating scale, which was developed to be sensitive to changes in de depressives state in 1979 by Montgomery and Åsberg (1979). HADS refers to the Hospital, anxiety and depression scale and was initially developed by Zigmond and Snaith (1983, in Power, 2013, p. 404). In a review, Herrmann (1997) concludes that the natural course of depression, as well as changes due to responses to psychotherapeutic and pharmacological treatments are to be detected by the HADS.

2.3 Prevalence and cause

Psychoanalyst D. Leader (2009) states that depression is found everywhere nowadays. Moreover, during the course of history depression was already explained in the theoretical constructs known at that time. For example the ancient Greeks wrote detailed descriptions of an illness they called "Melancholia" which is as a description comparable to our modern concept of the dystymic disorder.

Depression affects around 350 million people globally (WHO, 2012) and one in five people is likely to develop a depression in the course of their lifespan. The field of research on depression grew exponentially the last decades and the prevalence is mapped in more and more countries in the world. One may conclude that depression is a highly prevalent disorder in the world. Furthermore, a higher prevalence is found in women (WHO, 2014; Power, 2013, p. 17; Haddad and Grunn, 2011, p. 32; Hussain, 2010, p. vii; Ainsworth, 2000, p. 3;). Explanations for depression can be sought in genetic, behavioural and socioeconomic

environmental fields. Though, in all of these fields no specific causal relationships have been identified.

2.4   Vulnerability, anger and emotion regulation

2.4.1 An example of vulnerability

The knowledge concerning evident predictors of depression is closely connected to the statistics regarding the prevalence of depression. This so-called superficial knowledge applies, for example to the high prevalence of depression in women. Superficial because, apart from the prevalence there is no clear explanation. However, there are factors that might contribute to these statistics. Quadrio (in Hussain, 2010, p. 153) includes in her argument that the relationship between depression and the occurrence of trauma and abuse (in the past) of women is considerable. Therefore, it is likely to be an explanatory factor and the historical embedded social, political, economical status of females seem likely to be related. Quadrio mentions also psychological mechanisms, like internalizing and externalizing emotions in relation to acquired or learned behaviour. "As a generality females manifest more internalising behaviours and react with more fear and/or sadness where males manifest more externalising behaviours and react with more anger" (Quadrio, 2001, in Hussain, 2010, p. 157). However, the vulnerability for women regarding depression has not been investigated sufficiently.

2.4.2 Anger turns out- or inwards

The relationship between the expression of anger and depression has been discussed for decades by both clinicians and researchers. Novaco (1977) elaborated upon 'stress inoculation' as a cognitive approach to the treatment of clients suffering from chronic anger attacks. The treatment is as short as 6 – 10 sessions and the emotions are led back to deficits on all 'biopsychosocial' perspectives (moreover in chapter 2.5). In the cognitive theory, anger is viewed as a function of attributions, appraisals, expectations, and self-statements of specific external elicitations. From a somatic and emotional point of view, anger is fixed and intensified by anxiety, agitation and irritation. In the behavioural theory, both opposition and disengagement are associated with increased experiences of anger. Reports from psychodynamic theory on depression traditionally point towards anger turned inwards.

"The inhibition of aggressive drive toward the external world and the subsequent redirection toward the self of these inherent, destructive impulses have been construed as the antecedents of depression" (Freud, 1917/1963; Menninger, 1938; Storr, 1968, in Novaco, 1977, p. 600).

Novaco (1977) highlighted the connection between anger and aggression in depression. Researchers at that time rather found that anger in psychiatric patients was "*both* inwardly and outwardly directed" (Schless, Mendles, Kipperman, and Cochrane, 1974; Weissman, Klerman, and Paykel, 1971, in Novaco, 1977, p. 600).

2.4.3 Emotion regulation

Ehring et al. (2010), stated that "emotion dysregulation has long been thought to be a vulnerability factor for mood disorders" (Ehring, 2010, p. 563). He acknowledges that there have been only few empirical tests to this idea. In order to propose a conceptual framework for future research he refers to the 'Process model' that has been proposed by Gross and John (2003). The 'Process model' has been used by the researchers to investigate,

"whether attempts to cognitively regulate emotion relatively early in the emotion-generative process (e.g., reappraisal) are more effective than attempts to behaviorally regulate emotion relatively late in the emotion-generative process (e.g., suppression)" (Ehring et al., 2010, p. 563).

Particularly, this model connects the process of emotion regulation to the process of emotion creation. Gross and John (2003) performed 5 studies in order to prove their hypotheses. The results suggest different kinds of coping strategies for different kinds of emotions. Especially, suppression and reappraisal have been investigated in terms of effectiveness as coping strategies for one's own affect, in social situations and for well being in general. The main conclusion of this research yielded that suppression is associated negatively and reappraisal positively with positive affect, social skills and well being in general.

Returning back to Ehring (2010), who tested four hypotheses regarding three emotion regulation strategies for sadness as a function of the vulnerability for depression with a population existing of 73 currently non-depressed university students. The experimental group had suffered from a major depressive episode in the past. The hypotheses were generated and tested through rating emotion regulation strategies after watching a sadness inducing film. The first hypothesis predicted differences between the groups in traits regarding emotion regulation strategies; suppression, reappraisal and emotion acceptance. However, the groups did not differ between their ratings regarding the use of suppression and

reappraisal. The groups did differ in their scores for 'non-acceptance;' the participants in the experimental group had higher scores for 'non-acceptance' than the participants in the control group.

The second hypothesis predicted differences regarding spontaneous emotion regulation strategies. A significant difference between the groups was found for suppression, but not for reappraisal. The third and fourth hypotheses were based on the outcome of watching a second sadness inducing film. To guarantee homogeneous data a manipulation check was performed. The third hypothesis predicted differences between the groups for the emotional reactivity when being instructed with a specific emotion regulation strategy. However, the results did not reveal a significant difference between the experimental and the control group. The fourth hypothesis predicted differences between the emotion regulation strategies regarding the emotional reactivity. The outcome revealed that the group that was instructed with reappraisal experienced less negative emotions during the movie opposed to the group instructed with suppression, with a similar trend after having watched the movie.

The new hypothesis and recommendation as a therapeutic goal reads; the choice of emotion regulation strategy that would be appropriate to suit needs at a specific moment is more important than simply one technique over the other. Both groups appeared to be equally equipped when rating their effectiveness of use of functional strategies. However, the experimental group showed a spontaneous tendency towards using more dysfunctional emotion regulation strategies. Further research including currently depressed clients, a larger sample in general, a more exclusive selection regarding depression and a more inclusive data collection methodology was recommended.

2.5 Biopsychosocial model

I shortly introduce here the 'Biopsychosocial model' as a theoretical construct helpful for explaining and understanding the treatment of depression. The model integrates the biomedical and the psychosocial perspectives about mental disorders. The cause for depression is presented as a psychobiological concept including both vulnerability and protective factors. Mentioned are biogenetic, psychological, somatic, social and cultural risk

factors. They are to be taken into consideration alongside of the diagnostic process in terms of listing the symptoms. The model is an inclusive and suitable construct that embraces a variety of therapies.

2.5.1 Pharmacotherapy

Pharmacotherapy means essentially that medication is taken over a longer period of time in order to reduce the symptoms associated with a depression. There are numerous different types of pharmacotherapy. Allan, Topiwala, Ebmeier, Semple and Steele (in Power, 2013, p. 143) describe medication according to their chemical structure and mechanism of action. In general medication for depression can be subdivided into six categories. To mention, tricyclic antidepressants (TCA), monoamine oxidase inhibitors (MAOI), serotonin reuptake inhibitors (SSRI), serotonin and noradrenaline reuptake inhibitors (SNRI), noradrenaline reuptake inhibitors (NARI), and miscellaneous drugs. The technical discussion regarding the biochemical relationship between anti-depressants and the improvement of depression lies beyond the scope of this thesis.

To provide an insight on how medication is administered as somatic treatment for depression I will describe a typical process of treatment. When the medication is prescribed, the patient needs to take the pills structurally. The goals of the intake can be divided into three phases: acute (to alleviate symptoms), continuation (unknown, but assumed to prevent relapse) and maintenance (prevention new depression and/or relapse) (Gitlin in Gotlib and Hammen, 2008, p. 555). A clinician will consider a number of issues in the process of prescribing the medication. Gotlib (2008) describes the history of the past response related to neurotransmitter specificity, a family history of response related to the side effects profile, a depressive subtype related to blood level considerations, and costs related to safety and medical issues. The results of these considerations are then to be evaluated along the lines of the existing knowledge about different anti-depressants (Gotlib and Hammen, 2008, p. 554).

2.5.2 Complementary somatic treatments

There are also other forms of somatic treatments for depression, called complementary somatic treatments, because their efficacy has not (yet) been demonstrated sufficiently. Examples are St. John's Worth and omega-3 fatty acids. These are natural products which are

believed to be effective in relieving symptoms related to depression, according to the outcome of statistical research (Linde, Berner, Egger and Mulrow, 2005; Werneke, Horn and Taylor, 2004; Freeman et al., 2006; in Gotlib and Hammen, 2008, p. 568). Electroconvulsive therapy (ECT) is a treatment that has a long history and its ethical issues have been heavily debated upon. Until today it is only used to treat depression as a last resource (Gitlin, in Gotlib and Hammen, 2008, p. 568). 'Transcranial magnetic stimulation' (TMS) is a treatment similar to ECT. Two magnetic coils are placed over the scalp inducing a minor current, stimulating the local underlying cortex. The effects of TMS are considerably weak (Allan, Topiwala, Ebmeier, Semple and Steele, in Power, 2013, p. 157). 'Vagal nerve stimulation' (VNS) is a treatment similar to ECT and it is only used as a last resource. VNS entails a surgically placed, pulse-generating device in the chest of the patient. The device has a wire attached to the patients left vagus nerve and is operated externally. The effect of VNS on depressive symptoms is considered as weak (Gitlin, in Gotlib and Hammen, 2008, p. 569).

2.5.3 Psychotherapeutic treatments

In general, psychotherapy refers to inter-relational treatments that are based on psychological principles. There are many forms of psychotherapy, but I will only describe cognitive-behavioural therapy, interpersonal therapy, psychodynamic therapy and music therapy. Cognitive behavioural therapy (CBT) is a combination of cognitive therapy and behavioural therapy. In order to gain a better understanding I will elaborate on both therapies separately and I will give an example of a CBT approach to treat 'anger management problems' called 'stress inoculation therapy.' For the purpose of understanding the contents of this thesis better, I will also discuss psychodynamic therapy and music therapy.

CBT and interpersonal therapy appear to be the most researched as the subject of an RCT and were therefore labelled as evidence supported treatment (EST). EST's have been described as the most established forms of psychotherapy in a report by the American Psychological Association Presidential Task Force (APAPTF) (2006, in Messer, and Gurman, 2011, p. 22). In 2001 the Institute of Medicine defined Evidence Based Practice (EBP) as "the integration of research (the emphasis in EST's) with clinical expertise and patient values" (Institute of Medicine, 2001, in Messer and Gurman, 2011, p. 22). Moreover, the APAPTF (2006, in Messer, and Gurman, 2011, p. 22) elaborated in their report that in the light of EBP, the best

outcome is achieved by the psychologist when the treatment is started with examining the client and proceeded with what research evidence supports (included EST's). Messer and Gurman (2011) continue that EBP relates more to the treatments that emphasize the relationship between the therapist and client.

Behavioural psychotherapy

Antony and Roemer (in Messer and Gurman, 2011, p. 107) describe that behavioural therapy is dealing with unlearning problematic behavioural patterns and learning constructive coping strategies. Numerous techniques and strategies are described and they share some characteristics. Moreover, the emphasis of the treatment tends to be on direct change of the problem behaviour or eliciting, intensifying and sustaining factors related to the problem behaviour. Furthermore, the characteristics of the therapist include a directive attitude, modelling or demonstrating desired behaviour. Typically the therapist will promote and encourage learning new skills and changing old behaviours. The amount, length and setting of sessions are different when compared to other therapies. For example, a session can last the whole afternoon, but can cover the whole process for a specific problem.

Cognitive psychotherapy

Nowadays, the terms cognitive therapy and CBT have been exchangeable (Dienes, Torres-Harding, Reinecke, Freeman and Sauer, in Messer and Gurman, 2011, p. 143). The term cognitive therapy was first introduced in the 1950's. The foundation of cognitive therapy lies in psychological constructivism. Meaning, the principle that every individual develops subjective schemes about themselves and their interaction with the world. Subjective schemes are constructed from automatic thoughts, assumptions and beliefs. The focus of the therapy is therefore on thoughts and assumptions, but specifically on dysfunctional or destructive beliefs. In the 1970's the development increased, especially combining and integrating behavioural components. The present-day application of cognitive therapy has stretched its boundaries beyond the therapy, into the general care. Techniques have been adopted by therapists with other theoretical backgrounds. Concurrent, there has been created space for the acknowledgement of the importance of the therapeutic relationship within cognitive therapy.

'Stress inoculation:' a cognitive behavioural approach to anger management

This treatment protocol has been developed initially to address anxiety and pain issues. Moreover, Foa et al. (1999) investigated stress inoculation treatment both opposed to and in combination with exposure therapy for the treatment of the reduction of the severity of PTSD, depressive and anxiety symptoms. Both methods had significant positive results, but exposure therapy appeared to be the superior treatment methodology with a reasonable probability due to a lower drop-out rate described to a higher amount of non-working participants. Moreover, the clinicians in this study were non experts. This mostly impaired the stress inoculation method which includes multiple phases where the therapist has to 'entrain' the client, opposed to the les complex exposure therapy method.

Stress inoculation is included in this thesis, because it clarifies different aspects of an effective anger management method and the relation between anger and depression in a therapeutic context. Stress inoculation consists of getting familiar with cognitive, behavioural and emotional coping skills and a scheme of the stressors for anger (Novaco, 1977, p. 194). The latter, to be able to encounter the stressors in an appropriate dose. The contact time approaches 6 – 10 sessions. The treatment is divided into three phases. The first phase includes an educational, cognitive preparation regarding the topic of anger. Emotions are led back to deficits on all 'biopsychosocial' perspectives in six topics.

The second phase teaches the client three sets of skills by familiarization, modelling and rehearsal. Regarding the cognitive perspective, the client learns to view the situation from different perspectives, recognise irrational beliefs and learns empathic, role-taking skills. Regarding the affective/biological perspective, the client learns relaxation skills (muscle relaxation and imagery) and is reassured to sustain a sense of humour. The relaxation trains the physical awareness process that is needed to detect initial tensions and humour enables a person to react in a more dynamic way. The behavioural perspective builds on goals regarding communication of emotions, assertiveness and problem-solving behaviour.

> "The therapeutic procedure enables clients to recognize anger and its source in the environment and to then communicate that anger in a non-hostile form" (Novaco, 1977, p. 602).

The third phase of the treatment is called 'application practice.' The clients can test and illustrate their skilfulness through imagination and realistic role playing. The client is taught to use anger in such a way that the positive functions will be maximized and the negative minimized. Particularly 'energizing effects' are viewed as positive, because they enable a sense of control and they function as a 'cues' to manage a problematic situation.

Interpersonal therapy

Markowitz (in Power, 2013, p. 194) states that interpersonal therapy (IPT) is based on the attachment theory and the communication theory. In summary, in light of human beings connected to each other, this form of therapy refers to psychosocial and life event concepts that have been researched in relation to the diagnosis. For depression, a connection has been demonstrated for meaningful life changes, social isolation and bad marriage. The cause, development and prognosis of an illness is explained in it's environment and conversely similarly connected to it's cure. The efficacy of IPT has been demonstrated for different diagnostic groups and also for depression. The techniques are eclectic and focussed on supporting the client as a client suffering from a medical illness and enabling the client then to solve one of the related issues in their lives. IPT uses 'common factors' (Frank, 1971) as spear points, which are explained below. Furthermore, IPT focuses on the here-and-now and works on behaviour changes. There is not a clear structure, but the goals are always interpersonal and can be generally described as relating life events to mood and other symptoms.

Psychodynamic therapy

Mainly in the beginning of the 1970's psychodynamic therapy methods have been developed as short term treatment methods (Messer and Gurman, 2011, p. 396). The focus lies on the exploration of conscious and unconscious conflicts and how they are present in interpersonal relationships, including the relationship between the therapist and client. Psychodynamic therapy is a non-directional form of therapy. This means that the therapist typically supports and accepts all kinds of behaviour and thoughts of the client while identifying problems and setting goals together with the client. The goals focus on dysfunctional defences, blocked emotions and destructive relationship patterns. In relation to analytical therapy, which can take up years, this is a very brief form of therapy that is conducted in 10 – 30 sessions. In general, the sessions take place in an indoor space designed for therapeutic purposes.

Psychodynamic therapy is a form of psychotherapy that roots in psychoanalytic theory. Concepts like unconscious, resistance and (counter)transference are applied in the relatively short relationship focussed treatment. Following is a short explanation of the most important terminology. Beginning with 'unconscious.' This refers to the notion of the existence of different states of consciousness and the division of the mind into Id (unconscious and instinctual part), Ego (pre-conscious and organisational part) and Super Ego (conscious and moralizing, critical part). 'Resistance' refers to the act of blocking feelings out of the conscious realm and 'transference' refers to the unconscious directing of feelings onto something or someone. Leiper and Maltby (2004) explain transference as;

> "perceptions, thoughts, feelings and actions that are repeated (…), unselective and undiscriminating; inappropriate, tending to ignore, distort or actively transform aspects of reality (…); irrational, idiosyncratic, contrary to normal perception, emotionally charged and fantasy laden" (Leiper and Maltby, 2004, p. 71).

Furthermore, 'counter-transference,' refers to the feelings of the therapist. Undoubtedly, psychodynamic therapy "is a process of real emotional engagement for both parties" (Leiper and Maltby, 2004, p. 71). The basic attitude of the therapist is illustrated in the image of a 'blank screen' that is meant for the free expression of the client. The therapist is supposed to portrait an anonymous person that is neutral in the interaction with the client and enables the manifestation of the internal, dynamic conflicts in the most purest form possible. However, the 'blank screen' is recognised as an ideal situation, but never to be achieved. 'Countertransference' rather develops, which refers to the therapists' own emotional problems and the undeniable truth that can be explained in opposed concepts. First as the development of feelings that form the most important obstruction in the progress of a therapy process. Second, as the development of feelings, which form the most important tool in the arsenal of the therapist and access to otherwise unconscious, disregarded material. The oppositional explanation derives from the initial explanation of '(counter)transference' by Freud. Since the 1950's recognition has arisen regarding the usefulness of the concept and its contribution to therapeutic change.

Leiper and Maltby (2004) describe different types of countertransference. 'Concordant countertransference' refers to the identification of the therapist with the client. 'Complementary countertransference' refers to the identification of the therapist with the 'other' who possesses and complements specific characteristics of the client. The latter is

explained through the 'Kleinian concept of projective identification,' which refers to a sort of unconscious communication from the client to the therapist. The task of the therapist is to 'contain' these messages and experience them. The messages are seen as an 'un-bearable self state' and sharing them, through all levels of consciousness will eventually help the client manage them. After having received them through an open and accepting attitude, the therapist can attempt to symbolise and communicate them back to the client. Leiper and Maltby (2004) explain that by understanding this kind of unconscious communication as

> "a form of empathic connection in which the client influences – even coerces – the therapists' inner life for purposes which are both defensive and communicative has been a vital advance in the subtlety and flexibility of the psychodynamic therapy" (Leiper and Maltby, 2004, p. 80).

Similarly to the 'blank screen,' not all the feelings of the therapist refer to unconscious communication coming from the client. Training and experience are therefore the strongest suit of a psychotherapist sailing with psychodynamic theory. Moreover, the personal experience of the therapist's own vulnerabilities are noticed by the client and in proper sequence replied. Thus, there is both conscious and unconscious communication and in both directions. From the professional point of view of the therapist communication means; Being available in order to be used in the attempts of the client to experience, but to make something different happen as a conclusion.

Music therapy

The practice of music therapy has been established in the 1950's. In theory it was based on notions of healing properties of music in ancient writings. In the Bible is written that David plays the harp to make King Saul feel better. "23 And whenever the harmful spirit from God was upon Saul, David took the lyre and played it with his hand. So Saul was refreshed and was well, and the harmful spirit departed from him" (The Holy Bible: English Standard Version, 2001). Plato referred to (Mixo)Lydian modes as encouraging indolence or sadness in the principle that music has a direct effect on the mood, character and health (Plato, in Bonde et al., 2002, p. 27). Contemporary music therapy bases its practice on scientific thinking and empirical findings. The definition of music therapy is dependent on the target group and also on the psychological school that the therapist bases itself on. For example Nordoff and Robbins (1959) first applied music embedded in client centered psychotherapy for autistic children. As music therapists are working in fields ranging from elderly health care facilities

to neonatal intensive-care units I am limiting the definition for music therapy here to 'music psychotherapy' which is applied in the treatment of mental disorders.

The goals for music psychotherapy are linked to the symptoms or problems the client brings to the therapy. Regarding the treatment of depression, there have been different music therapy methods and techniques described that focus on different goals. For example the method can be supportive, focused on the relaxation and the activation of the client. Re-education can be a part of the therapy by working towards interaction and expression. Like mentioned earlier, the explanation strongly depends on the psychological theoretical background. It regards the basic attitude of the therapist, what the most important in-therapy experiences could be to the client, and what the most important elements are within the relationship or techniques used and handed to the client.

In cognitive music psychotherapy the therapist's attitude can be directive and music could be used as a motivating stimulus to focus on the environment and also to enhance the reflective abilities. Maranto (in Luce, 2001; in Laansma and Riemke; in Smeijsters, 2006, p. 174) proposed the use of cognitive techniques in active music therapy in a 'cognitive music psychotherapy' model that focuses on the exploration, expression and changing cognitions and emotions. An additional example of an active method is the music therapy protocol that uses improvisations, music listening, and visualization, while using cognitive techniques. The therapist models mental and emotive imagery in order to recognize and decrease stress symptoms, to increase decision making skills, and to re-education regarding flawed attributions. An example of a receptive method is based on the principle of mood induction through music has been described on the occasion of an investigation of the emotional content in music and the prevalence of 'value ranges' in depression by Smeijsters, Wijzenbeek and Van Nieuwenhuijzen (1995a, in Smeijsters 2006, p. 173).

Frohnne-Hagemann (2001b; in Smeijsters, 2006, p. 174) elucidated 'integrative music therapy.' The focus lies on the therapeutic relationship, like in PMT, but the relationship 'in the here and now' is accentuated. The goals focus on the symptoms related to depression, like the disability to experience positive emotions and social isolation. Insecurity is viewed as the predominant manifestation of an early developmental identity dysfunction. Corrective

experiences in music therapy help to construct new attributions and realities. Empathy (similar to client centered therapy) is stressed as a foundation for the practice situation.

In psychodynamic music therapy (PMT) the therapist is typically non-directive. Themes that arise and have been recognized as the cause of the depression are then to be symbolized and worked through on a (un)conscious level. (Davies, 1995, Odell-Miller, 2002, Moe, 2002; in Laansma and Riemke; in Smeijsters, 2006, p. 175). Music is seen as a suitable medium for uncovering unconscious feelings and as a focus for transference. Mary Priestly (1994) and Kenneth E. Bruscia are important pioneers of PMT, which roots in psychoanalytic theory and follows similar structures as psychodynamic psychotherapy (moreover in chapter 3). Guided imagery and music (GIM) is described by Pavlicevic (2003; in Smeijsters, 2006, p. 173) as a receptive technique and it follows the principles of PMT. This technique, where the client typically listens to selected music, allows deep relaxation. After that disclosure through reflection regarding images, dreams and memories from the client's personal history through reflective musicianship, drawing and verbal reflection. The music works as an intensifier and tinges the memories of depressed clients who commonly only stiffly experience general and flat mental objects. Through this experience new meanings can be formulated and new attributions can be formed.

Differences between music psychotherapies can be explained also through examining the role and meaning of music. The importance and space that music takes differs, from music *as* psychotherapy, to music *in* psychotherapy, to psychotherapy with musical *support*. However, within one type of psychotherapy the role and function can also change. music can be used as a 'receptive' or 'active' technique and the application should always have a goal. Illustrations of 'receptive' techniques are ranging from purely listening (sometimes not even to music, but to the surroundings) to actively discussing the supposed content of random, pre-selected, preferred and music derived from scientific investigation). The 'active' techniques involve principles enabling the production of sounds together with the client, which are believed to relate closely to the inner world of the client and use music as a 'changing agent' to make changes in the experience of the client on a nonverbal and also unconscious level. Another function of music is the interaction and contact that is almost inevitable when playing instruments together. Pre-composed music and songwriting can be used to structure and shape

the experience of the client. Improvisation is a generally known phenomenon. It is widely used to establish contact and work through the 'relational', 'symbolic,' and 'communicational' aspects that are important for the therapy (moreover in chapter 3.6.3).

Undertakings explaining the potential role and meaning of music in music psychotherapy produced different theories over the years. These theories are mostly based on the expert opinion and on psychological theories as a reference and a framework. For example in the Psycho-dynamic music therapy tradition, music is described as a tool for containing. "(…) Containing is often the most useful function we have to offer" (Sobey and Woodcock in Cattanach, 1999, p. 146). Music is also described as an expression. "Music is always an expression of some kind, but sometimes it is the expression of a defense against an unacceptable feeling or impulse." (Priestley, 1994, p. 136). Another example derives from a paper regarding behavioral music therapy. It reads, "music is used in a number of ways; as a cue, as a time structure and body movement structure, as a focus of attention, as a reward" (Madsen, 1968, p. 16). In general can be said that music serves the purpose of evoking, supporting and expressing the therapeutic process, fulfills different roles and can carries many meanings.

2.6   Research on effective elements in therapies

In general the research tradition has pointed out the struggle for both ascendancy and collaboration.

> "(…) brief forms of cognitive therapy, behavior therapy, psychodynamic therapy, and interpersonal therapy have all been shown to do as well as medication in alleviating depression, without side effects or the loss of empowerment that the former may entail (Cuijpers, van Straten, Andersson, and van Oppen, 2008; Hollon, Thase, and Markowitz, 2002). A recent meta-analysis concluded that it is only for the most severe depressive symptoms that antidepressant medication produces better results than placebo (Fournier et al., 2010). Some research indicates that there is an advantage to combining psychotherapy and medication in the treatment of depression, both regarding outcomes (de Jonghe, Kool, van Aalst, Dekker, and Peen, 2001) and in enhancing remission rates for chronic depression (Manber et al., 2008)." (Messer and Gurman, 2011, p. 14)

In this chapter I am mainly moving forward to subjects, which closely relate to the relationship between the client, therapist and the significant results of therapy.

2.6.1 Belief system and expectations

Without going into detail regarding the research on the biochemical working of anti-depressants, the effects have been demonstrated as there has been done a great deal of research on the efficacy of medication. The working of this somatic treatment deserves a little more explanation. As I have described before, administering medication entails more then fetching the prescription at the pharmacy. Similarly, in order to test the efficacy of a medicine, the research entails more than only serving the drug. Particularly, control groups have been employed as part of the research and interestingly, the control groups tend to improve as well. Research trials that investigate medication treat the control group typically with a placebo treatment. The effects of these pills and other somatic placebo treatments have been investigated as well. Generally, the working of all somatic and psychological treatments are partly explained by placebo responses. For example, in a study that analyzes the data of 112 patients and 9 psychiatrists by McKay et al. (2006) it was concluded that the difference between the treatment through clinical management with a placebo opposed to 'Imiphramine' (trycyclic anti-depressant) was caused by the psychiatrist. Namely, the psychiatrists that produced a relatively higher positive outcome with the treatment of Imiphramine were the same doctors that produced a relatively higher positive outcome with the treatment through placebo's. Thus the effect can be thought of as a result of the therapeutic relationship between doctor and patient as well as the belief and expectations of the patient regarding the medicine and doctor.

There has been done a reasonable amount of research on the belief system and expectations of the patient in the medical context. These investigations are often describing the effects of placebo treatment as a control condition. In these studies, the results are associated with the assumption regarding the qualities of the phenomenon, event or related ideas or objects. However, these studies do not provide enough evidence to be able to state that the effect is caused by the belief system and expectations. For example, the effect of belief system and expectation on an illness is also related to the nature of the illness. The effect on a disorder like depression or Anxiety is thought to be large. Furthermore, different types of placebo treatments convey different effects. Goetz et al. (2008) describes larger improvements in Parkinson patients receiving placebo surgery opposed to placebo medication. Vice versa,

placebo treatment seems to induce both physiological and psychological effects. However, it remains unknown what the mechanisms behind placebo effects are.

Helpful as the placebo effect can be, it can also appear as a negative effect. This is called the 'nocebo effect.' Kirsch (2010) proposes the effect of the belief system and expectation on the onset and progress of the depression as a 'nocebo effect.' Namely, the way how we view the disorder and the expectations that derive from there could be very important to the prognosis of the depression. Moreover, Laansma and Riemke (2006) also point to uncovering 'attributions' in psychotherapy. The attributions that people assume to be related to their depression appear to be successful predictors for a positive outcome of the therapy (Haugen and Lund, 2002, Seligman; in Segal, Williams and Teasdale, 2004; in Laansma and Riemke; in Smeijsters, 2006, p. 174).

2.6.2 Therapeutic relationship and 'common factors'

In general, psychotherapy research revealed that treated clients are better off than 80 percent of non treated persons. No large differences have been found between studies that regarded relating the efficacy of the therapy to the techniques being used. The strongest correlations have been found between the positive results and the aspects characterizing the therapeutic relationship, especially when client ratings have been used. Moreover, characteristics of the therapists that are associated with a higher outcome are listed as "understanding and accepting, empathic, warm and supportive" (Norcross, 2002, p. 26).

In the positivistic research paradigm the effects of psychotherapy should be investigated with a Randomised Controlled Trial (RCT) methodology. The results of an experimental group are opposed to a control group. However, for psychotherapy the placebo treatment it is not as straightforward administered as for medication and other somatic treatments. Namely, the idea of offering contact hours which do not contain "working mechanisms," is viewed as unachievable. In essence, the outcome of a RCT regarding psychotherapy is still viewed upon differently than the outcome of a medical trial. Moreover, the outcome of psychotherapy research is often measured with a psychological measures, through the use of self report scales or questionnaires. Nowadays, it has become increasingly occurring for psychotherapy trials to also adopt physiological measures, like heartbeat rate, skin heat, blood samples and

EEG scans. Physiological measures observe data that come ultimately close to the event, but it still does not account for the lack of a 'placebo' condition for the control group.

Continuing to improve the methodology of psychotherapy trials, interesting questions therefore remain. What is the importance and amount of general aspects? For instance, much has been written the belief system and expectations of the client regarding the therapist and the therapy. Noticeably, in a different way than related to in medical trials. Norcross (2002) described the belief system and expectations of the client being a very important aspect of the treatment and partly accountable as psychological mechanisms of change. However, Norcross (2002) also states that "correlation research cannot lead to causal conclusions that client expectancies influence the outcome of psychotherapy" (Norcross, 2002, p. 348).

Frank (1971) described the 'Common factor theory.' The following 'common factors' as recognised;

- building a therapeutic alliance   - support   - success experiences

- helping the client to feel understood   - encouragement   - treatment rituals

- designing a rationale for improvement

The psychotherapies that had demonstrated their efficacy all shared these elements. Norcross (2002) elaborated on the working mechanisms in psychotherapy relative to each other and presented them related to the percent of improvement. The common factors appeared to be accountable of 30 percent of the improvement. Furthermore, 15 Percent was attributed to the expectancy of a good outcome (placebo effect) and 15 percent to techniques that had been used by the therapist. The last 40 percent were attributed to extra therapeutic change. Norcross (2002) related almost all the working mechanisms as being connected and yielded for the therapeutic relationship being the central topic. He proposed interpersonal style, attributes, empathy, warmth, positive regard, therapeutic alliance and working endeavour as overlapping and interdependent variables.

2.6.3 Music therapy and the benefits of music

The history of research related to specifically music therapy is closely connected to music therapists writing down their own practice. Logically the qualitative research paradigm matches seamless as the aims are focused on explaining and exploring phenomena in the

therapy. In addition, for depression, there have been some quantitative studies as well. The purpose may be clear; being able to generalize the effects of music therapy. In such manner, the effect of music therapy has been associated with a positive treatment recommendation for depression.

In a review by Maratos et al. (2008) four RCT's (Hanser, 1994; Chen, 1992; Zerhusen, 1995; Hendricks, 1999) and one CCT (Radulovic, 1999) were reviewed. Punkanen (2011) summarized and compared the different studies, which showed the diversity of the populations that were involved, methods being used and methodologies employed. A special asset, also mentioned in the conclusion of Maratos (2008), are the high levels of uptake, participation and the low drop out ratings by clients. However, the conclusion of Maratos (2008) yielded further research due to the poor quality of the methodology of the reviewed studies. Erkkilä et al. (2011) responded to this conclusion by designing a RCT and found as well a significant positive effect. Additionally, the RCT is part of a mixed method design. Regarding the RCT, the experimental group was offered improvisational psychodynamic music therapy and was compared with a control group who received standard care only (moreover in chapter 3.7).

Different types of approaches in music therapy have been found to be effective. The previous mentioned study by Erkkilä et al. (2011) focussed on psychodynamic oriented music therapy. Other studies focused on a cognitive approach. In cognitive therapy, mood is explained as being connected to thoughts. Moreover, Luce (2001; in Smeijsters, 2006, p. 178) concluded that the reflection on the meaning of music seemed to reduce the hyperactivity caused by cognitive schemes in depressed clients. This kind of explanation energized the discussion about the connection between music and the opinion of human beings about the emotional content of music. Besides, interesting is the presumed, intrinsic, expressiveness of music and the possibility of induction of emotions and possibly mood through the use of music.

There is great diversity between research methodologies researching music therapy. The following examples describe clear musical methods. Different receptive interventions have been employed and very different types of data has been collected with different methodology strategies. Fox et al. (1998) found that mood induction through reading self-referent

statements with the accompaniment of mood-congruent music followed by listening to cheerful music lead to a decrease of the depressive state. McKinney et al. (1997) found significant decreases in depression, fatigue, total mood disturbance and cortisol levels up to 6 weeks follow up, subsequent to a 13 week period of a 'Bonny Method of Guided Imaginary and music' intervention.

Music is an unique content and quality of music therapy. Music therapists view music as a 'healing' component in the therapy and music itself is also believed to have a positive effect on depression. A great number of studies is focusing on the (healing) effects of specificly music and this is very valuable for the practice of music therapists, because it contributes to an increased comprehension of the effects of music. For example, Lai (1999) related music listening to lower heart rates, respiratory rates, blood pressure and tranquil mood states in depressed women in Taiwan by employing a T-test. Field and Martinez (1997) found lowered cortisol levels in EEG scans for 14 depressed adolescents that were listening to music in 23-minute sessions, opposed to a control group that was asked to sit and relax their mind and muscles.

A number of the above mentioned studies connect music with specific symptoms that are related to depression. For example Luce (2001) researched the 'induction' of positive cognitive schemes through combined with music listening. Also the mentioned physical effects of music are appealing in light of the treatment of depression in the paradigm of the 'Biopsychosocial model.' It is difficult to successfully influence or investigate one relevant symptom. Therefore, it can be helpful to look at the prevalence and the cause. Quadrio (2010) proposed the relationship between the prevalence of depression and internalizing behaviour in women. The connection between anger and depression has been recognized several decades ago (moreover in chapter 2.4). Furthermore, Emotion regulation is a concept well known in the western health care and unofficially it has also reached the music therapy practice.

2.7 Research regarding the affect of music

2.7.1 Emotion regulation and depression

Emotion regulation and music

The intrinsic expressiveness of music has been investigated in the light of emotion regulation or affect regulation. Van Goethem (2011) analysed that there was little knowledge available about how affect regulation through music listening works and she proposed a theoretical framework through which the different goals, techniques, functions and mechanisms of affect regulation can be researched. Furthermore, she describes the work of Scherer and Zentner (2001) as typically thorough regarding the working mechanisms of music as an affect regulation technique. They consider not only the musical structure as being responsible, but also the performance features, listeners features and contextual features. Van Goethem (2011) explains, with reference to Sloboda and Juslin (2001), that both intrinsic (musical features) as extrinsic (iconic or associative) sources of emotion are acknowledged. Moreover, Juslin listed seven specific underlying mechanisms in several publications (Juslin and Laukka, 2004; Juslin, 2009; Juslin and Västfjäll, 2008). To mention, brainstem reflexes, evaluative conditioning, emotional contagion, visual imagery, episodic memory, music expectancy, and arousal potential. However, all authors acknowledge that little to no research has been performed to provide evidence on these topics.

Van Goethem (2011) investigated how music regulates different 'affects' and how successful music listening is in two studies with healthy people. The methods entailed interviewing and collecting diaries from 44 and again 60 university related participants. She found positive results and overall, that music listening played a major role in creating happiness and relaxation in healthy people. Moreover, Van Goethem (2011) stated that

> "music overall is a successful regulation device with a range of underlying mechanisms helping different strategies" (Van Goethem, 2011, p. 208).

In study 1 interviews were conducted and it became clear that participants believed that the emotion, type, familiarity or content of the music can help with affect regulation. The answers indicated that music can create a feeling of being in another world and it can help create memories. Related subjects were extracted from the interviews as well, like the positive effect of music-related (e.g. dancing) and music-unrelated (e.g. exercising) activities. Music seemed

also to help in an indirect way. Namely, by inducing a positive emotion on short term, another actual regulation attempt could start. For example, in the case of feeling angry, relaxation through music could be essential in order to attempt the strategy 'to think rationally' about the situation.

In study 2, the success rate of music listening as an affect strategy was measured in comparison to other affect regulation strategies. There were no significant differences found in the success levels of different music listening, so all strategies were equally successful. However, 'music listening' as a tactic scored higher for the strategies 'relaxation,' 'distraction,' 'introspection' and 'rational thinking.' In general 'venting and 'active coping' appeared as the most successful strategies, followed by 'relaxation,' which differed significantly from 'distraction' and 'introspection' and with a trend from 'rational thinking.' After 'talking to friends/family,' 'music' was the second most used tactic for affect regulation.

There have been only a few other studies investigating emotion regulation and all reports of emotion regulation through music have employed a receptive method. For example, one of them investigated the role of music as a method for regulating mood. Eight adolescents were interviewed in-depth and they filled out follow-up forms after the interview. Thereby, Saarikallio and Erkkilä (2007) provided explanations about how and why adolescents use music so that it could benefit their emotional health. Moreover, mood regulation through music was described

> "as a process of satisfying personal mood-related goals through various musical activities" (Saarikallio and Erkkilä, 2007, p. 88). Only receptive music activities were referred in the paper. Music is used for "creating resources for well-being rather than preserving well-being in times of trouble" (Saarikallio and Erkkilä, 2007, p. 105).

Saarikallio and Erkkilä (2007) also stated that the line between promoting positive moods and improving negative moods is tenuous.

Emotion regulation, music and depression

Depressed adolescents were investigated in a study that investigated emotion regulation strategies, or coping styles. Miranda and Claes (2009) investigated if there are correlations

between depression levels of adolescents and their coping styles through music listening (emotion-oriented, problem-oriented and/or avoidance/disengagement). In this study 418 adolescents filled out self-report questionnaires in class and the depression levels were measured with the 21-item Beck depression inventory. The results differentiate girls and boys as the outcome of the questionnaire differs significantly. More specific, lower depression levels in girls correlate positively with a problem-oriented coping strategy. Higher depression levels in girls correlate positively with an avoidance/disengagement coping strategy. Contrastingly higher depression levels in boys correlate positively with an emotion-oriented coping strategy. Furthermore, listening to the music style 'metal' correlates positively to higher depression levels, but only in girls who socialize with more depressed peers.

Music listening has been demonstrated as a helpful strategy that improves relaxation and induces positive mood. However, this is true in the case of choosing and using music that promotes helpful emotion regulation strategies. More specifically, the research presented does not explain why people like to listen to sad music. Garrido (2009) explores in her review a possible predictor for selecting sad music. Specifically, her paper investigates 'rumination' as emotion dysregulation. Rumination is a concept described and related to depression by Nolen-Hoeksema (1991, in Garrido, 2009, p. 20). It refers to repetitively and passively thinking. Garrido explains that for example a depressed mood might lead to a poor cognitive decision process in terms of emotion regulation. Dillman, Carpentier and Brown et al. (2008, in Garrido, 2009, p. 20) found that depressed adolescents diagnosed with major depressive disorder did not often use media to improve their mood. Still, there has been given little attention to how health may affect the choice of media.

'Rumination' has to be seen apart from 'reflective, private self-attentiveness,' which has been described as a healthy and adaptive trait. For now, there appears to be no standardized way to measure rumination in people and there could be many reasons to why people like to listen, or play sad music.

2.7.2 Preference and depression

Music is disliked by most depressed clients and especially energizing and expressive music. Punkanen (2011) investigated the connection between emotional states and approach and

avoidance motivation to musical preferences. The ratings after listening to two sets of thirty 15-sec. long musical excerpts were analyzed. Moreover, different excerpts represented different positions on the scale between 'valence' and 'energetic arousal.'

Rentfrow and Gosling (2003) investigated 3,500 participants in six studies to ultimately describe four musical 'preference dimensions'; 'reflective and complex,' 'intense and rebellious,' 'upbeat and conventional,' and 'energetic and rhythmic.' The first study investigated ordinary participants' beliefs, regarding the importance of the effects of music in their everyday lives. The following three studies investigated the basic structure of the preferences. The results of the second, third and fourth study were translated into four 'preference dimensions' and through the chosen generation procedure they could be generalized across time, populations, method and geographical region.

TABLE 1. Patterns in different attributes per 'preference dimension,' described by Rentfrow and Gosling (2003).

	Reflective and complex	Intense and rebellious	Upbeat and conventional	Energetic and rhythmic
Positive emotion	√	-	Predominantly	Less positive
Negative emotion	√	Intense	-	Less negative
Complexity	Quite	Moderate	Simple	-
Energy	-	-	Moderate	Moderately
Rhythm	-	-	-	Emphasis
Tempo	Slower	Faster	Moderate	Moderate
Instruments	Mostly acoustic	Mostly electric	acoustic/electric	Electric
Singing	Little	Moderate	Moderate	Moderate

The fifth study correlated the music styles to psychological attributes. For this study the songs were selected according to 14 styles building on previous studies. The results reveal that each dimension is typified by particular patterns in the attributes, which is visual in table 1. Concerning the reliability, the researchers calculated that the attributes that were less literal and maybe metaphorical were similarly reliable as descriptive attributes. For the sense of clarity only the attributes were divided into the first four attributes in the table, emotion, complexity and energy. The last four attributes were the general attributes division that has been made as well. After this, the preferences dimensions were related to all inclusive sets of personality dimensions in a sixth and final study. Specifically, correlations have been computed for the results of personality, self view and cognitive ability. Additionally, there was no significant correlation observed between emotional stability, depression and self-esteem. Therefore, the authors suggest that emotional states do not have a strong effect on

musical preferences. However, as songs undeniably represent various emotional states, further research on the relationship between musical preferences and emotions is advised.

Regarding depression, questions became interesting regarding music being able to contain emotions and therefore having inductive powers (moreover in 2.7.2). Furthermore, the findings of the previous study suggested that further research was needed to uncover the possible relationship between emotional states and musical preferences. The following study tries to answer; to what extent would depression affect the emotional evaluation of music? Punkanen (2011) investigated the emotional perception of people suffering from depression through collecting self report assessments of the emotional qualities of music after having listened to 15 second excerpts derived from the study of Eerola and Vuoskoski (2011). A 9-point Likert scale (1 = 'none at all' and 9 = 'very much') was presented for 5 basic emotions (anger, fear, sadness, happiness and tenderness). The ratings revealed patterns of misinterpretation or confusion and especially for anger. Specifically, the ratings were high for sadness when tenderness was presented and the ratings were high for anger when fear and sadness were presented.

Returning back, the hypothesis of the study on musical preferences by Punkanen (2011) reads that depressed clients would produce significantly lower ratings for; 'negative valence,' 'positive valence,' 'high energetic arousal' and 'anger.' Both the experimental (depressed) group and the control (non-depressed) group were also presented with a control condition. In this case, the two groups were not supposed to differ. The excerpts were representing 'low energetic arousal,' 'negative emotion (sadness)' and 'positive emotion (happiness).' The last two excerpts were also representative of approach (happiness) and avoidance (sadness). The results of this study revealed for the 'valence' scale that there was no significant difference between both groups, although there was an observable trend corresponding with the hypothesis. The 'high energetic arousal' samples were rated significantly lower by the experimental group and there was no difference between the two groups for 'low energetic arousal.' The mean ratings for the samples for 'anger' revealed a significant difference, whereas the expected similarity appeared in the ratings for the samples representing 'positive emotion (happiness)' and 'negative emotion (sadness).'

2.7.3 Acoustic cues and emotional communication

Music listening in daily life

Music making by non-musicians is a common practice in music therapy and indeed not even all music therapists are trained musicians themselves. Besides the study by Erkkilä et al. (2011, 2014b, 2014c) there have not been studies systematically investigating the importance and meaning of the emotional expression and music played by non-musicians. The focus on music listening in daily life as a recent topic of interest. Juslin and Timmers (2010) state that expressing feelings and inducing emotions are main reasons why people say that music is of great importance. Naturally, one does not have to have musical training to appreciate music. Juslin and Laukka (2004) explained the results of the following study by means of the Lens model with the purpose of designing the shape of the perceptual intuition of individual listeners. Additionally, their investigation focused on the habits of music listeners in a naturalistic environment. In this questionnaire study by Juslin and Laukka (2004), 141 participants filled out a 38-item questionnaire individually. Several questions explored the opinion of participants on the expressiveness of music.

> "Playing expressively" is explained by the participants as "communicating emotions and/or messages" as well as "playing with feeling" (Juslin and Laukka, 2004, p. 227).

All participants reported that emotional expressivity is an important quality of music. In addition, an investigation by Juslin and Timmers (2010) discriminated between musicians and non-musicians, but mostly in music listening experiments.

Musical performance

For emotion regulation and musical preferences only music listening has been considered as experimental condition. Other attributions of music, like the expressive and the communicative character of music making have also been researched, but mostly in non-therapeutic or -clinical contexts. Juslin and Timmers (2010), who conduct research in the field of musical performances, underline the importance of studying musical communication of emotions by reviewing survey studies and conducting in-depth interviews with both performers and listeners. It appears that emotional communication by the performer is an important part of the musical performance. Juslin and Timmers (2010) found that,

> "when music performances are at their most powerful, they do not stray very far from the origin in terms of non-verbal communication of emotions" (Juslin and Timmers, 2010, p. 482).

In other words it is not the technical control, nor the used musical parameters that makes musical performances extraordinaire, but how close the expressed emotions lie to the 'real' communication of emotion.

Vocal expression and musical performance

Juslin and Laukka (2003) have systematically reviewed and correlated the results of the studies on the communication of emotions in the context of both vocal expression and musical performance. They found similarities in the precision between the two fields. First, the emotions communicated to listeners were similarly precise. Specifically, anger and sadness were most often accurately identified among all five basic emotions (anger, sadness, happiness, fear and tenderness). Second, there appeared to be specific patterns within each emotion, which have been explained as a "coding of the communicative process" (Juslin and Laukka, 2003, p. 801). The generation of the codes have been described by Juslin and Laukka (2003) in great detail. For vocal expression eleven and for musical performance ten descriptions have been condensed into four different cues, including pitch, intensity, temporal aspects and quality (vocal) or timbre (musical).

The findings reveal that differences regarding the regularity of the frequency, intensity and duration of the acoustic cues correspond with specific emotions. For example, the positive emotions are more regular than the negative emotions. For negative emotions, including sadness, fear and anger, more detailed investigation is advised. Furthermore, tone attack in musical performance, which also deserves further investigation, seemed to be fast for happiness and anger, but slow for sadness and tenderness. However, for voice related cues the occurrence was less obvious. The results for this phenomenon were derived from only three studies on 'voice onsets.'

A limitation found by the researchers was that the music instruments or speech assignment seemed to influence the results of the studies. Consequently, the researchers chose to focus on features that appeared as independently controlled, regardless of the material that was used. For example, 'pitch level' (or 'F0' for vocal acoustics) was a feature that seemed very similar

and correlated positively. Moreover, low pitch was related to sadness and high pitch to happiness for both groups. The preliminary suggestion of the researcher for anger and fear is high pitch. An explanation manifests in the new sub-division of the emotions into active (fear, anger, happiness) and passive (sadness and tenderness), but further investigation has been advised.

Acoustic cues and emotional expression

Additional data has been presented by the researchers regarding the vocal and musical cues separately. Six acoustic cues that were investigated in 104 studies on the acoustic cues in vocal expression. All cues that are mentioned hereafter regard tendencies, because they mostly have not been systematically investigated. Summative for vocal cues can be said that there were no clear tendencies for the emotions happiness, tenderness and fear. However,

> "for instance, there is fairly strong evidence that portrayals of sadness involved a large proportion of pauses, whereas portrayals of anger involved a small proportion of pauses" (Note that the former relationship has been considered as an acoustic correlate to depression; see Ellgring and Scherer, 1996, in Juslin and Laukka, p. 796)

TABLE 2. "Patterns of Acoustic Cues Used to Express Emotions Specifically in Music Performance Studies," adapted from Juslin and Laukka (2003, p. 800,801).

	Anger	**Fear**	**Happiness**	**Sadness**	**Tenderness**
Mean Articulation	Staccato 10[15]	Staccato 9[10]	Staccato 13[15]	Legato 14[14]	Legato 9[9]
St. Dev. Articulation	Medium 5[5]	Large 4[4]	Large 6[6]	Small 4[4]	Small 1[1]
Timing Variability	Medium 3[5]	Large 8[8]	Small 7[8]	- [7]	Large 1[1]
Duration contrasts	Sharp 5[5]	Sharp 2[2]	Sharp 3[5]	Soft 4[4]	Soft 5[5]
Singer's formant	High 1[1]	- [2]	High 1[1]	Low 2[2]	Low 1[1]

Note. Vibrato (magnitude/rate) has been left out. The first number refers to the amount of studies supporting this relation and the number in brackets to the total amount of studies included in the current study investigating this cue.

The patterns of different musical acoustic cues have been summed in table 2, representing the findings from 41 studies on musical performance. The five basic emotions are connected to six musical features. Articulation includes staccato (much silence between the notes) and legato (little silence between the notes) playing. The findings were rather constant and the only exception entailed guitar playing, which demonstrated opposite findings. Regarding the timing variability, fear was characterized by relatively the highest scores, followed by anger, sadness and tenderness and happiness. Moreover, sharp increases in 'duration contrasts'

between short and long notes should relate to anger and fear, opposed to sadness and tenderness.

TABLE 3. "Summary of Cross-Modal Patterns of Acoustic Cues for Discrete Emotions," adapted from Juslin and Laukka (2003, p. 802).

	Anger	Fear	Happiness	Sadness	Tenderness
Speech rate/Tempo	Fast	Fast	Fast	Slow	Slow
Voice intensity/Sound level	High	Low[1]	Med./High	Low	Low
Voice intensity/Sound level var.	Much	Much	-	Little	Little
High-frequency energy	Much	Little	Medium	Little	Little
F0/Pitch level	High	High	High	Low	Low
F0/Pitch variability	Much	Little	Much	Little	Little
F0/Pitch contour	Rising	Rising	Rising	Falling	Falling
Voice onset/Tone attacks	Fast	-	Fast	Slow	Slow
Micro-structure	Irregular	Very irreg.	Less regular	Irregular	Regular

1 Except panic fear

Table 3 summarizes the integrated modalities of all acoustic cues within 5 particular emotions. Not all acoustic cues of both speech and musical performance come forward equally strong. Moreover, the researchers found that 'speech rate/tempo,' 'voice intensity/sound level,' 'voice quality/timbre,' and 'F0/pitch' seem to have the most powerful effects on the listeners' ratings of emotional content (Juslin, 1997c, 2000; Juslin and Madison, 1999; Lieberman and Michaels, 1962; Scherer and Oshinsky, 1977; in Juslin and Laukka, 2003, p. 797). However, tempo seemed to become less important in musical performance when melody was part of the rating and similar statements can be made for vocal cues. In terms of direction of prediction (power of prediction has been left out), the results have been compared to those of Scherer (1986, in Juslin and Laukka, 2003, p. 797) and have been found to match for 84%. There were cases of mismatch in fear and happiness. In general, this outcome strengthens the confirmation of the existence of specific patterns concerning specific emotions.

Five explanations and the 'Lens model'

First, the matter of 'luck' seems hard to believe due to the great number of findings. Second, the thinking about musical performance and voice acoustics both being functions of 'body language' or 'acoustic cues' seems to general to be flawless. Third, the assumption could arise that both the musical as the prosodic learning intertwines and therefore is inseparable. Which,

without further elaboration, does not seem likely due to specific brain structures that have been found in both humans opposed to animals (Panksepp, 2000; Peretz, 2001; in Juslin and Laukka, 2003, p. 799). Moreover, the fourth explanation points to the evolution and maturing of the brain happening for both vocal and musical cues at the same time. However, the previous argument, again, also agues against this happening.

The fifth and final explanation reads that the musical cues are built upon vocal acoustics. The authors specify that only the nonverbal vocal cues are taken into account in this explanation. The most likely explanation is that the vocal acoustic cues developed first, and musical performance together, or prior to speech. Furthermore, the findings of this investigation are compatible with the 'Lens model' (See also appendix I), which was originally created to describe visual relationships. However, it had been taken into use to describe vocal cues by Scherer (1982, in Juslin and Laukka, 2003, p. 801). Later, Juslin (1995, 2000; in Juslin and Laukka, 2003, p. 801), described musical expression, while involving the context of the relationship with the listener through using the Lens model.

The Lens model entails the concept of 'codes,' (or 'cues') which are in relation to emotional expression 'communicated' to the listeners. The same codes are then used to understand the emotional content and since the codes are not absolutely stable in their meaning, the listener needs a combination or high number of codes in order to understand them and also into account has to be taken the listeners perception and intuition.

A neurological theory of emotional communication

The question to why listeners can respond similar to emotional performance as to vocal acoustic cues is explained by the authors through neurological evidence regarding

> "domain-specific and autonomous "modules" of the brain (Fodor, 1983), which react to certain acoustic features in the stimulus" (Juslin and Laukka, 2003, p. 803).

The modules are non-perceptual between sources and context and react therefore in the same way to acoustic cues (e.g. pitch, dynamics, loudness) in different situations, like a musical performance opposed to another person's speech. This view is a heavily debated topic and as there are many things to mention in favor of this theory, there are some critical sides as well.

For example, this theory does not take into account other special properties of music and it does not grasp all beliefs regarding the strengths of music. In this view music communicates the emotional content on the spot, using the same cues as a human voice. With technique and talent the acoustic cues are enhanced, going outside the limits of what the human voice is able to do. Consequently, Juslin and Laukka (2003),

> "speculate that many musical instruments are processed by brain modules as super-expressive voices" (p. 803).

2.7.4 Perspective on symbolic meaning

The meaning of music can be described through different views. Bonde et al. (2002, p. 36) described the theory of autonomy, which states that music does not have any other meaning outside the specific aesthetic process of the musical event. According to the theory of heteronomy music represents, expresses or symbolizes phenomena closely related to the people that make it. Bonde et al. (2002) reports the expressionist's position as a compromise between the two earlier mentioned theories. Both qualities are present in music and support each other when one tries to make meaning (Bonde et al., 2002, p. 37).

Symbolism is a typology that is very descriptive and with a great assuming power. The psychoanalytic perspective on musical parameters is explained through brief descriptions (see also table 4, p. 38) and circumscribed by the following assumption by Bruscia (1987),

> "Each musical element symbolically represents a particular aspect of personality, and each musical process corresponds to a psychological process" (Bruscia, 1987, p. 450).

Beginning with rhythmic components, like pulse, meter and patterns, which are commonly considered as "manifestations of instinctual energy." (Bruscia, 1987, p.450) According to the author, pulse (division of time in equal parts) transfers "security, stability, predictability, and a reassurance that instinctual forces or energy will not become overwhelming or disappear." Pulse is a feature associated with a guard against fear, sources of anxiety or over-stimulation. Pulse can be subdivided, or in other words doubled (or tripled and also into unequal parts). The effect on the previously mentioned calm atmosphere is the creation, growth and accumulation of forces or energy. Tempo (speed) has a similar effect and indicates an "increased activity, drive or urgency." Taken the three components together, the author condensed them in the character of "ground that holds, supports, controls and equalizes

energy and drives." Moreover, characterizing for music only containing grounds is that it goes nowhere. (Bruscia, 1987, p. 451)

Bruscia (1987), moves forward into rhythmic figures or "patterns" (when contrasts in "significance (accent) and value (duration)" occur, combined with a certain "direction (phrase)"). These components are no pulse, or in other words "impulse," and therefore they move on a scale of activity. They arouse stress levels and consequently a need for determination with it. The purpose of feeling safe does not imply remaining grounded, but rather continuing approaching and receding from objects. Moreover, forming a rhythm or pattern means moving away from the pulse and an ending rhythm becomes symbiotic with the ground, while reducing in activity. Moving away will always be "accompanied by the ever present danger of isolation and loss of one's grounding." The writer elaborates this further through the relationship of an infant and his mother, in which rhythm plays a literal role. Specifically, the imitation of the rhythm by the infant deserves a symbolic explanation. "Rhythm serves to ward off separation anxiety, by serving as its own permanent object and substitution for the pulse" (p. 451, 452).

TABLE 4. Symbolic definitions of different musical components derived from Bruscia, (1987, p. 451 – 455)

Pulse, subdivisions and tempo	"ground that holds, supports, controls and equalizes energy and drives"
Pulse	a guard against fear, sources of anxiety or over-stimulation
Subdivisions	a rush of energy but waiting in the ground
Tempo	"gauge of energy, signalling the need to be held up by a ground"
Rhythm	"ward off separation anxiety, by serving as its own permanent object and substitution for the pulse."
Meter	"basis for warding off moral anxiety"
Accents	"signals of revolutionary change or rebellion against authority."
Melody	"attitudes towards one's impulses. (…) When melodies never change, there is obsession with a feeling, or a compulsion to repeat one's past. When they change continuously, the feelings are fickle and unstable, or unformed."
Harmony	"attitudes or values concerning what is being expressed in the melody"
Tonality	"a gravitational force towards a point of rest within the centre of the self."
Phrasing	incongruence between rhythm and melody is; "drives are not consistent with feelings, in intensity or direction."
Volume	"force, power, strength, size and commitment."
Timbre	"an instrument (…) symbolizes its inner feelings and desires, both auditory and visually. Production techniques and sound vocabularies project the self-concerns of the body and the colourfulness of one's character." Interpretations can be related to the sounds, visual appearance and the physical relation ship between the body and the instrument.
Texture	"location and role of each character or part (…) within the self, between people"
Programs	revealed through techniques, like dream analysis

Similarly is meter ("organisation of pulses and rhythm into numerical units"), which serves many functions. In symbolic terms, "meter provides a basis for warding off moral anxiety. Developmentally, it appears in children concurrent with super-ego functions." In practice, the meter contains the rhythm. Similar to a pool containing water, the rhythm can flow outside the meter. The rhythm that fits into the meter will be provided with a certain shape and limit. Through the process of producing rhythms within the pool and ones that flow over the edge, the meter both reassures the containment of the remainder patterns and identifies the need for momentary adjustment. In the case of a stable meter, energy is incorporated in acceptable frames. In the case of an ever-changing meter, impulses are contained in the moment. Accents (organisation of tones in power and length) are similar to meter through their organisational quality regarding the revelation of direction. In other words, accents channel the intentionality of rhythms and facilitate meter. Recurrent, disorganized accents represent "anarchy and a deterioration of values." Contrariwise, recurrent, organized accents represent "an orderly overthrow of existing temporal regimes." Symbolically, accents "serve as signals of revolutionary change or rebellion against authority." (Bruscia, 1987, p. 452, 453)

Bruscia (1987) values the support regarding the flow of energy attached to emotions in the rhythmic components. However, in order to identify the nature of the emotions, tonality is needed. Tonal components serves as an umbrella for melody, modality, harmony and tonality. Melody (special dimension added to rhythm) is seen as the "expression of a specific feeling" in relation to identity. Symbolically, "melody reveals attitudes towards one's impulses." Another component is modality (scale presenting "intervallic possibilities"), which purpose lies in providing boundaries. Modality can be seen as a ground for melody, containing the expressed emotions. When the melody deviates from the scale, it is well defined and directed. From a symbolic perspective, "when melodies never change, there is obsession with a feeling, or a compulsion to repeat one's past. When they change continuously, the feelings are fickle and unstable, or unformed."

Harmony (consonant/dissonant depending on the correspondence with the melody) accompanies melody and communicates how the emotion in the melody feels, by creating an emotional context. Specifically, "harmony reveals attitudes or values concerning what is being expressed in the melody." Harmony can both ground and stimulate movement towards

other emotional fields. Moving quickly, harmony facilitates energy to flow. Opposing is the slow movement, which facilitates calmness and reflection. (p. 453, 454) Tonality is described last (orders the functions in each tone of a melody and chord in a harmonic development) and provides a hierarchy by determining the relative importance of each tonal component. Tonality is similar to modality in the in the way that it "provides and emotional centre to contain and direct." Tonality is similar to meter in it's organisational structure. The symbolic meaning of tonality (unlike meter) reads; "a gravitational force towards a point of rest within the centre of the self." (Bruscia, 1987, p. 454)

Other musical components that can hold important information are phrasing, volume, timbre, texture and programs. Phrasing (relation between rhythm and melody) "places the flow of rhythmic energy together with the shape of the melodic and harmonic feelings." When the rhythm and melody occur with an incongruent movement with respect to each other, then "drives are not consistent with feelings, in intensity or direction." Volume ("intensity and amount of sound") regulates the intensity of the emotional content in a phrase. The symbolic meaning varies; "force, power, strength, size and commitment." Timbre ("selection of medium, instrument, production techniques, and sound vocabulary") is a component that reveals the way in how the instrument is used by the body. Examples of symbolic names for timbre are; "colourful/drab, bright/dark, monochromatic/multicoloured, pale/intense and ugly/nice. Moreover,

> "an instrument (…) symbolizes its inner feelings and desires, both auditory and visually. Production techniques and sound vocabularies project the self-concerns of the body and the colourfulness of one's character."

The interpretation of the symbolisms can be related to the sounds, visual appearance, and the physical relationship between the body and the instrument. "Most of the symbolic derivations are psychosexual in nature, and refer to the oral, anal, phallic, and genital stages of development." (Bruscia, 1987, p. 455)

Texture ("organize, administer, and execute the overall plan of action") reveals what different parts of the music are doing in relation to each other and thus, how close to each other they function. Moreover, different components of the music can be expressive of similar or different emotional meaning. There are different ways in which the relations can be

understood. Examples are related to (un)equal energy, control or authority. Moreover, the roles competing/compatible/integrated; the relationships horizontal/vertical and independent/dependent can be changing. (Bruscia, 1987, p. 455). Concluding, different programs (images, stories) can be analyzed by the adoption of different techniques for 'dream analysis.'

2.7.5 Expression and depression

The way how humans express themselves can reveal much about their wishes, needs and also about their emotional states. The chances are great that people express more than they are aware of. Expression suggests not only verbal, but also nonverbal cues and in other words, (non)verbal language. They are often referred to as channels of communication in both daily life and research. Examples of nonverbal communication are body language, facial expression and vocal acoustics. When someone suffers from depression, their expression also changes. It is commonly known among clinicians, and research also supports that a person's communication changes when he suffers from depression. Though, both studies and procedures measuring and rating nonverbal behavior and vocal acoustics are lacking. There has been some attention to these components, which I will highlight through describing the results of the most current research on the matter.

Body movement

Joshi et al. (2013a) were inspired by body posture and motion related to certain psychological states. A gap in the knowledge exists regarding diagnosing mental illness in an (automated) objective way. The researcher found in their study by analyzing natural clinical data including 30 clinical cases and 30 healthy control cases that body expressions, head movements and gestures can be equally significant as facial expressions as a cues of depression.

A follow up analysis by Joshi et al. (2013b), re-analyzed the data of the clinical group of the study with 30 participants suffering from depression (rated with HAMD) to account for the reliability of the measures used. The results of the measures correlated positively with the symptom severity and point towards the successfulness of this objective measure to be used for detection of bodily states in people suffering from depression with different levels of severity. The measures included body part detectors and space time interest points (STIP).

The facial, head and shoulder movement was mapped and the results were reported as a holistic picture of the body movements through histograms. The results point towards less, smaller and retarded movements to be related with more severe depressive states. Moreover, in a review by Buyukdura et al. (2011) 'psychomotor retardation' was reviewed and related to depression in terms of slowed speech, decreased movement, and impaired cognitive function.

Voice acoustics

In a recent study of Mundt et al. (2012), 105 adults diagnosed with a major depression were included in a double-blind RCT to repeat the results of a previous study that investigated vocal acoustics as 'biomarkers' for the severity of the depression. The outcome yields a significant reliability for detecting speech pattern changes, predicting course of depression. Namely, the speech pause time, variable pause lengths were longer in more severely depressed patients and the speaking rate was lower. Yang et al. (2013), conducted recently a study on vocal prosody, where 57 participants were interviewed according to the HAMD, for rating the severity of the depression at three seven-week intervals. The hypotheses were supported by the results. Listeners were able to detect the severity of the depression (mild, moderate, severe) after listening to the recordings containing vocal material of the depressed participants in this study. Vocal timing (SPs) refers to the pauses between utterances and correlated positively and most strongly among other aspects of the study. As the depression decreased, the SPs became shorter and less variable for both the participant and the interviewer.

Statistical analysis revealed that both features combined were found to be strong predictors of the severity of depression. Furthermore, the intrapersonal aspects were examined. The SPs of the interviewer and the participant were statistically independent, but the outcome revealed that the interviewer changed in the same way as the participant. The other measured aspect of vocal prosody was Pitch (F_0). However no significant developments were found between severity of the depression and this feature. F_0 did correlate for the interviewer, which reveals that the interviewer sounded more expressive when the severity of the depression was high. Moreover, the researchers suggest that this expressivity is related to the non-expressivity of the participant. Concluding,

"Vocal timing could inform therapeutic decisions within diagnostic and treatment sessions and contribute to new forms of treatment that emphasize social communication in recovery from depression" (Yang et al, 2013, p. 148).

2.7.6 Research questions; musical expression of anger in depression

Depression is a pervasive disease that disables individuals and their environment. Nevertheless, music is a fact in many people's lives and is mostly consumed through portable media devices, such as I-pods, mobile phones and notebooks. Moreover, the influence of (portable) media in the world is undeniable. Wingstedt, Brändström and Berg (2008) state that the influence of narrative media on our behavior and overall learning style is great and growing in importance. Hence, it only sounds logical that the general expression and musical expression of emotions are intertwined in this twenty-first century. Reverting to music being a many-sided means for the regulation of mood states, in other words emotion regulation;

> expression and communication of emotions are an important part of developing a healthy emotional life and music is viewed as highly preferred, appropriate, versatile, effective and without a doubt innate as a tool to use for almost every single soul on this earth.

There is evidence that for the purpose of specific goals (emotion regulation), in a specific context (depression), music is not naturally handled in the most optimal way (Ehring et al., 2010). Similarly, it might be that certain emotion regulation problems, like anger (expression and its meaning) are related to depression in various ways (Freud, 1917/1963; Menninger, 1938; Storr, 1968; Schless, Mendles, Kipperman, and Cochrane, 1974; Weissman, Klerman, and Paykel, 1971; in Novaco, 1977; Quadrio, 2001; in Hussain, 2010). Individuals suffering from depression should be able to receive help or support, through for example helpful strategies and tactics. However, the relationship between depression and emotion regulation is not straightforward. According to Leader (2009), depression entails

> "a set of symptoms that derive from complex and always different human stories. These stories will involve the experiences of separation and loss, even if sometimes we are unaware of them" (Leader, 2009, p. 3).

Regarding the aid of music to stimulate a helpful emotion regulation strategy is most likely not enough. Support could be sought in other ways, including the professional health care, which should result in the predictable services including medication and inter-relational therapy and one may also be referred to music therapy.

Music therapy has been acknowledged as a fairly non threatening situation for e.g. investigating and working with emotions through music (Saperston, West, and Wigram, 1995, in Justlin and Laukka, 2003, p. 805). Generally, there is no clear consensus regarding different methods, thus an individual suffering from depression might encounter different practices (moreover in chapter 2.5.3). Different strands of research have been gathered to provide evidence and Norcross (2002) described almost all the working mechanisms in an effective psychotherapy, as being related. He yielded for the therapeutic relationship being the central topic. Moreover, an important aspect of the therapeutic relationship is the consensus regarding improvement rationales and treatment goals. Conversely, in order for a successful relationship to happen, the beliefs and expectations regarding causes and improvement have to be in unison (moreover in 2.6.1 and 2.6.2).

This thesis focuses on one specific music psychotherapy method named Improvisational psychodynamic music therapy. Erkkilä et al. (2011) have proven its efficacy as a treatment for depression and use different properties of music through musical improvisation in a therapeutic relationship to promote improvement of symptoms related to depression. In order to convey meaning of the findings and discussion of this thesis better, I will first elaborate on this specific method in a separate chapter. The main question of this thesis reads:

1   What are the characteristics of the musical structures in the improvisations representing 'the expression of anger' from two sessions of one case in the study by Erkkilä et al. (2011) receiving the intervention improvisational music psychotherapy?

3 IPMT

3.1 Roots, attitudes and principles

Improvisational psychodynamic music therapy (IPMT) has been described by Erkkilä et al. (2011). They have produced an RCT that showed significant improvement in clients suffering from depression after having received IPMT (moreover in chapter 3.7). IPMT is rooted in the theory and practice of Analytical music therapy developed by Mary Priestley (1994) and psychodynamic music psychotherapy described by Kenneth Bruscia (1998). Additionally, Erkkilä (2014) mentions the writings of the psychoanalysts Eero Rechardt and prof. Kimmo Lehtonen as having been influential. The experiences of both the therapist and the client are meant to be interpreted through concepts like transference, counter-transference, defence mechanisms, object relations, early trauma's and the meaning of one's psychohistory to their behaviour. Besides, the therapist should be open and able to work with less, or more complex, symbolic processes (moreover in chapter 3.6.1).

The therapy is offered in an individual setting and the main activity in IPMT involves creating music together. The patient doesn't need any musical skills as the music is improvised on obvious instruments, such as hand drums and xylophones (moreover in chapter 4.5.3). A clear-cut manual for IPMT does not exist, so the music therapist has to be able to act intuitively. In general this means that the therapist needs to be able to act on instinct and with empathic skills, to be sensitive to the client's feelings and emotional state of being. It is important for the construction and maintenance of the therapeutic environment that the therapist focuses his actions on the client's needs. In order to do this, the therapist has to be able to shift between his own feelings, the feelings of the client and his professional knowledge. Basic skills that facilitate the therapeutic attitude should be partly naturally present, but they are also partly taught.

The interventions of the therapist can be (non-)verbal and are mostly of a musical nature. Though, the therapist doesn't need to be a trained artist to utilize music to serve therapeutically oriented intentions. However, the creative ability must be present and assured as musical techniques are the main tools in IPMT. The musical interventions are based on 64

techniques that have been described first by K. Bruscia (1987). These techniques are musical by nature, but they are describing the musical phenomenon in psychotherapeutic terms, which makes it possible to make connections between the musical event and the analytical symbols. Besides, T. Wigram (2004) produced a book describing and teaching improvisation in relation to music therapy (moreover in chapter 3.4.2). Aside from improvisation it is possible that other musical activities are offered to clients, like listening to music, playing a composed song, or other musical games. Whenever is chosen to do so there should be a rationale embedded in the basic therapeutic attitude and theoretical background of the therapist. For example, playing a composed song can fulfil the need 'to feel safe' for a client when the therapist feels that the terrain of improvisation evokes too much anxiety in the client.

Feelings and emotions are very important in IPMT (moreover in chapter 3.5). Due to the intentionality of the therapist regarding activities done in the therapy I will not speak anymore of activities, but only of techniques. Furthermore, in order to establish a comprehensive text about IPMT I will elaborate in the next chapter on the possible structure of the treatment process and especially the structure of one session. Namely, the therapeutic process is theorized as a product of the relationship between the therapist and the client and for example, it is not accustomed to give clients homework. Additionally, before going into the theory behind IPMT, I will explain in a separate chapter what the inspiration and the proposed benefits of IPMT are.

3.2 The therapy process and the structure of one session

The therapy process can be as long as two years, but Erkkilä et al. (2011) found significant effects from around twenty sessions offered in a timeframe of two to three months. The following descriptions are based on the slides from a lecture given by Erkkilä (2014a) as a part of the music therapy master degree program at the university in Jyväskylä. The overall process of IPMT is not described in a clear structure that has to be followed, but rather as a framework where one stays within. The therapist can prepare the sessions and should also have an overview of the therapy process as a whole in mind.

Erkkilä (2014a) describes that the preparation of the session can entail different elements. In the beginning of the process the therapist should get to know more about the client. There are various options that the therapist can choose. Namely, (non-) structured assessment procedures have been designed and applied for the music therapy practice. They can be based on as little as the clients musical taste or initial improvisation. A more comprehensive start of the process could entail interviews and observations of the behavior. In the beginning of the process it is quite common for the therapist to go in a session with an open mind and find out more about the client, while being mindful for the client's needs in a supportive way. When the therapist has enough information about the client, some intervention techniques could be sketched. Further in the process the therapist can derive knowledge from his own notes, recordings or other observation instruments.

Interventions can refer to longer actions like activities and they can also refer to shorter actions like an attitude of the therapist in a verbal or non-verbal way. Mostly, the techniques that would be sketched refer to musical events and all techniques serve the treatment goals. Some procedural objectives could be to warm up the client for working or to evoke some kind of expression or communication. When a client discloses information, the therapist can focus the client on a particular problem, explore options available to the client, or encounter or confront the client's problem. Procedural techniques can also be focussed on the consolidation of what has been accomplished or simply to close the session (moreover in chapter 3.4.2.). When the therapist has an idea of the techniques that might serve the therapy process best he can go as far as planning the interactions in the session or in the timeframe of a couple of sessions. Moreover, the therapist can take into account what kind of roles he and the client might have due to the used techniques.

Erkkilä (2014a) mentions the importance of the focus on the needs of the client. Space for spontaneous, natural interaction should always be present. Aside from planning the techniques, the therapist should also consider other elements that might be beneficial to the therapy process. Examples are the kind of setting (sitting, walking, laying down), the kind of instruments (tonal, rhythmic, personal experience) and the kind of space (lights, possibilities available and ready). Sometimes it is advisable to include the client in the organization of the process or the session. Not knowing what will happen the next time can be a source of anxiety

for some clients. Especially with anxious patients it might be beneficial to have more structure in the session. Dividing the session into procedural phases, including a beginning, middle and end can be helpful opposed to free flowing sessions where the therapist follows the client from moment to moment. An element where the therapist can always think about as preparation is determining the emotional theme for a session as feelings and emotions are seen as very important in IPMT.

3.3 General benefit

Just like any psychotherapy treatment IPMT seeks to support, stabilize or improve general or specific problems in different areas of an individual's life. Fundamentally, IPMT has been found effective for enhancing the treatment outcome of patients with depression when offered for only two to three months (Erkkilä et al., 2011). With the additional use of music, IPMT broadens the traditional, verbal form of communication in psychotherapy to the terrain of abstract and non-verbal communication. Specifically, a client in IPMT is stimulated to express himself emotionally, symbolically and based on imagery. The readiness, strength and space of the client to express himself musically is thought to relate to the intensity and development of the therapy. Erkkilä (2014a) describes that improvisation is more likely to succeed in passing defence mechanisms than language as a result of the stimulation of this creative and spontaneous acting. Additionally,

> "IPMT shown as effective in activating "approach" tendency and reducing "withdrawn" tendency of the clients with depression" (Erkkilä, 2012).

Erkkilä et al. (2012) ascribe to the possibility for therapeutic potential and meaning through embodiment in free music making, bodily expression and involvement. This principle rests on the concept that both cognition and emotions are grounded in sensory-motor processes (Barsalou, 2008).

3.4 Role and meaning of music

3.4.1 The music of the client

Music making in IPMT refers to improvising. The most described form of improvisation should be free of musical skills, knowledge and techniques and is in it's optimal form not

based on rational thinking. Bruscia (1998) describes music as "playing around with sounds until they form whatever patterns, shapes, or textures one wants them to have, or until they mean whatever one wants them to mean" (Bruscia, 1998, p. 5). Erkkilä et al. (2012) describe that it is possible to capture images, symbols, memories, associations and metaphors that are connected to one's subjective truth (psychopathology) in many ways through the combination of musical improvisation and verbal reflection. In other words, music is seen as a "window" to the unconscious (Erkkilä, 1997; Erkkilä, Ala-Ruona, Punkanen, and Fachner, 2012). These understandings are supported by other pioneers as well. For example Juliette Alvin (1975) mentioned that "music is a creation of man – and that is why we can see man in his music" (Alvin, 1975, p. …). Also Mary Priestley (1994) stated that

> "music is always an expression of some kind, but sometimes it is the expression of acceptable feelings and at other times it is the expression of a defence against an unacceptable feeling or impulse" (Priestley, 1994, p. 136).

Erkkilä (2011) clarifies 'the act of improvisation' further in mental levels of processing (see also table 5). Improvisation is thought to exist on the pre-conscious level, even though conscious processes are likely to be always present as well. Erkkilä (2013) explains that the improvisation should not be thought of as representing either levels of consciousness, but as representing a sliding scale between different levels of consciousness. Therefore, some improvisation are also thought of as being representative of no symbolic or emotional content (see also table 5). In order to pick up different experiences, connections and when possible, aspects or severity of an illness, verbal processing is necessary.

TABLE 5: Meaning Levels Down to top of a musical improvisation, free translation from Erkkilä (2013)

Conscious	Subconscious	Unconscious
'cognitive' and logical playing without emotions, metaphors and symbols	typical playing in an open and intense improvisational process where factors such as sensual impressions, motor and special experiences and strong emotions exist	typical playing of a regressive/chaotic patient when she encounters overwhelming internal and external stimuli = fragmented music without obvious meaning
thoughts, words causes and consequences dealing with the improvisation	emotions, symbols, images 'windows' to unconscious act of improvisation	repressed material no access 'motive power' of improvisation

The role of music in IPMT has been influenced by theories and research regarding early interaction. Erkkilä (2012) explains music as 'Mother – infant interaction,' which is

characterized by primitive, auditory communication with emotional loading rather then with specific musical meanings. In order to evaluate the clinical relevance of improvisation, a helpful step is to detach the meaning from the musical composition. In other words, to define the meaning of an improvisation in IPMT it could be helpful to adopt a different vocabulary that describes music in clinically relevant terms. These can be opposed to the traditional musical terms that are used when music is described or evaluated as a form of art. There has not been developed a standard for this vocabulary. However, for the playing of the therapist there have been developed theoretical based terms.

3.4.2 The music of the therapist

Improvisations in IPMT can entail both a solo or a duet. Most of the improvisations should be duets as playing together is fundamental to IPMT. Furthermore, it is essential for the therapist to be flexible and creative as

> "improvising together with the client is something impossible to perform rigidly, because whole the idea of improvisation is based on mutual, sensitive, often emotionally loaded, non-verbal interchange" (Erkkilä, unpublished manuscript).

The therapist will intentionally utilize different musical techniques to support specific interactions or messages to the client. There are two important aspects regarding the use of techniques. First, Erkkilä (2013) explains that for an intervention it is most important that the therapist understands the idea of intervening and is able to explain why it was employed in a given situation. Second, in the case of musical interventions, it is wise to have a certain vocabulary that can elucidate specific musical actions, as music is from there to be embedded and elaborated upon in 'extra musical' theory. As mentioned at the beginning of this chapter, 64 musical techniques have been described first by K. Bruscia (1987). These techniques are musical by nature, but they describe the musical phenomenon in psychotherapeutic terms, which makes it possible to make connections between the musical event and the analytical symbols. The techniques are divided into eight musical categories and one verbal category is provided supplementary. Bruscia (1987) described the techniques and explained the function extensively. Without going into detail I will list the eight categories with a short description in order to give a brief reference.

1. Techniques of Empathy: These 6 techniques offer the therapist different ways conveying empathy directly to the client through music.

2. Structuring Techniques: There are listed only 3 techniques and the function is as straightforward as the title; to structure the improvisation.

3. Elicitation Techniques: These 6 techniques will help the therapist inviting a client to express more.

4. Redirection Techniques: In music there are many ways to go forward and these 8 techniques help the therapist with helping the client in different ways.

5. Techniques of Intimacy: Often it is important for the therapist to be able to regulate the distance between the client and himself and these 4 techniques are all focussed on how to do this musically.

6. Procedural Techniques: This category lists 10 techniques that are mostly related to each other by their active and organisational character. The name procedural was chosen perhaps because every technique entails more or less a set of behaviours that create a certain situation for the client that should be helpful.

7. Referential Techniques: There are 7 techniques that can help the therapist connecting the musical events to extra-musical phenomena.

8. Emotional Exploration Techniques: Some of these 10 techniques are to be utilized during playing with the client whereas others are shaping the form of the musical interaction with the client before the improvisation.

Tony Wigram (2004) wrote a book through which he teaches improvisation in relation to client centred and analytical music therapeutic understanding as he was taught by Juliette Alvin during his music therapy training. Most of the vocabulary and basic principles described by Wigram (2004) are in line with the work of Bruscia (1987). Furthermore, Wigram (2004) describes concepts that he has named himself, like 'extemporization' and 'frameworking'. Both terms refer to ways or structuring and shaping the improvisation. Likewise, he devoted separate chapters to the phenomena 'group improvisation' and 'thematic improvisation.' Wigram (2004) constructed the concept of 'transition' and called this "the most useful and important method" that he has developed. He defined the concept as follows.

> "an element/elements in the music is/are changed, either by client or therapist, to introduce a change in the musical dynamic in order to facilitate movement and change in the shared music making. This process can represent, or act as a catalyst for, change and movement in the personal life or therapeutic process of the client" (Wigram 2001 in Wigram, 2004, p. 140).

A transition can be as small as a 2 second moment and as big as 5 minutes and Wigram (2004) differentiated between three types of transitions. Seductive, limbo and overlap transitions. Seductive transitions move from one way of playing very gradually to another. Afterwards it is very difficult to differentiate by who, how or when the change took place. In the case of a limbo transition there is no real musical direction or purpose noticeable during the change. This can be experienced as a feeling of waiting for something. The overlap transition is characterized by an introduction of a new element in the improvisation while the existing elements remain, thus an overlap of old and new elements take place. Additionally, Wigram (2004) also briefly describes some alternative options for making transitions, using for example emotions, feelings or mood, stories and fantasies.

3.5 Role and meaning of emotions

The setting of IPMT is principally individual, so there are two persons with feelings and emotions in the therapy session. There is a considerable difference between the two though. The one is the therapist and is going into the relationship from a professional position. The other one, the client, is going into the relationship from a natural position. Therefore I will discuss in two separate paragraphs the role and meaning of emotions.

3.5.1 Emotions of the client

In general the emotions of the client are very important in IPMT and all feelings of the client are accepted. It is possible that the client presents the therapist (non)verbally with important feelings or emotions towards an event. It can also happen that important feelings manifest themselves only during and after improvising with the therapist. It depends on the length of the process and the moment where the client is in the process how feelings and emotions become manifest. The same applies to how the therapist will address these feelings and emotions. Not all emotions that the client expresses are expressions that are related in 'the here-and-now'. It can be that the client reacts with an emotional behaviour that in fact addresses a pain or anxiety in the past. This many sided psychoanalytical phenomenon is called "transference". Bruscia (1998) has written extensively about transference in music psychotherapy as useful tool in music psychotherapy.

3.5.2 Emotions of the therapist

In a method like IPMT, the emotional process is extremely important in theoretical terms, so it is extremely important for the therapist to be able to be sensitive and available on emotional level. In other words 'to be here-and-now.' Additionally it is important to consider for the therapist to be(come) able to use one's own feelings as an aid in the situation of musical interaction with the client. This phenomenon is called by Freud (in Bonde, 2002, p 76) 'countertransference' and has been redefined by many scholars. Erkkilä (unpublished manuscript) mentioned countertransference as a "psychoanalytic concept with specific meaning, and even with unique reformulations, within music therapy" (Bruscia, 1998; Priestley, 1994; in Erkkilä, 2014c, in press). In the practice of music therapy it means that the therapist is able to relate his emotional state regarding the musical improvisation and the client opposite of him.

Priestley (1994) differentiates 'countertransference,' 'e-countertransference' and 'c-countertransference' from each other. In music therapy counter-transference refers to positive or negative feelings of the therapist towards the client that origin in his own past, but are brought up through feelings related to transference, which the client projects on the therapist. It is the up to the therapist to recognize these feeling and utilize them whenever possible. In the case of positive feelings it can be a rewarding job. In the case of negative feelings it can be difficult, but surely rewarding to investigate, as countertransference always points to important areas of self-development. Another type is c-countertransference, which is referring to 'complementary.' In this case the therapist complements, in a way, the client by reacting in the same way as the environment has reacted to him in the past. In the case of negative feelings it is not a desirable situation as the patient is merely reminded of the past event. In music therapy e-countertransference, which refers to 'concordant', can resonate loudly through the musical improvisation in IPMT. It refers to the feeling of therapist that is caused by the repressed or unconscious feelings expressed by the client. These are emotions that the therapist should contain and give back to the client by expressing them musically, which can stimulate the client in becoming conscious and being able to deal.

3.6 Theory regarding working mechanisms

3.6.1 Therapeutic process

IPMT is explained through theory of psychoanalysis. As described earlier, not only conscious feelings, but also un- and preconscious feelings are in the focus of the practice and process of IPMT. There are two processes distinguishable. The primary process is concerned with

> "the regulation of unconscious wishes, needs and feelings; is able to pass repression; allows mobility of ideas and paradoxes" The secondary process is concerned with "the conceptual organisation of memory; logical and realistic behaviour and thinking; controls and restricts emotion" (Rapaport, 1950 in Erkkilä, 2012).

Musical improvisation takes up a central role in IPMT. The primary process can be visual in the musical improvisation, whereas the secondary process becomes clear when dealing with musical improvisation verbally. The theoretical methods where IPMT is rooted within are first analytical music therapy (AMT) and second psychodynamic music psychotherapy (PMPT). Analytical music therapy is described by Priestley (1994) as

> "the analytically-informed symbolic use of improvised music by the music therapist and client. This creative tool which is used to explore the client's inner life so as to provide the way forward for growth and greater self-knowledge." (Priestley, 1994, p 3).

In AMT the psychoanalytical concepts as defence mechanisms and symbolic processes are very important as they are part of the theoretical framework that is used by the therapist working with IPMT. Defence mechanisms are ways of people to protect themselves when they feel endangered. Freud discriminated between two sources of anxiety. Traumatic and signal anxiety. The first kind refers to anxiety that is overwhelming and uncontrollable. Signal anxiety, however, is more manageable as there is still mental space left to undertake action, or rather defend. Everybody uses defence mechanisms up to a certain degree and this is considered necessary. There are 31 terms with which the defence mechanisms have been described in AMT. Examples are repression, denial, splitting, projection, suppression, regression, intellectualisation, depersonalisation and humour. These terms are used to appraise the interaction in IPMT as well. In PMPT, which is described by Kenneth Bruscia (1998), there are four distinctive settings described where music has different roles. 'Music as psychotherapy' is characterized by the absence of verbal discussing. When verbal interaction is used to supplement the musical activities, 'music-centred psychotherapy' is spoken of. In 'music in psychotherapy' both the verbal and musical course are equally important. However

in 'verbal psychotherapy with music' the music is considered not to have a big role or function in the whole process of therapy. In IPMT can be spoken of 'music-centred psychotherapy.'

3.6.2 Relationship between the client and therapist

Bruscia (1998) described PMPT as processes of transference and countertransference between the client ant the therapist. Although there is no scientific evidence for the existence of these forces within the relationship, they serve the therapist well in constructing a truth about the therapeutic interaction together with the client. "They are images and metaphors for the client-therapist relationship" (Bruscia, 1998, p. xxii). Not every event, meaning both the persons and the therapy, represents transference and one should take note of this when looking at every single event. Transference and countertransference are theoretical constructs functioning in psychodynamic theory. It is not self-evident that one can transfer them into other theoretical systems of thinking and expect them to be as equally meaningful.

Bruscia (1998) lists four assumptions that are at the basis of this psychodynamic thinking. First, all people have developed attributions towards phenomena in the world in interaction with their family, friends throughout their life. In the present people relate to those phenomena through relationships by comparing and generalizing, but basically repeating their experiences in slightly altered ways. Third, people function in different states of consciousness, which reflects our degree of awareness of our own behaviour. Fourth, both the therapist and the client bring their own attributions, relating patterns, only partly conscious to the therapeutic relationship. When dealing with transference, one can notice whereon the transference is focused. This is called the 'object' of transference, hence the focus could be the therapist, but also the music or something else. In music therapy it is very helpful if the focus on the object shifts between the music and the therapist. This way the client can cash different types of helpful experiences. Besides, for the therapist it can be challenging to be representative of the object of transference.

3.6.3 Improvisation

Improvisation is thought of as a means for bringing material to the table for verbal processing and as being possessive of qualities that evoke physical activation or relaxation. The verbal

process takes the improvisation towards the conscious functioning, like rational thinking, or reflective evaluation. In other words, in improvisation the primary process takes place and fuels the secondary process. The material from the improvisation could be part of a symbolic process. Bruscia (1998) stated though that not even music can access the unconscious directly. However, unconscious material could be a motive power of the improvisation, disguised as the initial motivation for producing sound with an instrument. The demanding task in IPMT is to make the transitions from improvising to talking and then back to improvising again. There are different levels of consciousness in interplay. Moreover, improvisation is referred to as a central place in the light of the concept 'potential space.' Ogden (1985) described potential space as being situated between reality and fantasy. Winnicot (1968) stated that psychotherapy means two people who are playing, while the music therapist behaves accordingly to enable the client when the client gets away from the ability to play.

There are also different senses in interplay, for example tactile and auditory senses are always involved in improvisation. Stern (1985) described "vitality affects" as "kinetic qualities", aiming for feelings that are evoked by changes in "motivational states, appetites and tensions" (Stern, 1985, p. 54). In other words, Stern (1985) explains how people are affected by how we conduct an action without referring to the expression of emotions. Also the senses people use to express don't have to be the same as the senses used to perceive these dynamic ways of being. People make lots of shifts between feeling and perceiving vitality affects. Empathy is a fundamental answer to how we communicate on this level and also a very important aspect of improvisation in IPMT. Erkkilä (2013) explains that it is likely that the meaning of music is based on emotional, dynamic forms opposed to aesthetic content description. Examining music in terms of clinically relevant meanings and the primary process in therapy becomes easier when the meaning can be investigated without the hindrance of a musical aesthetic mask. There have been developed several tools to do this (moreover in chapter 4.3 and 4.4).

3.7 Study by Erkkilä et al. 2008 - current

3.7.1 Research design

Erkkilä et al. (2011) investigated IPMT as an individual therapy for patients suffering from depression in a randomised controlled trial (RCT) administered in Jyväskylä, a city in middle-Finland with 135 000 inhabitants (City of Jyväskylä, 2014). The results of the RCT demonstrated that IPMT is effective when compared to treatment as usual when only relatively short interventions have been offered, namely over the period of 2,5 - 3 months, bi-weekly, 60 minute sessions (Erkkilä et al., 2011, p. 134). The focus on IPMT was chosen as this approach is common in Finland and in particular in the music therapy research and training clinic of the department of music in Jyväskylä. Moreover, the implementation was based on extensive clinical experiences, thorough theoretical analysis by music therapy scholars and relatively long training backgrounds. The RCT was initiated as music therapy studies on this level often lacked methodological strength (Gold and Lie, 2009; Maratos, Gold, Wang, and Crawford, 2008).

The data was collected in various, comprehensive ways. Further analysis was still possible after having published the initial RCT outcome. From a professional point of view, understanding the process through which the outcome was achieved are of equal, if not greater, importance than the outcome itself. However, further research is needed and actually is in progress nowadays using a mixed method design. The expectation is that by utilizing a mix of qualitative and quantitative strategies a better understanding will arise regarding the understanding of why and how the patients in the RCT improved. Erkkilä (2014c, in press) specifies that the type of mixed methods applied in this case are called the embedded experimental model (Creswell and Clark, 2007; in Erkkilä, 2014c, in press). In this model, the priority is given to the quantitative methodology. In the main publication of the study, important questions remained unanswered. For example, how clinical improvisation is connected to emotional processing and recovery in the treatment of depression and how improvising affect processing of the client's illness.

3.7.2 Types of data

The data collected by Erkkilä et al. (2011) is based on the work of ten clinicians that have handled twenty-nine therapy processes. There is over six hundred hours of videotaped

sessions and more than seven hundred clinical improvisations available in different a digital formats (e.g. MIDI and Audio) for analysis (moreover in chapter 4.4 and 4.5).

3.7.3 Relevant outcome

The outcome of the RCT investigation used various outcome measures, namely the Montgomery-Åsberg Depression Rating Scale (MADRS), Hospital Anxiety and Depression Scale (HADS) and General Functioning (GAF). "The treatment response was more than two times better in music therapy with standard care than in standard care only. Treatment response was calculated from primary outcome measure results (depression scale) – improvement from baseline > 50% = respondent; improvement from baseline < 50% = non-respondent." (Erkkilä, 2014b, in press).

3.7.4 Training therapists in the method

In order to optimize the effect size of a RCT it is helpful to secure the overall coherence in the study. Bellg et al. (2004) investigated 'fidelity,' meaning research strategies that are focussed on enhancing reliability and validity in the overall methodology in health behaviour studies and recommended training of care providers that participate in the study. The training entailed becoming equipped with the technological instruments, recording during the sessions and structured ways of keeping diaries containing the content of the sessions. Furthermore, achieving a common understanding regarding the intervention and its practice produces valuable information about the possible working mechanisms of intervention, that is to be investigated later on. The training and supervision sessions were also focussed on defining common principles that should be guiding the clinical work. The general principles, like theory, instruments, duration of each session and process were decided upon beforehand. Decisions regarding therapeutic attitudes, specific techniques and problem solving strategies were discussed also after the trial had already started. In order to use the content of the training and supervision sessions, Erkkilä et al. kept hold of the main themes that consequently have been subjected to content analysis. The results are described in separate themes, including the perspectives and body language of the client and therapist, the music, and the verbal interaction as separate themes of discussion.

In this thesis I will only highlight some central themes in order to offer ideas that are complementary to the practice and theory already described earlier in this thesis. To begin with the therapy process in general, Erkkilä (unpublished manuscript) reccommends starting a therapy session in "the here and now" while refraining from the use of jargon. Moreover, although the therapist participates actively in the sessions, he also needs to be in control in terms of keeping the focus on clinically relevant themes by remembering what happened before. Furthermore, whenever the therapist experiences anxiety related to the musical (chaotic) expression of the client he must process these immediately, most recommendably with supervision. Additionally, the body language of the therapist is important, thus an increased awareness of the therapist in his own sensations, reactions and expressions can be helpful to the therapy. Other concepts that might be of importance are the bodily affective state and body memory. Erkkilä (unpublished manuscript) mentiones also the therapist's 'kinesthetic empathy,' which refers to the embodiment of the emotional state and movement quality of the therapist. By mirroring affective and emotional states of the client, the therapist can be guided towards a deeper understanding of the client's inner world (Dosamantes-Beaudry, 2003).

Regarding the perspective of the client, Erkkilä (unpublished manuscript) recommends that the therapist should be patient in the beginning of the treatment process awaiting emotional and symbolic expression from the client. Offering stucturing techniques are recommended to use in the beginning of the process. Moreover, the therapist should be tolerant and very open to the personal style of improvisation of the client as any aspect could contain symbolic values. Erkkilä (unpublished manuscript) recommends understanding, tolerating and fulfilling the need for support of the client. For some clients they are crucial for the process. Bodily gestures, reactions, positions reveal often a lot about the state of the client. The body expression is connected to the emotional state (Castellano, Santiago, and Camurri, 2007). Namely, the physical activity of clinical improvisation is revealed by the dominant body position, facial expression and the use of the hands and the energy flow when moving.

Regarding clinical improvisations, there are special qualities that can be distinguished. First, improvisation often evokes talk, that has to be regulated by the therapist. Second, the improvisation leads the client from one mode of consciousness into the other. These shifts of

consciousness can be different between improvisation and talking as well. Third, the level of arousal is affected as well by the improvisation and is typically enhanced. All these qualities are thought of as working mechanisms behind the breach of initial resistance, facilitation of self-expression and passing of defences. Some rough guidelines for clinical improvisation are given regarding the amount of structure used, namely that no client is the same and structure should be weighed and measured before applied. In free improvisation structure can still be given. In the case of a chaotic playing client, the therapist is well advised to play a frequent pulse in a clear rhythm if he wants to calm down the playing. Furthermore, the energetic presence and the initiatives made by the therapist, reflecting "being present," can improve the focus of the client. Erkkilä (unpublished manuscript) refers to this as the "being-present-effect". Special in this situation was the access to the recordings of the improvisations. Listening to the recordings lead often to a deeper insight on different meanings of the improvisation.

Although there is much power in the act of improvising, sometimes it is not appropriate to improvise and the therapist is advised to keep this in mind when working with clinical improvisation. This can then be related to an emotional theme to the client. Still, the opposite is maybe more common. The therapist should be aware of defensive talking before or after improvising and improvising itself can then be a solution to turn to. Also for therapists it is advised to make well thought through verbal interventions, especially right after the improvisations, because of the shifting of consciousness. Overall, talking helps with gaining insight from the improvisation. Furthermore, having an initial discussion in the beginning of an IPMT session is an important part that can be the motivation for bringing up an emotional theme.

4   RESEARCH QUESTIONS AND METHODOLOGY

Chapter 3 described the study on the effect of improvisational music psychotherapy. Erkkilä et al. (2008) investigated this intervention added to the standard treatment of depression in adults and the role of music in improvisational music psychotherapy is described as "means of communication and expression" (Erkkilä et al., 2008). Erkkilä et al. (2011) continued the research on improvisational music psychotherapy (IPMT) and depression and discusses the role and meaning of music as "a preverbal or early mode of communication, which may serve to extend and complement verbal expression and communication." (Erkkilä et al., 2011, p. 137). Furthermore, Punkanen (2011) researched the role of musical perception in the same population. "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." (Punkanen, 2011, p. 51).

The purpose of this master thesis entails creating an earmark for the research that has been performed by Erkkilä et al. (2011) through a qualitative approach, including a personal approach to MTTB as a tool for improvisation analysis in music therapy. The investigation of these specific improvisations are interesting, because in general the musical communication has been pointed out as a working mechanism in IPMT that is supported by the psychoanalytical theory underpinning (moreover in chapter 3.4). Specifically, the expression of anger is highlighted, since the relationship with depression has been accentuated by several authors (moreover in chapter 2.4). More specifically, questions in this study are:

1. What are the characteristics of the musical structures in the improvisations representing 'the expression of anger' from two sessions of one case in the study by Erkkilä et al. (2011) receiving the intervention improvisational music psychotherapy?

2. Why did the 'moment-by-moment experienced changes' occur like they did?

3. How did the two improvisations differ or agree?

4. What did the process of microanalysis contribute to the use of MTTB graphs?

5. How did MTTB contribute to the process of analyzing the data?

The first question will be answered by committing to a qualitative investigation. Through fitting the principles of microanalysis to the current data, a rather detailed impression will be

created. The terminology embedded in MTTB will be used to describe the musical features and a few principal assumptions regarding emotional expression through musical improvisation will be applied (moreover in chapter 4.4). Specifically, the 'moment-by-moment experienced changes' will be discussed in the context of the literature concerning musical performance cues and vocal acoustic cues. The answer to the second question will be partly derived from the attempt to translate the musical features to one or more of the five basic emotions. Additionally, the significance of the cues will be analyzed concerning its symbolic value, based on a chapter regarding "psychoanalytic and existential perspectives" (Bruscia, 1987, p. 450) (moreover in chapter 4.6) and a reference to the description (made by the therapist) regarding the content of the improvisation will be made.

Moving forward, the results of the analysis will also be discusses in the context of emotion regulation and depression and psychodynamic principles in IPMT. Some speculations will be made in second attempt to answer question two. The answer to question three is predominate in the analysis on the levels regarding both the 'episode' and the events (moreover in chapter 4.3). The results will be discussed in light of the severity of the depression. Particularly, the process in the therapy and the therapeutic relationship will be taken into account. Concluding, by answering question four and five, some limitations and advantages of this single case investigation will be elaborated upon in the light of triangulation in qualitative research (generating codes), familiarizing with the data and dealing with assumptions and using video recordings and MTTB for IPMT.

4.1   Single case study and triangulation

In the field of music therapy more case studies than controlled trials have been reported. It is the most common type of evidence found in the literature about music therapy (Bonde et al, 2002, p. 261). There are some explanations available. Bonde et al. (2002) explains that a logical theoretical viewpoint is constructivism, which points out that there is not merely one truth. Music therapy has been developed by different people in different countries and there is no outspoken consensus about the methodology. Good practice is dependent on the population, the situational possibilities and on the therapist with his musical and therapeutic background. Kenny and Wheeler (2005) describe from a practical point of view, that the

subjectivity of the therapist will be optimally utilized when he himself acts as researcher. A case study design that allows the viewpoint of the therapist to come forward will also allow valuable information regarding music therapy to surface. Opposed to a case study, the quantitative study analyzes therapeutic outcome with quantifiable components of the therapy which leans on the positivistic paradigm. The opinion that there is only truth in facts that lead back to logical, mathematical evidence. In the western society, the quantitative studies are valued as holding a greater truth than subjective single case studies (moreover in chapter 2.5.3). Kenny and Wheeler (2005) explain that the single case study is viewed as the place to explore "new" truths, rather than to be representative of a truth. Moreover, an interesting development is the inclusion of the case study design into this positivistic viewpoint, by the use of mixed methods.

The process of triangulation of certain methods is applied to contribute to the reliability and validity of the methods. "Triangulation always makes for deeper understanding" (Polkinghorne, 1983, Webb, Campbell, Schwartz and Sechrest, 1966, Webb and Weick, 1979 in Clair, 2003, p. 249). Furthermore, in the discussion of this thesis I will describe the results of the between – method triangulation. This entails using different types of data and different methodological strategies. The issue of construct validity is addressed as part of the main findings of this case study. Namely, the findings of the analysis of different types of data are described in the degree of being accumulative on to one another. Lastly, the external validity is not addressed as such in this thesis. Naturally, the results of this thesis are only valid for the case discussed in this thesis and are meant to inspire for broadening the horizons of this investigation.

4.2   Qualitative data analysis

Bruscia (2005) sketched an overview of distinct tasks that may be connected with the analysis of descriptive data and with the reference to this extensive chapter I have started to align the process ahead of me. The analysis of this data set has been aimed to generate variable sets and qualities. The separate cases will be described accordingly, quantifying the content. The focus of the analysis lies on the content, but there will also be some remarks on the form of the data in the discussion. First an overview was created by confirming the presence of all components

of the data and the video material was disclosed to me first. MTTB graphs have been created, which made it possible for me reduce the data (with the video material as a reference). Consequently, segments the data could be analyzed, distinguishing different events and two 'moment-by-moment experienced changes' according to the principle of microanalysis (moreover in chapter 4.3). The coding of the data has been done partly by MTTB and partly manually. The Body Language will be presented in a Microsoft excel sheet with given codes. In general, the purpose of the coding entails giving explanations of the intentionality, dynamics, contingencies, event sequences, and relationships found in the data (explanatory case study). Microsoft excel seems to offer most of the qualities that are desired in this situation. Standard codes are used as axial codes to further organise the descriptive codes.

4.3   Microanalysis in music therapy

Microanalysis entails the "detailed analysis of a small but relevant amount of data drawn from a single experience with a client, or a single session" (Wheeler et al., 2007, p. 14). In music therapy it is important to be able to communicate about small changes in the therapeutic process. Especially because it is quite common for a music therapist to be working in a multidisciplinary team where communication and consultation are part of the daily practice. The practice of research in music therapy benefits from detailed descriptions of the therapeutic process. There has not been much research about, for example, how the observed working mechanisms of music therapy look like or why the predictors of change can be found in music. These are examples of topics that could be addressed with microanalysis. In other words, microanalysis addresses 'how' and 'why' questions.

In the book 'Microanalysis in music therapy' by Wheeler et al. (2007) different systematic methods and techniques of microanalysis in music therapy have been collected. The descriptions include methods and techniques for video, music and text microanalysis. Wheeler (2007) describes four different micro-levels in process analysis. The first level is called 'session,' which refers to a single session of a music therapeutic process. This level has the largest timeframe of all the levels. It should be one session in the therapy process of a client, because this timeframe is still useful for the abovementioned purpose in the music therapy practice and research. The second level is called 'episode.' An episode can mean a

certain part of the therapy session like an improvisation or reflective conversation with the therapist. The third level is called the therapy 'event,' which is for example a short fragment of music or a conversation. The fourth and smallest level can be an individual cognitive process and is called a 'moment-by-moment experienced change.' An example could be a neurological process or a short event representing a change that could be based on emotional content or interaction.

4.4   Music therapy toolbox

Music therapy toolbox (MTTB) has been developed mainly by Olivier Lartillot in the Centre of excellence in interdisciplinary music research in Jyväskylä, Finland. MTTB is a MATLAB environment based toolbox that provides both a numerical and a graphical representation of certain musical features of an improvisation on MIDI instruments. MATLAB software is an environment that is suitable for analyzing data, developing algorithms, but also creating models and applications. MTTB runs in a MATLAB environment, because it is based on the MIDI toolbox developed by Eerola and Toiviainen (2004), who described that MIDI toolbox can analyze and visualize MIDI files in a MATLAB environment. The musical features presented by MTTB are related to "the density of the notes, dynamics of playing, usage of pitch (pitch height), duration of notes, and the clarity of pulse and tonality" (Erkkillä et al., 2004, p. 4). Moreover, Luck et al. (2006) describe that all the abovementioned featured have been calculated through the 'onset' (attack) and 'offset' (release) parameters of the keys of the instruments, the pitch (corresponding keys on the instrument) and the velocity parameters (strength of attack of the key).

The different musical features have been embedded in unique computational methods. The feature density is calculated by extracting the number of played note per time window. Duration refers to the duration of the notes in the window. Articulation, referring to the amount of short silences in a window, is calculated by counting the amount of time intervals between the notes. A low level of articulation implies legato and the opposite implies a staccato articulation. The silence factor refers to the amount of long silences (>2sec.) in the whole improvisation. The pitch has been extracted by naming all semitone keys of the MIDI keyboard and it has been calculated through the value of the notes in a sliding window. The

velocity is calculated by the extraction of the strength of the onset from the hit on the keyboard. Dynamics have been calculated through the velocity parameter and, similarly to the pitch, calculated through a sliding window. Tonality related features were calculated in a sliding window through the "Krumhansl-Schmuckler keyfinding algorhythm" (Krumhansl, 1990; in Luck et al., 2006, p. 38). In the case of two participants, the features can be presented separately. Other features are pitch clarity and dissonance. The first was calculated through 'pitch-class' distributions correlating with twenty-four key profiles, which consequently provided a framework of twelve major and twelve minor keys. The latter, also called sensory dissonance, is related to the presence of "beating phenomena caused by frequency proximity of harmonic components" (Luck et al., 2006, p. 38). Pulse was calculated through the construction of

> "summing Gaussian kernels (…) centered at the onset of each note. The height of each Gaussian kernel was proportioned to the duration of the respective note (SD 50 ml sec.)" (Toiviainen and Snyder, 2003; in Luck et al., 2006, p. 38).

Moreover, the pulsation function was calculated for positions in a sliding window, which resulted in a pulsation diagram. Pulse clarity is a function of the pulsation diagram. The maximum values of each column in the pulsation diagram were taken. Tempo is collected as values that are associated with the maximum values in the pulsation diagram. Another feature in MTTB is called 'imitation diagram (ID)'. This feature produces a separate graph that shows the degree similarity between the musical features of the two participants. This allows the observer to detect behavior of imitation and synchronization easily. For this thesis only the graphs with musical features have been computed (See also appendix III - XII). However, synchronization has been presented as an additional feature of the MTTB graph.

Reading and interpreting the MTTB graphs can be challenging and it is important to consider using this tool in close relationship with the audio and/or video material, because MTTB "is not give any interpretation of the meaning of a finding" (Erkkilä, Ala Ruona, & Lartillot, unpublished manuscript). MTTB is limited to only analyze MIDI files, but MTTB is still being developed and recently, a fixed version of the software appeared. J. Erkkilä briefed regarding the improvement of specific technical issues (personal communication, March 21, 2014). For instance the MIDI files can be imported into MTTB and a specific sequence can be chosen within the program. Whereas, before the MIDI files had to be cut beforehand.

However, the legend of the graphs is not always available. This makes it impossible to perform statistic calculations, but for single case studies and microanalysis purposes it has become easy to use.

4.5   Selecting the case and choosing the types of data

For this thesis the data was selected from a population participating in a RCT study performed by Erkkilä et al. (2011) (see also figure 1). For this RCT study the therapeutic intervention was adapted in order to create the optimal circumstances for collecting the data. Practically this means that both the client and the therapist were situated in a medium to large room with three instruments in front of them. Two of the instruments were electronic and recorded as MIDI files and one was acoustic and recorded as an AUDIO file. Furthermore, the sessions were captured on video and the therapist kept a standardized journal with notes referring to individual sessions. The principle of purposeful sampling has been applied in order to select a case from the initial dataset. Kenny and Wheeler (2005) describe purposeful sampling.

> "In purposeful sampling, research participants are selected because of what their study may bring to the research question, not because they are necessarily typical of the group being studied. (…) because there are things that can be learned from studying them" (Kenny and Wheeler, 2005, p. 64)

In chapter 1 of this thesis I have explained the possible role and importance of the expression of anger in the context of depression and the possible benefits that music therapy offer as a process-oriented treatment for depression with the focus on emotions (regulation). The first step for collecting the data for this case study entailed choosing a client that was expressing anger as part of the therapeutic process (see also figure 1). The importance of any case has been confirmed by the positive outcome in the study. The results of the chosen case have been verified in terms of the severity of the depression and the recovery. Furthermore, regarding the expression of anger, acknowledgement has been given by the therapist for the chosen 'episodes.' Namely, the sessions of the chosen case were checked in terms of the notes that had been written by the therapist after each session. After that, two improvisations were chosen based on the memory of the concerning therapist.
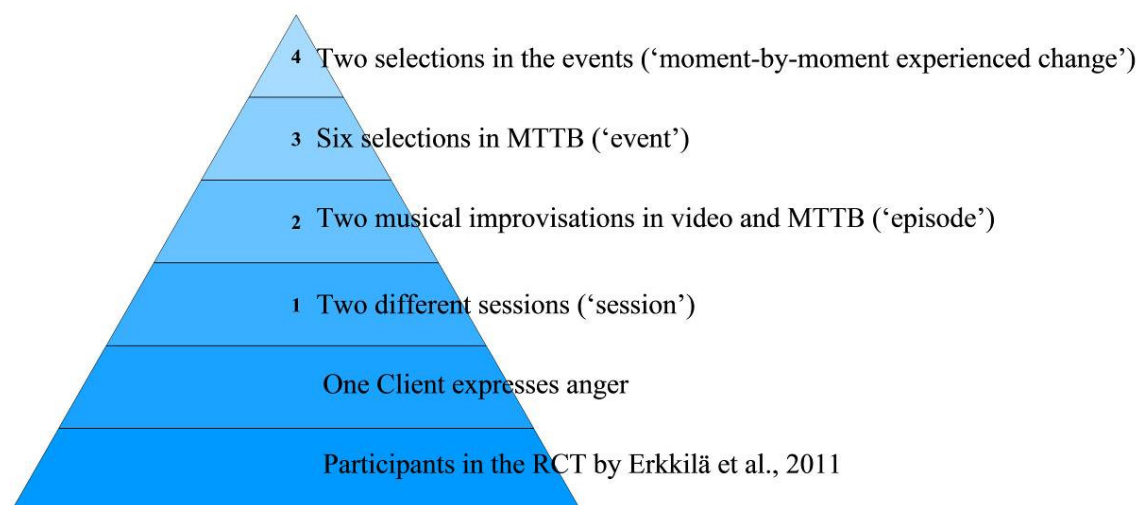
FIGURE 1: Process of collecting the data

A deliberate choice was made to choose one improvisation that had occurred in the beginning of the process and one at the end of the process. The client has improved in terms of severity of the depression over time and the data has been collected over time. This made it possible to attempt to recognise differences or similarities between the two improvisations originating from different points in the process. The process of selecting the specific 'events' and choosing the 'moment-by-moment' experienced change are explained later on as part of the results of the analysis (moreover in chapter 5.1.3). A flexible attitude has been adapted with respect to selecting parts of the data. Kenny and Wheeler (2005) also point out design flexibility as an important aspect of qualitative research.

> "(…) design is not set and inflexible and may change based on the information that emerges and what the researcher learns during the research process. The researcher pursues new areas as they emerge so that the research evolves, taking advantage of what is learned in its earlier stages" (Kenny and Wheeler, 2005, p. 64).

Figure 1 represents the different micro-levels of the data of this study. The first level, 'session,' entails two different sessions in the process of one client from the data-set of the RCT performed by Erkkilä et al. (2011). The second level, 'episode,' entails the improvisations that were expressive of anger in those sessions in the form of both video material and MTTB graphs. The third level, 'event,' entails selections from those improvisations in the form of new MTTB graphs. The fourth level, 'moment-by-moment experienced changes,' entails some short selections in the form of new MTTB graphs described and discussed.

4.5.1 Video recordings

The selection of the video recording has been made by my teacher. On the video both the therapist and the client are visual from a side view (see also figure 2). In order to allow the interpretation of the improvisation as a whole, a transcription of my observations regarding the non-verbal language used by the client and the therapist was transcribed into verbal language codes in a Microsoft excel matrix. The matrix contains behaviours of different body parts that have been observed separately (see also appendix XIII and XIV).

FIGURE 2. "A sketch from the trial's clinical setting. (…)
Both improvisers have identical instruments." (Erkkilä, 2014b, in press)

4.5.2 Therapist's diaries

The diaries of the therapist were investigated by my teacher on content specific material. The content has been made available to me through a translation from Finnish into English by my teacher. The translations are presented as an element in the findings of this thesis (see also chapter 5.1.2).

4.5.3 Musical MIDI data

The improvisations that are analyzed in this thesis have been recorded as MIDI files. This was possible through the execution of the study by offering MIDI based instruments to the client, namely the 'mallet kat™' and the 'digital hand drum'.

> "Mallet kat™ is digital, xylophone like instrument with rubber keys supposed to be played by mallets. It does not produce any sound by itself but must be connected to a sound module or equivalent" (Erkkilä, 2014).

The data that represents the mallet kat™ is reducible to the onset, offset and the velocity with which all the semitone keys of the keyboard are played. This information is then translated into musical features by MTTB. The same goes for the 'digital hand drum.' The third instrument used for this study was the jembe, which was recorded as audio waveform. This limited the researchers in its use with MTTB. For this reason, further investigation has been discontinued for this instrument. Unfortunately, the improvisations used for this thesis did contain the use of the djembe (moreover in chapter 6.5).

4.6 Brief theoretical framework

It is common that case studies regarding music therapy take music into account, through for example descriptive reports or, in the case of receptive music therapy, through excerpts. Music therapists with different theoretical backgrounds explain the role and meaning of music in different ways. In general it can be said that music is seen as meaningful by being a facilitative component to the therapeutic process and a source of healing in the music therapy context. Specifically, music is seen as a form of communication of emotions (Gfeller, in Unkefer and Thaut, 2005). Music made by the therapist and one or more clients have a certain goal.

In essence, the goals in music therapy are not focussed on aesthetic, musical ideals. They rather serve the possibility to search, create and reflect meaningful events. Especially, music is "(…) a unique means of self-expression and communication" (Bonde et al., 2002, p. 36). Away from music therapy, the theory of autonomy states that music does not have any other meaning outside the specific aesthetic process of the musical event. According to the theory of heteronomy, music represents, expresses or symbolizes phenomena closely related to the people that make it. Bonde et al. (2002) reports the expressionist position as a compromise between the two earlier mentioned theories. Both qualities are present in music and support each other when one tries to make meaning (Bonde et al., 2002, p. 37).

There are many assumptions to be found regarding the meaning and role of music. Therefore, I will introduce a brief theoretical framework, through which will direct my analysis from the end of analysis process of the second selections and on regarding the third selections. In this

way I will improve the contextualization of the findings in the theoretical assumptions and scientific knowledge and reaching for a more satisfying quality in the discussion of the thesis. Specifically, the symbolic terminology will be matched with the content of the musical features that have been extracted through MTTB. Furthermore, the acoustic cues that have been identified will be analyzed and categorized according to the characteristics (similar explanation), reliability (strong/weak related to the current process), and validity (trustworthy generalize in certain populations). After that, they will be related to (the content of) the musical features that have been extracted through MTTB.

4.6.1 Symbolic meaning, a psychoanalytic perspective

Bruscia (1987) proposes a psychoanalytic perspective on musical parameters. The rhythmic components, like pulse, meter, patterns are considered manifestations of instinctual energy. Tonal components, like melody, modality, harmony and tonality are needed to express specific emotions. Other musical parameters that can hold important information are phrasing, volume, timbre, texture and programs (moreover in chapter 2.7.4). The theory has not been proven by research, but it has been described specifically for musical situations that have a therapeutic goal. The perspective by Bruscia (1987) is highly suitable to use when making sense of music therapy improvisations.

The symbolic meaning of the musical parameters is interesting, because the observations and reflections of both the therapist and client were of a highly symbolic nature. The content was saved in a set of notes made by the therapist after the sessions. Both the client and the therapist have described what they were experiencing during the musical improvisation. Symbolic analogies related to qualities that are specifically occurring in the music are not easily related to concrete musical features, like volume and tempo. Moreover, the musical components, as described by Bruscia (1987), do not match the musical features extracted through MTTB very well. Namely, Bruscia (1987) describes musical qualities which entail several musical parameters in terms of MTTB. Erkkilä et al. (unpublished manuscript) recognize the limitations of computational feature extraction.

> "It is hard to teach a computer understanding what is melody, or phrase, or accompaniment, within musical texture consisting of various overlapping musical events" (Erkkilä, Ala Ruona, & Lartillot, unpublished manuscript)

Connecting basic level musical components to the musical features that have been extracted in MTTB should be possible, though the connections are not impassable. There are some musical components described by Bruscia (1987), that will be left out of the comparison entirely. To mention are meter, pitch, melody, harmony, tonality, phrasing, timbre, texture and programs. These components are to complex or simply absent in the current analysis. The basic level components that could be compatible are rhythmic figures or "patterns," volume, pulse, accents and tempo. The terminology of the musical components will be related to the musical parameters in the following paragraph, based on only the following speculations.

Density and M duration

The MTTB features density (amount of notes) and M duration (length of notes) could be related to the musical component 'rhythmic figures.' Bruscia (1987) explained rhythmic figures or "patterns" as contrasts in significance (accent) and value (duration) that occur with a certain direction (phrase). The significance of the notes however is not part of these features. In MTTB the M velocity is a capture of the significance of the notes. Furthermore, musical patterns are not captured as such by MTTB, because the visualisation does not register the actual notes that are played. The symbolic meaning of rhythmic patterns has been described by Bruscia (1987) as a "ground that holds, supports, controls and equalizes energy and drives" (p. 451). Density and M duration can be seen as such and could be described in terms of intensity of energy and drive, but also in terms of how constant or waving the course over time is.

M velocity

The M velocity feature is extracted in MTTB by measurement of the strength in the onset of one hit on the keyboard. This feature could be related to the musical component volume. Bruscia (1987) described volume as "intensity and amount of sound" (p. 452). The symbolic meaning points towards "force, power, strength, size and commitment" (Bruscia, 1987, p. 452). In my opinion, the only discrepancy in the extraction through MTTB is that it is only measuring the onset of the note. The musical component could also imply the continuation of a note, or an increase of volume when the onset has already passed.

Pulse clarity

The MTTB feature extraction of pulse clarity entails a process of measuring "Gaussian kernels" (Toiviainen and Snyder, 2003; in Luck et al., 2006, p. 38). The result of the pulsation function was calculated for positions in a sliding window, which resulted in a pulsation diagram (moreover in chapter 4.4). Pulse clarity is a function of the pulsation diagram. The maximum values of each column in the pulsation diagram were taken. Bruscia (1987) described pulse as the division of time in equal parts and it's symbolic meaning points to a guard against fear, sources of anxiety or over-stimulation. The feature pulse clarity is indeed extracted in terms of how music relates to a sense of pulse over time. A stable pulse clarity could be interpreted as a guard and an unstable, or interchanging pulse clarity could point towards playfulness or free exploration.

Articulation

In MTTB the amount of time intervals between notes has been interpreted in terms of staccato and legato playing, which refers to the articulation of playing. The musical component that is comparable is accent. The definition by Bruscia (1987) entails the organisation of tones in power and length. In symbolic language Bruscia describes them as "signals of revolutionary change or rebellion against authority" (1987, p. 454). In the current improvisations a articulation (staccato) could refer to signals of change, whereas a low articulation (legato) could refer to submissive replies.

Tempo

As a MTTB feature, tempo is collected as values that are associated with the maximum values in the pulsation diagram. Bruscia (1987) also described pulse, by which he simply referred to the speed of the client's music, as a "gauge of energy, signalling the need to be held up by a ground" (p. 455). When the tempo is high in the current improvisations, this could be interpreted in terms of energy.

4.6.2 Severity of depression

In a recent study of Mundt et al. (2012), 105 adults with major depression were included in a double-blind RCT to repeat the outcome of a previous study that investigated vocal acoustics

as 'biomarkers' for depression severity. The outcome yields significant reliability for detecting speech pattern changes predicting course of depression. Namely, the speech pause time, variable pause lengths were longer in more severely depressed patients and the speaking rate was lower. Yang et al. (2013) conducted recently a study on vocal prosody, where the hypotheses were supported by the outcome. Listeners were able to detect the severity of the depressions (mild, moderate, severe) after listening to the recordings containing vocal material of the depressed participants in this study. Vocal timing (SPs) correlated positively and most strongly among other aspects of the study. SPs refers to the pauses between utterances. As the depression decreased, the SPs became shorter and less variable for both the participant and the interviewer (moreover in chapter 2.7.5).

TABLE 6. Vocal cues recognized in the study by Juslin and Laukka (2003) and related to severity in depression in the studies by Mundt et al. (2012) and Yang et al. (2013) in terms of terminology.

	Amount pauses	Length pauses	Speaking rate	Duration pauses	F_0
Mundt et al. (2012)	Speech pause time	Variable pause lengths	Speaking rate		
Juslin and Laukka (2003)	Temporal aspects: Pauses. Amount of silence in speech. Pauses are usually measured as number or duration of silences in the acoustic waveform (Scherer, 1982).		Temporal aspects; Speech rate. Velocity of speech. The rate can be measured as overall duration or as units per duration (e.g., words per min). It may include either complete utterances or only the voiced segments of speech (Scherer, 1982).		
Yang et al. (2013)	SPs. "pause duration between the end of one speaker's utterance and the start of an utterance by the other. SPs were identified from the matrix output of Sphinx. So that back channel utterances would not confound SPs, overlapping voiced frames were excluded. SPs were aggregated to yield M duration and coefficient of variation (CV) for both participants and interviewers. The CV (_=_) is the ratio of standard deviation to the mean. It reflects the variability of SPs when the effect of mean differences in duration is removed."				F_0. "Vocal fundamental frequency. (…) using the autocorrelation function in Praat [5] using a window shift of 10 ms. As with SP, we computed mean and CV of F0 for both participants"

Note. In the study by Mundt et al. no descriptions were included concerning the generation of the codes. For the codes by Juslin and Laukka, the first term is an umbrella term, used to group codes around the same meaning. The second term is the name of the specific cue and the third term is the correlating perceived code. Last, the definition and measurement has been cited.

In general, the MTTB related features can be compared to the codes that have been used by the above mentioned researchers. The vocal cues that have been categorized in the systematic review by Juslin and Laukka (2003) make this possible, because they correlated musical performance features to vocal cues (moreover in chapter 2.7.3). In order to answer question

three in terms of severity of depression, two steps have to be taken. Table 6 presents the vocal cues by Mundt et al. (2012) and Yang et al. (2013) in relation to the vocal cues by Juslin and Laukka (2003). In the table is visualized through the color grey that the terminology of the study by Yang et al. (2013) does not relate to the cues from the study by Juslin and Laukka (2003).

Consequently, the outcome regarding 'speech pause time' and 'speaking rate' of this study will form a basis for this topic in the discussion of this thesis regarding the severity of depression. The vocal and musical cues in the study by Juslin and Laukka (2003) correlate in terms of temporal aspects. Table 7 presents the temporal aspects of the vocal cues together with the corresponding MTTB related features. In other words, the study by Mundt et al. (2012) revealed that increased 'speech pause time' and a 'lower speech rate' were related with higher levels of depression. Thus, the discussion regarding the severity of depression will be focussed on increased articulation and tempo.

TABLE 7. Vocal cues linked to MTTB related features.

Mundt et al.	MTTB features
Speech pause time	Articulation
Speaking rate	Tempo

In this table can be observed that the temporal aspects relate to the MTTB related features 'Articulation' and 'Tempo.' The analysis of these features will be discussed separately in chapter 5 related to the severity of the depression.

4.6.3 Analyzing emotional content

Juslin and Laukka (2003) have systematically reviewed and correlated the results of the studies on the communication of emotions in the context of both vocal expression and music performance. They found similarities in the precision between the two fields. First, the emotions communicated to listeners were similarly precise. Specifically, anger and sadness were most often accurately identified among all five basic emotions (anger, sadness, happiness, fear and tenderness). Second, there appeared to be specific patterns within each emotion, which have been explained as a "coding of the communicative process" (Juslin and Laukka, 2003, p. 801). The generation, analysis and discussion of the codes have been

elucidated by the researchers in a great detail (moreover in chapter 2.7.3). Moreover, Juslin and Laukka (2003) described musical cues derived from 41 studies regarding the emotional communication and describing musical patterns for the five basic emotions.

TABLE 8. Musical performance cues that match with MTTB related features.

MTTB Features	Juslin and Laukka
Density	-
M Duration	-
M Pitch	F0 (Pitch)
SD Pitch	F0 variability (Pitch)
M Velocity	Attack (Intensity)
Pulse clarity	-
Articulation	Articulation (Temporal aspects)
Tempo	Tempo (Temporal aspects)

The terminology of all MTTB related features has been matched to the musical cues described by Juslin and Laukka (see also appendix II), which includes the definitions and means of generation of the cues. Table 8 presents a condensed version of the comparisons. Notice that not all MTTB related features were given an explanation, because the study of Juslin and Laukka (2003) included specific musical cues that related to vocal cues. Whereas, the features extracted through MTTB are related to a keyboard instrument.

TABLE 9. Emotional content according to the musical cues that matched with MTTB related features.

	Anger	Fear	Happiness	Sadness	Tenderness
F0 (pitch)	High	High	High	Low	Low
F0 variability (pitch)	Much	Little	Much	Little	Little
Attack (intensity)	Fast	-	Fast	Slow	Slow
Articulation (temp. aspects)	Staccato	Staccato	Staccato	Legato	Legato
Tempo (temporal aspects)	Fast	Fast	Fast	Slow	Slow

Note. The cursive cues have been found to have the most powerful effects on music listener's ratings of emotional content (Juslin, 1997c, 2000; Juslin and Madison, 1999; Lieberman and Michaels, 1962; Scherer and Oshinsky, 1977; in Juslin and Laukka, 2003, p. 797).

The musical cues that have been presented in table 9 are the same cues that matched with the MTTB related musical features. The explanations of the emotional content will be used accordingly. Thus, extra attention when discussing the emotional content, answering the main research question of this thesis, will be given to 'M Pitch,' 'SD Pitch,' 'M Velocity,' 'Articulation' and 'Tempo.'

5 FINDINGS AND THE PROCESS

This chapter presents the background information, a description of the analysis process and the findings. The process of making decisions regarding, for example the selection of the data and the style of analysis could function as inspiration in itself for future Music therapy toolbox (MTTB). The findings have been presented to support answering the research questions and the answer to the main research question lies in this chapter. However, for the contextualization of the findings I refer the reader to chapter six.

5.1 General information and the selection process

5.1.1 Background information

The overall data was in the different forms available and accessible through the system and the private memory of professor M. Punkanen. The case concerned a woman and the outcome in terms of recovery was considered successful. The tree test points of the MADRS scores confirmed this. The cut-off scores entailed up to 19, mild; 20–29, moderate; and 30 or greater, severe depression. For this individual case test point one revealed a score of 31, a severe depression. Test point two revealed a score of 15, mild depression and the third test point revealed a score of 14 points, mild depression. The first improvisation is derived from session 3, which was held on the 11th of march 2009 at 17:52. The second improvisation is derived from session 17, which was held on the 27th of may 2009 at 17:53.

5.1.2 Therapist's notes

There were short notes made after each therapy session. The translations of the descriptions were made by M. Punkanen:

> "Improvisation 1 (from session 3)
> Theme for the improvisation was "I in interaction" and the notes from this improvisation are:
> We started the improvisation with short scanning of thoughts, emotions and sensations with eyes closed. Is it possible to break structures that are familiar and safe for you? If you do that what will happen? Client: The music sounded mainly sad. I tried also to use some power in my playing and get rid of the usual soft and flat expression because it is boring. I notice that I want to keep things harmonic and without any contradiction. But at the same time I want some changes. As a therapist I felt that client avoided to face and express the feelings of anger. But she was bale to try out something that wasn't so typical for her.
>
> Improvisation 2 (from session 17)
> Theme for the improvisation was "contradictory emotions" and the notes from this improvisation are:

We started the improvisation with short scanning of thoughts, emotions and sensations with eyes closed. This improvisation had lot of variations and changes. Client: the variety and flow of improvisation expressed the qualities of my life. I want changes and I want to do things fully. It is interesting that if you really want to play in harmonic way with other person it will lead to conflicts, but if you just play how you want it feels and sounds good to me. That is also true for my relationship with my husband. I want to be able to express myself in honest way. As a therapist I felt that client tries to get in touch with her different emotions and express those through music and was also able to do it." (translation by Punkanen, 2014)

5.1.3 The selection process

The selection process has been conducted according to the principle of microanalysis, while using MTTB. In total three selections have been made. The episodes have been used to analyze the severity of depression and the emotional content. The events have been used to analyze the relationship between client and the therapist. The moment-by-moment experienced changes have been used to make meaning in terms of emotional content and symbolic content. Lastly, the body language has been analyzed as well, which contributed to the understanding of the circumstances.

Episodes (see also figure 1, p. 69)

As described in chapter 4 regarding the principle of micro analysis, the largest amount of data should be coming from one session. Therefore, I chose not to investigate the whole case, but to perform micro analysis on selections of one case and an episode that represents the expression of anger after a discussion regarding the depression study. Two improvisations were chosen from different sessions (see also figure 1, p. 68). The selection is based on both the insight regarding the background information of the client and the therapy notes of the therapist. Furthermore, two improvisations have been purposefully selected from the beginning (not the first) and the end (not the last) sessions in the process. The videos of the musical interactions were provided for analysis to provide the complementary auditory material as well as a presentation of the episode as a whole. Getting familiar with the MTTB graphs as data was easy by getting started with selecting and analyzing the most outstanding characteristics of the improvisations with the video material as a reference.

Events (see also figure 1, p. 69)

I started to analyze the MTTB graph and watching the video and I observed that the improvisations make a wave movement regarding different musical features, body

movements, facial expressions and instruments. Furthermore, session 17 it is not (completely) visual in the MTTB transcription. I had to rely on the video, because there has been expression visual in the jembé parts and mostly by the client. Keeping in mind that I was looking at musical features that are expressive of the emotion anger, I made some (preliminary) assumptions about 'expression' for both of the videos.

- Expression does not begin in one moment, but it has a smaller or bigger build up.
- Expression does not stop abruptly, it has a "fading out" period.
- Expression is not clearly done only by the client, but more a teamwork between the client and the therapist. They influence each other's expression and the length of the moment of expression.

The second selections in the videos were labeled and rated on the point where the client starts expressing. I proposed a moment where the client makes a clear change in her use of musical features. I looked at both the body/facial expressions and the music as a whole. I have observed for the beginning of both improvisations that...

- The therapist has a wait and see attitude in the beginning.
- The client initiated using an expressive musical feature in both improvisations after more or less 4 minutes (this initiative resulted clearly in a first expressive event.).

The only other event for session 3 I made was also because of the behavior of the client. In the moment that felt like the improvisation could have stopped she started to use expressive features again. For session 3 the events seem to be clear then for session 17. For session 17 I found it difficult to decide where a event should begin, because I couldn't point out the end of the previous event, just like with session 3. Still, I tried to make a rough sketch.

I revisited the events for session 17, by watching the video again. I changed my approach fort deciding the divisions of the sequence of expressive moments. I decided to point out 'Explosion moments' as the client's music seemed to behave in a waving manner (see also graph 1). The result contains 15 moments that are different in intensity and length. I decided that these were too short and there were too much to make the "explosion moments" as a basis for the events.

GRAPH 1. 'Exploding Moments' in improvisation from session 17. The X-axis represents moments of onset to offset of the moments and the Y-axis represents the length of the moments.
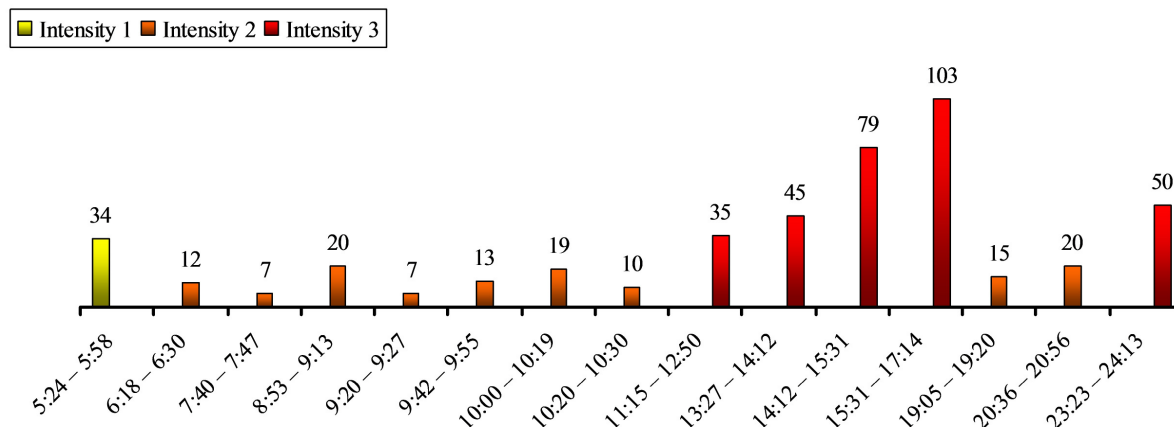
I started to make more preliminary conclusions and now not only about expression, but more specifically the expression of anger.

- The beginning moments of expression of anger should have to do with an increase of tempo, volume, amount of notes and/or use of dissonant notes (moreover in chapter 4.6.3).
- The initiatives of the client are seen as most important

I revisited the events again and confirmed that for session 3 the events began with a musical initiative of the client. For session 17 I combined the "explosion moments" with the rough events that I had made earlier. I felt that my previous observations combined with my new assumptions about the expression of anger made it more clear to point out where events could begin. However, I could not make out the end points of the events without making other and more suggestive assumptions, so I haven't done that.

When I revisited the events again I noticed that I had only divided the improvisations in different parts instead of choosing different moments. This became a fact, because I postponed the decision about where the endings were supposed to be. Namely, I had to make the assumption where the cut off point should be for the improvisations containing emotional arousing content. I did not know where the music stopped representing emotional arousing content for the client. In other words, I believed I could not know how the client felt after an 'exploding' moment or a moment where she had played with increased values of tempo, volume, amount of notes and/or dissonant notes. It could be that the notes played after are

also filled with anger for the client. Furthermore, it was not my intention to decide which part of the improvisation is most important. It was merely my intention to notate what the characteristics are of the improvisation.

I compared the chosen events and the parts that I had chosen earlier in the MTTB graph for session 17. I think that the first findings about 'the most outstanding characteristics did not contain all outstanding characteristics, but naturally, there was information missing (the jembé). Lastly, I checked whether the logic behind the events is the same for all events:

- The client takes initiative
- A musical parameter increases for the client

Summarizing, the only parts that have fallen away are the beginning parts up to the moments that some increases different musical features have been initiated by the client. I have made some assumptions to be able to continue. The process of choosing events had become a process of dividing the improvisations into different events. The events are based on the behavior of the client. Moreover, the client shows initiative and increases her use of dissonant notes, volume, amount of notes and/or tempo.

Moment-by-moment experienced changes (see also figure 1, p. 69)

For the third selection procedure not only the MTTB graphs were used, but also the body expression matrixes and the video material as a reference. In addition, theoretical assumptions and scientific significant results have been included in the analysis through a brief theoretical framework (moreover in chapter 4.6). The short duration of this moment will allow for the analysis on the basis of emotions and symbolism. Recapping, all MTTB related features were matched with symbolic components. Thus, all features were important. Choosing moment-by-moment experienced changes was sensibly done. The graphs of in total six events in the improvisations were colourful from the previous analysis and the movements of the lines started to become familiar. The moment by moment experience that might reveal something about emotional and/or symbolic content could be the first moment that the improvisation started to increase in intensity on different parameters. For both improvisations this occurred at the same time and the length of the moment was also similar.

Body language

The body expression is an important part of the improvisation. I have reduced the body expression into codes that seemed logical and presented them in a Microsoft excel spread sheet (see also appendix XIII). The codes were open and descriptive and have been observed based on different body parts at a time. Naming the body parts first and analyzing each body separately made it fairly easy to analyze and name just the movements. The video was played in fast-forward mode and stopped every 30 seconds. The most prominent behaviours happened in the head and arms. However, the feet and facial expression were almost invisible due to the view angle of the video.

5.2   Outstanding characteristics

In order to answer the main research question, the improvisation has been investigated through the use of MTTB. The analysis of the characteristics of the improvisations have taken place on the microanalysis level of the episode and event (see also figure 1, p 69). The graphs representing the episodes and events can be reviewed in the appendix (see also appendix III – X). The body expression has been elaborated upon in this chapter as the body expression is viewed upon as part of the improvisations (see also appendix XIII and XIV).

5.2.1 Episodes

The following features were taken into account when looking at the data.   → Density
→ SD pitch   → M velocity   → Rhythmic clarity → Minor   → Duration
→ Articulation   → Dissonance   → M pitch   → Major   → Tonality
The descriptions have been made quite accurately with the help of a pencil and a ruler. In general only elements that were clearly visual in the graphs were notated. In order to make it possible to develop descriptions for the movement of the features three outstanding moments have been chosen and the characteristics have been described accordingly. For the MTTB graphs increases and decreases were clearly present in the different musical features. Another feature of MTTB is a display of the keyboard as a whole (see also figure 9). Figure 3 and 4 exemplify in- and decreases in the MTTB graphs. Figure 5 is an example of an occasion where the client and therapist's lines take different direction over time. Figures 6 an 7 exemplify spikes, both up and down. In figure 8 a sequence is exemplified.
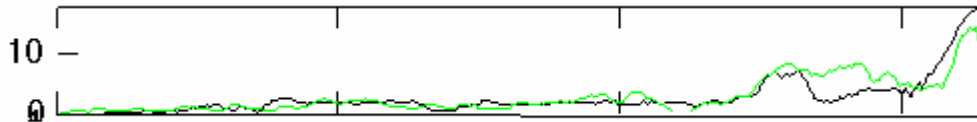
FIGURE 3. Example of an 'increase' in density, from the MTTB graph of session 3. Green = client, black = therapist (See also appendix III).
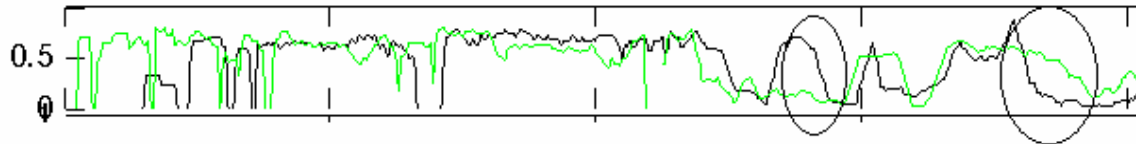
FIGURE 4. Example of a 'decrease' in articulation, from the MTTB graph of session 3. Green = client, black = therapist (See also appendix III).
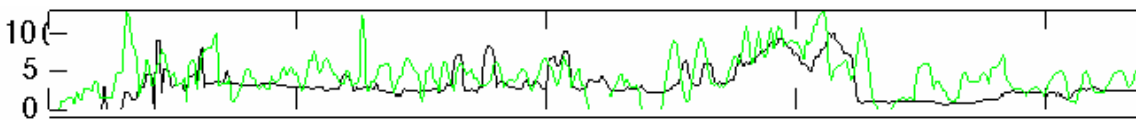
FIGURE 5. Example of 'differ' in SD pitch, from the MTTB graph of session 3. Green = client, black = therapist (See also appendix III).
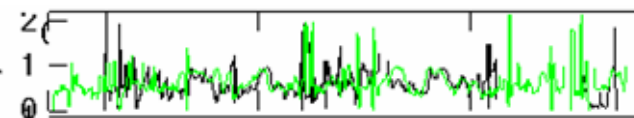
FIGURE 6. Example of a 'spike UP' in rhythmic clarity, from the MTTB graph of session 17. Green = client, black = therapist (See also appendix IV).
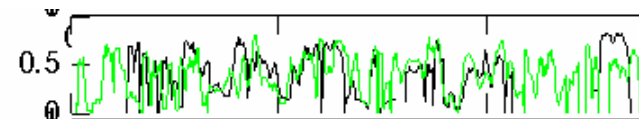
FIGURE 7. Example of a 'spike DOWN' in articulation, from the MTTB graph of session 17. Green = client, black = therapist (See also appendix IV).
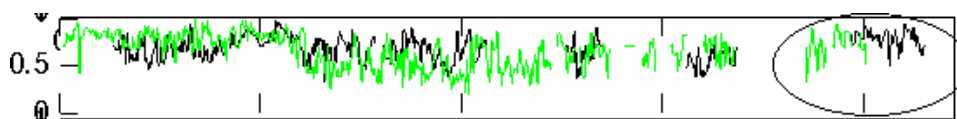
FIGURE 8. Example of a 'sequence' in tonality, from the MTTB graph of session 17. Green = client, black = therapist (See also appendix IV).
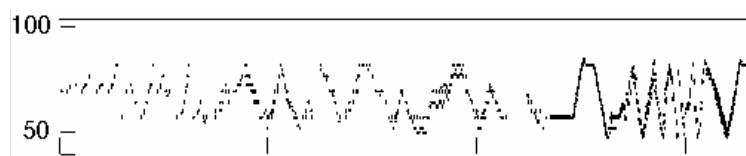
FIGURE 9. Example of a 'zigzag pattern' in the keyboard display of session 3 (See also appendix III).

Session 3

The keyboard display feature of MTTB revealed for session 3 that the client's display seems like a zigzag pattern, but at the end there seems more low notes used. The therapist seems like a smaller zigzag and at the half of the improvisation mainly low notes are used. The steady use of lower notes was initiated by the therapist. At the end a display, the use of possibly the whole keyboard is visual. Table 10 summarizes the characteristics for each outstanding moment without differentiating between the therapist and the client.

TABLE 10. Summary of the characteristics in terms of increase, decrease and/or differ (see also figure 3, 4 and 5), per feature for three moments in the episode from session 3.

	0 - 105	200 – 400	600 - 780
Density		differ and increase	differ
Duration		decrease cl, decrease	increase
M Pitch		differ	differ
St. Dev. Pitch	differ	differ	differ
M velocity	differ	increase, differ	
Rhythmic clarity	spike UP	small spike UP, increase	
Tonality	differ	decrease	
Major		decrease	
Minor	differ	decrease	
Articulation	spike DOWN	spike DOWN	spike DOWN
Dissonance		small increase	

Session 17

The keyboard display representing the client in session 17 looks like a scattered zigzag. It touches the lower outer notes, but not the highest notes available. There seems to be a lot of sequencing going on when having a closer look at the graphs. The beginning of the client looks more or less the same as the ending. The pitch is equally high and the movement towards it seems the same. For the therapist I could say more or less the same thing (see also appendix IV). The keyboard display in the MTTB graph shows a thicker line in both the therapist and the client. The therapist and the client are in closely related interplay. Both the client and therapist use the mallet kit. Table 11 summarizes the characteristics for each outstanding moment without differentiating between the therapist and the client.

TABLE 11. Summary of the characteristics in terms of increase, decrease, differ and/or sequence (see also figure 3, 4, 5 and 8), per feature for three moments in the episode from session 17.

	350 - 410	740 - 860	1350 - 1490
Density	increase	sequence	differ, increase
Duration	decrease	sequence	decrease, differ
M Pitch		sequence	small differ
St. Dev. Pitch		sequence	small spike UP
M velocity		sequence, increase	increase
Rhythmic clarity		sequence, spike UP	(small) spike UP
Tonality		sequence	spike DOWN
Major		sequence, spike UP	spike UP
Minor		sequence, spike UP	spike DOWN
Articulation		sequence	differ
Dissonance		sequence, spike UP	large spike UP

5.2.2 Events

A new set of MTTB graphs has been generated. The following features were taken into account when looking at the data.

→ Density → M duration → M pitch → SD pitch

→ M velocity → Pulse clarity → Articulation → Tempo

→ Synchronisation → Synchronisation tempo

The horizontal axis with the time has been left out these graphs and also the keyboard display is not well visualized (see also appendixes V - X). However, for the purpose of investigating the movement of the lines and the relationship between the lines this is not necessary. The content of the tables below have been explained by analyzing the MTTB graphs alongside the video material.

A few terms regarding the relation between the lines were generated in the process. I first identified the overall movement of the lines and distinguished what the overall movements of the client and the therapist were (see also table 12). After that I colored the spaces between the client and the therapist's lines grey in order to make the differences more outstanding (see also figure 10). I continued the process with describing the differences and similarities below. After that I colored three types of behavior. The first behavior, where the client and therapist's lines were in the first case 'pulling together' (see also figure 11). The second behavior, where the client and therapist's lines seemed to make a 'similar movement' (see also figure 12). The third behavior where the client and therapist's lines seemed to make a 'mirror movement' (see also figure 13).

For session 17 I began to analyze the events of the improvisation in the same way as I had described for session 3. Before I could continue I had to acknowledge the empty spaces in the MTTB graphs. In this improvisation the acoustic drum had been used and the digital audio of this drum was not integrated in this MIDI based MTTB graph. Thus I made vertical lines in order to see clearly where there was information "missing". Furthermore, I color coded the events in order to see more easily who was still playing the MIDI instruments (see also figure 14). The video source confirmed that the improvisations did not have silences. Therefore, one can conclude that when the line is missing from the MTTB graph, the improvisation takes place on the audio instrument (see also appendixes VIII - X).
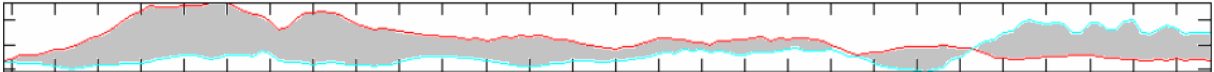
FIGURE 10. Example of the spaces between the lines colored grey in M pitch, from the MTTB graph of event 2. Blue = client, red = therapist (see also appendix VI).
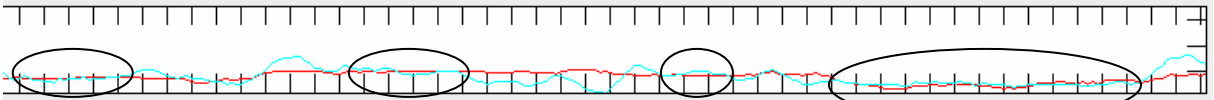
FIGURE 11. Example of the 'pulling together' lines in density, from the MTTB graph of session 3, event 1. Blue = client, red = therapist (see also appendix V)
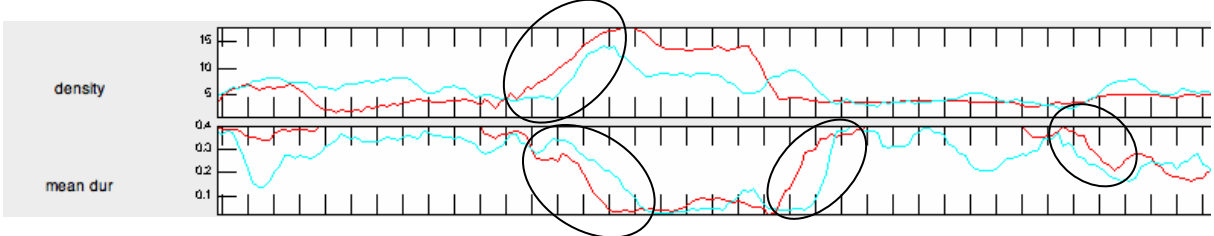
FIGURE 12. Example of a 'similar movement,' in density and M duration, from the MTTB graph of session 3, event 1. Blue = client, red = therapist (see also appendix V).
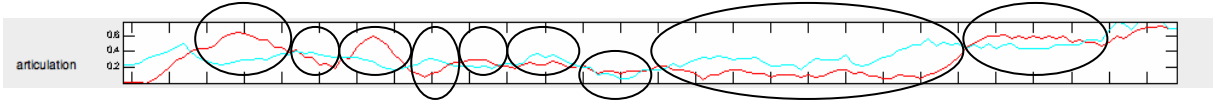
FIGURE 13. Example of a 'mirror movement,' in articulation, from the MTTB graph of session 3, event 2. Blue = client, red = therapist (see also appendix VI).
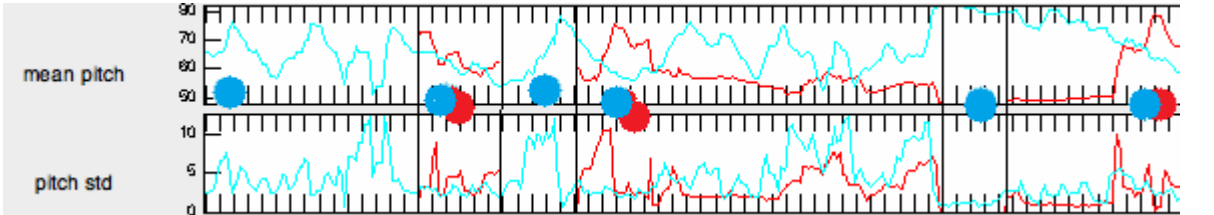
FIGURE 14. Example of 'vertical lines' and 'color codes' in M pitch and SD pitch, from the MTTB graph of session 17, event 4. Blue = client, red = therapist (see also appendix X).

Session 3

An overview of the main characteristics regarding the different features for both events of the improvisations is presented in table 12. This table allows comparison between the two events of the same improvisation. Specifically, noteworthy is that the development of only the lines in the features M pitch and SD pitch were different between the two events. This is not surprising, because the selection of the events have been done based on the moments where the client showed an expressive initiative.

TABLE 12. Overview of the movement of the musical features from events 1 and 2 in session 3.

	event 1	event 2
Density	**Client is higher**	**Client Higher**
M duration	**Client is lower**	**Client Lower**
M pitch	Client wave Therapist Stable	Client Lower but higher at the end
SD pitch	Client wave Therapist Stable	Interchanging
M velocity	**Client higher in one big part after that almost only Lower**	Interchanging **from halfway Client Lower**
Pulse clarity	**Interchanging**	**Interchanging** first part Client Higher last part Client Lower
Articulation	**Interchanging**	**Interchanging** Client Higher
Tempo	**Therapist is mostly High**	**Therapist Mostly High**

Note. The similarities regarding the two events have been presented bold

For session 3 was observed that the therapist and client's lines for some features, like M and SD pitch and tempo moved along a different way. The therapist had adopted a higher tempo and a more stable use of M and SD pitch. In the features density, M duration, M velocity, and articulation the lines behaved quite similar.

Session 17

I described the differences and similarities per feature below. I have observed the most outstanding characteristics per feature (see also table 13). Moreover, this table that contains material from different events. However, event 2 and 3 have been left out this event, because there was too much missing data to be able to say something is such general terms. Specifically, noteworthy is that the development of only the lines in the features M pitch and SD pitch were different between the two events. This is not surprising, because the selection

of the events have been done based on the moments where the client showed an expressive initiative. Following I analyzed the parts where the lines of the client and therapist seemed to be 'pulling together' or making a 'similar movement or a 'mirror movement.' I continued describing these behaviors below per event.

TABLE 13. Overview of the movement of the musical features from event 1 and 4 in session 17.

	event 1	event 4
Density	**Interchanging** **Overall Low**	**Interchanging** First part Waving **Second part Low**
M duration	**Overall High**	**Overall High** Therapist has greater peaks down
M pitch	Interchanging Latter part Client Higher	Waving, but mostly the Client
SD pitch	Interchanging Latter part overall Low	Interchanging Waving
M velocity	**First three quarters Waving** **Last quarter Low** **Therapist Higher**	**First part Waving** **Second part Low** **Overall Therapist is Higher**
Pulse clarity	**Interchanging** **Overall Low**	**Interchanging** **Overall Low** with Peaks Up
Articulation	**Interchanging** **Waving**	**Interchanging** **Heavily waving** with Peaks Down
Tempo	**Interchanging** **Waving**	**Interchanging** **Heavily Waving**

Note. The similarities regarding the two events have been presented bold.

For session 17 the lines of all features moved quite similar. Another interesting difference was that the moments marked as pulling together for session 3 were spread out and short. Only a few were marked for duration, M pitch, SD pitch, and articulation. More were marked in M velocity, pulse clarity and tempo. For session 17 the analysis revealed that all lines were representing actions like pulling together and similar movements.

5.3   Why the moment-by-moment experienced changes occur

The answer for research question two will be approached through the moment-by-moment experienced change MTTB graphs (see also appendix XI and XII) will by analyzed through the previous developed ten codes that have been created during the previous analysis. Including;   → Increase   → Decrease   → Differ
→ Mirror movement   → Similar movement   → Spike up   → Sequence

→ Space between the lines   → Pulling together   → Spike down

The content has been focussed on the parameters that were relevant for the different topics in the brief theoretical framework (moreover in chapter 4.6). The analysis was partly focussed on the symbolic meaning of the moment-by-moment experienced change and on the emotional content. For each moment-by-moment experienced change four segments of the body language have been analyzed. The intervals between the segments are thirty seconds.

5.3.1 Emotional content

The moment-by-moment experienced changes have been analyzed regarding the emotional content. Only 'M pitch,' 'SD pitch,' 'M velocity,' 'articulation' and 'tempo' appeared to be interesting. The features have been described below per session.

Session 3

Visual is that the M pitch feature is high for the therapist in the beginning, then the client also becomes high immediately. The client makes a waving movement becomes high again at the end, whereas the therapist becomes low in the beginning and stays low in a more steadily tendency. The SD pitch feature for the therapist becomes higher in the beginning, is high in the middle and becomes low at the end. For the therapist the SD pitch feature has a more waving pattern, but overall makes the same movement as the therapist. The M velocity feature characterized by more similar and pulling lines movements. The therapist and client's lines stay closer together. However, overall the client had a higher velocity then the therapist. The M velocity feature becomes higher in the beginning, is high in the middle and becomes low at the end. The articulation feature for the therapist shows a heavily waving pattern; high in the beginning, then to low and then high again. In the beginning of the middle high, then low, then high and then low again. The end of the moment is low and then high again. For the client the feature stays low in the beginning, becomes high in the end of the middle, but becomes low again and becomes high at the en again. Last, the tempo feature for both the client and the therapist overall stays low. At the end of the beginning, the therapist has two spikes up. At the end of the whole moment, the therapist's line becomes high, but the client stays longer low and becomes only high at the far end.

Session 17

Visual is that the M pitch feature makes a similar movement. Thus, both the therapist and the client are low at the beginning, make an upward movement in the middle and are high at the end of the moment. The SD pitch stays low over the span of the moment. The therapist becomes mildly higher in the middle. The M velocity feature reveals a lot of similar movements and overall the therapist has a higher line than the client. The therapist becomes higher in the beginning and middle and the client becomes higher only in the beginning of the end. Overall, the articulation feature reveals a higher line for the client. Although, the therapist in general waves with the movement of the client. The tempo feature reveals a quite low image. Both the therapist and the client reveal spikes up and down. For the client is visual in the beginning a spike down and up and in the middle up. For the therapist is visual in the middle a spike up.

TABLE 14. The emotional content and the parameters of the moment-by-moment experienced changes in this thesis have been compared in terms of a match or a mismatch.

	M Pitch	SD Pitch	M Velocity	Articulation	Temp	Total
Anger session 3	√	√	√	X	X	**3**
Anger session 17	√	X	√	√	√	**4**
Fear session 3	√	X	-	X	X	1
Fear session 17	√	√	-	√	√	**4**
Happiness session 3	√	√	√	X	X	**3**
Happiness session 17	√	X	√	√	√	**4**
Sadness session 3	X	X	X	√	√	2
Sadness session 17	X	√	X	X	X	1
Tenderness session 3	X	X	X	√	√	2
Tenderness session 17	X	√	X	X	X	1

Note. √ = match, X = mismatch, - = no reference.

In table 14 the summarized findings (see also table 15, p. 92) have been compared with the parameters describing the emotional content based on 5 basic emotions (see also table 9, p. 76). Summarized, the analysis of the moment-by-moment experienced change in the improvisation from session 3 has generated the highest scores for anger and happiness. For session 17 the highest scores were indicating anger, fear and happiness.

5.3.2 Symbolic meaning

The moment-by-moment experienced changes were investigated on the symbolic meaning. According to the brief theoretical framework (moreover in chapter 4.6) by looking only to the

features density, M duration, M velocity, pulse clarity, articulation and tempo. For both sessions the features have been described and linked to the possible symbolic meaning.

Session 3

The density, M duration and tempo feature were quite stable and moved at the same moments. The density feature moved up at the end of the moment, the M duration feature down and the tempo feature moved up. Symbolically, the ground where the improvisation floats on seems quite stable and the energy increases at the end. The pulse clarity feature of especially the client is quite high and goes down at the end of the moment, pointing towards letting go of this "guard against fear" or "over-stimulation" (Bruscia, 1987, p. 451 – 455). The Articulation feature of the client is mostly low, which indicates a legato playing, but at the end of the moment the client's line goes up. The therapist played already earlier during the moment with a more staccato articulation. Symbolically this could mean that both the therapist and the clients communicate, or give cues that point towards change.

The M pitch feature is quite similar overall the whole moment, which could symbolize an "obsession with a feeling." The client's line waves, which could symbolize that the feelings are "fickle and unstable, or unformed." The SD pitch feature is for both the therapist and the client waving and changing. The end of the moment is very clear; for the SD pitch feature both the therapist and the client have a very low line and for the M pitch feature the client is very high and the therapist very low. However, the symbolic translation of musical components does not specify the value of the height of the pitch, whereas the role of melody is more elaborated upon. Last, regarding the M velocity feature, this seems quite high for the first three-quarters of the moment, but goes down for both the therapist and the client. Mostly for the therapist though. Symbolically this could mean that there was a decreased force or strength in the expressional quality.

Session 17

The density, M duration and tempo feature were quite stable, but the tempo feature of mainly the therapist revealed some spikes up and down. At the end of the moment the density feature increases and the M duration decreases. The tempo feature makes only a small increase, but at the very end of this moment. Symbolically, this could indicate that the ground is stable filled

with security and predictability. The energy increases somewhat at the end. The pulse clarity feature is quite high and remains there for both the therapist and the client. Symbolically, this could point towards an equal amount of energy over this moment and likely guarding against fear or sources of anxiety. The articulation feature reveals big waves and in the beginning only for the client, but after the first twenty seconds the client and the therapist move synchronized, which could symbolize their shared communication of change and rebellion against authority.

The M pitch feature begins quite low and ends up high in one big, synchronized increase. The SD pitch feature reveals for the client a low line, but the therapist waves a little higher. The end of this moment is characterized by a very low SD pitch. Symbolically, it could point towards "an obsession with a feeling" by the client, whereas the therapist's feelings could be more "fickle and unstable, or unformed" (Bruscia, 1987, p. 451 – 455). However, the symbolic translation of musical components does not specify the value of the height of the pitch, whereas the role of melody is more elaborated upon. Last, the M velocity feature reveals a highly waving pattern that happens for the therapist and client in a similar way. At the end the M velocity feature clearly drops down. Symbolically, the power was going up and down and stayed down at the end of the moment.

5.4   How the improvisations differ or agree

To answer research question three, the improvisations have been compared for the moment-by-moment experienced changes. This microanalysis level produced important musical cues and this length was short enough to provide a condensed image of relevant body expressions. The changes have been analyzed regarding the musical communication in terms of taking initiatives. The severity of depression has been analyzed for both moments in terms of musical cues through the brief theoretical framework (moreover in chapter 4.6) and the body expression has been analyzed in both moments for the client separately.

5.4.1 Emotional content

In the brief theoretical framework (moreover chapter 4.6) has been explained that for the emotional content 'M Pitch,' 'SD Pitch,' 'M Velocity,' 'Articulation' and 'Tempo' appeared to be interesting.

TABLE 15. Summary of the characterizing movements of the musical features

	Session 3	Session 17
M Pitch: high/low	high	high
SD Pitch: much/little	much	little
M Velocity: fast/slow	fast	fast
Articulation: staccato/legato	legato	staccato
Temp: fast/slow	slow	fast

In table 15 all the features have been summarized for both sessions in order to make a comparison possible. The features M pitch and M velocity appear to be the same, but the features SD pitch, articulation and tempo appear to be different in the moment-by-moment experienced changes of both sessions.

5.4.2 Severity of depression

Musical cues

Recapping, the MTTB related features 'Articulation' and 'Tempo' appeared to be interesting regarding the severity of the depression. In table 16a and b the features have been presented per session for all microanalysis levels.

TABLE 16a. The features interesting for the severity of depression on three microanalysis levels for session 3

	Articulation	**Tempo**
Episode	Spike down (legato)	-
Event	Interchanging	Therapist high
Moment-by-moment experienced change	Legato	Slow

TABLE 16b. The features interesting for the severity of depression on three microanalysis levels for session 17

	Articulation	**Tempo**
Episode	Sequence, differ	-
Event	Interchanging	Interchanging
Moment-by-moment experienced change	Staccato	Fast

Consequently, different descriptive codes have been used to describe the same codes. For the episode only descriptive codes have been used to summarize the direction of the lines (see

also table 10 and 11, p. 84 and 85). For the event the codes were describing the behaviour of the lines representing the therapist and the client (see also table 12 and 13, p. 87 and 88). Last, for the moment-by-moment experienced change the codes have been described in order to attribute the emotional content (see also table 15, p. 92)

Body expression of the client

Moment-by-moment experienced change session 3: 4:10 – 5:50, total length: 1:40.

In table 17 the client has been presented separately with respect to the different moments in time. The timeline runs horizontally for the different body parts. For the client (see also table 17), the progress over time shows differences in the head, arms and hands. The back and legs did not change. The feet and facial expression were not visual in a clear way.

TABLE 17. The body expression of the client during the 'moment-by-moment experienced change.'

	4:00	4:30	5:00	5:30
Head	**Mildly waving**	**Turned down**	**Turned down**	**Turned down**
Arms	Turning	**Move towards keyboard**	**Move towards keyboard**	**Move towards keyboard**
Hands	Loose grip	**Tighter grip to finger on stick**	**Finger on stick**	**Finger on stick**
Back	Tight to the chair	Tight to the chair	Tight to the chair	Tight to the chair
Legs	Close to each other	Close to each other	Close to each other	Close to each other
Feet	No clear visual	No clear visual	No clear visual	No clear visual
Facial Expression	neutral to concentrated yet no clear visual	neutral to concentrated yet no clear visual	neutral to concentrated yet no clear visual	neutral to concentrated yet no clear visual

Note, the body expressions that showed particular changes on this moment, opposed to the postures that were already existing before this moment have been presented bold.

Moment-by-moment experienced change session 17, 5:00 – 6:30, total length: 1:30

In table 18, the client has been presented separately with respect to the different moments in time. The timeline runs horizontally for the different body parts. For the client (see also table 18) the head, hands and back reveal differences during this time span. The arms and feet did not change and the legs and facial expression were not clearly observed. The back and legs did not change, but the feet and facial expression were not clearly visual.

TABLE 18. The body expression of the client during the 'moment-by-moment experienced change.'

	5:00	5:30	6:00	6:30
Head	**Turned down**	**Turned down**	**Mild turned to side**	**Turned down**
Arms	Loose by the side and moving somehow freely	Loose by the side and moving somehow freely	Loose by the side and moving somehow freely	Loose by the side and moving somehow freely
Hands	**Loose grip**	**Loose grip**	**Loose grip**	**Finger on mallet**
Back	**In the backrest**	**In the backrest**	**Straightened**	**Falls back into chair**
Legs	No clear visual, or action	No clear visual, or action	No clear visual, or action	No clear visual, or action
Feet	On foot on the floor and one on the chair	On foot on the floor and one on the chair	On foot on the floor and one on the chair	On foot on the floor and one on the chair
Facial Expression	Blurry and unclear image	Blurry and unclear image	Blurry and unclear image	Blurry and unclear image

Note, the body expressions that showed particular changes on this moment, opposed to the postures that were already existing before this moment have been presented bold.

5.5   Additional analysis: examples of musical communication

The musical communication has been described through elaborations on three outstanding moments of the features in the episodes of session 3 and 17. For the purpose of investigating differences and agreements between the sessions regarding the musical communication it seems logical to elaborate upon the improvisation in terms of musical features first. Examples of the interpretations of the musical features have been presented in chapter 5.5.1. The description of the musical communication continued with elaborating on the events. Namely, through the musical movements (see also figure 10 – 14, p. 86) of the lines representing the therapist and the client relative to each other. Examples of the interpretation of the movements have been presented in chapter 5.5.2. The musical communication has also been described in terms of initiative, because roles and initiatives are viewed upon as important aspects of therapeutic improvisations. A first example is from session 17, where several instruments have been used and the process of changing instruments resulted in an interesting 'lead-follow' interaction. The second example describes all descriptive codes, like increase or differ, which have been quantified for the moment-by-moment experienced changes (moreover in chapter 5.5.3). Last, through the analysis of the body expression, an example of nonverbal communication has been described (moreover in chapter 5.5.4).

5.5.1 Descriptive musical features in episodes

For example: session 3: 200 – 400 (see also table 10, p. 84, and appendix III)

The increase in density and decrease in duration tells that there was an increasing amount of notes played and naturally the notes became shorter. The pitch featured differed for the therapist and the client as well as the volume. In this part the client was louder than the therapist. The M pitch was higher for the client and the deviation from the mean was greater for the client than the therapist. Regarding pitch, the therapist played along the line of the client, but halfway he adopts a low pitch which removes him in terms of pitch from the client. The spike UP referring to a moment with a pulse is caused by the client. In the total increase the client and therapist literally wave over one another. The tonality as well as the use of major and minor keys fluctuates and in general the value drops. Also in this lines of the therapist and client are intertwined. The client and therapist differ in the use of staccato and legato, but overall they follow the same outline together. There is one point, spike DOWN, where the client is very legato. The client plays a chromatic melodic material, represented by the use of "black keys" is during this period a little higher.

5.5.2 Musical movements in events

For example: session 17, event 4: 19:46 – 30:44, total length: 10:58min (see also table 13, p. 88, and appendix X)

The beginning of event 4 is characterized by the absence of the line of the therapist. Still, most of the graph features both the therapist and the client. The lines behave quite different from each other in mainly the first half of the features M pitch and SD pitch. The client shows a heavily waving pattern, whereas the therapist seems more stable and low. The ending of these features the features M pitch and SD pitch are characterized by 'similar movements' or the lines even 'pulling together.' The features density, M velocity, pulse clarity, articulation and tempo are in general characterized by 'similar movements' and the lines 'pulling together.'

5.5.3 Initiatives in session 17 and in moment-by-moment experienced changes

The musical communication was difficult to read in the episodes and they were left out the analysis of the events for the same reason, with the exception the analysis of the improvisation in session 17. I have analyzed the behaviour of both the therapist and client in

terms of their behaviour of leaving their initial instrument and returning back. The initial instrument is the MIDI instrument mallet kat™. When the line is missing from the MTTB graph, the improvisation takes place on the audio instrument.

All events (1-4) from session 17 (see also appendixes VII – X)

The first two events reveal that the therapist abandoned the MIDI instruments two times before the client did it. The graph of the 2nd event visualizes that the client abandoned the MIDI instruments for the first time only shortly during the second initiative of the therapist. The client came back to the MIDI instrument before the therapist did and after some time the therapist followed consequently. After this behavior the client moved to the audio instrument by herself for a sort time. The therapist proceeded with making the initiative to the audio instrument for the third time and after this and some seconds later the client followed again. After that the client returned to the MIDI instruments three times, whereas the therapist stayed with the audio instrument. When the therapist did return to the MIDI instrument, the client simultaneously started playing the audio instrument again. Though, after a few seconds the client went also back to the MIDI instrument. Following, the therapist made two very short jumps to the audio instrument again and after that the client jumped to the audio instrument as well. Consequently, it left the last seconds of the graph of the 2nd event and first part of the graph of the 3rd event is empty.

The client returned back to the MIDI instrument two times shortly and then the therapist joined, but only for a few moments. The therapist stayed eventually with the MIDI instrument this time, whereas the client went back to the audio instrument and jumped only once very shortly to the MIDI instrument. After some time the therapist also returned the audio instrument, which is visual again by the empty space in the graph. The client returns back for a minute or so to the MIDI instrument, but after that he stays together with the therapist playing the audio instruments for most of the latter half of event 3. More specifically, the third quarter of event 3 turned out empty and in the last quarter of event 3 the client popped up again. The last graph and 4th event begins with a continuation of the client playing a MIDI instrument. After some minutes the line of the therapist appears, but disappears for an equal amount of time as well. After that this graph shows both the therapist and the client, thus playing MIDI instruments, for the bigger amount of time. Near the end of the whole

improvisation the therapist disappears for two short moments more, but then ends the improvisation together with the client on the MIDI instruments.

Moment by moment experienced changes

In order to analyze and allocate initiatives, another code has been generated (see also figure 15). The interpretation regards the timing of the movement between the lines that represent the therapist and the client. In figure 15 is visual that the client initiated an increase, but the therapist initiated the decrease in the feature articulation.
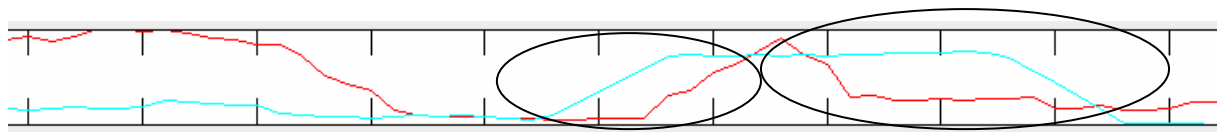
FIGURE 15. Example of 'initiative' in articulation, from the MTTB graph of session 3, moment-by-moment experienced change 1. Blue = client, red = therapist (see also appendix XI).

For example: session 3: 4:10 – 5:50, total length: 1:40. (See also chapter 5.3 and appendix XI)

For this moment there were observed in total 90 increases and 72 decreases. The length and extent of these movements of the lines were not included nor differentiated. Another observation is that the therapist (T) and the client (C) seemed to differ extra for specific parameters and on specific times. The space between the lines of the client and the therapist was quite big for the M pitch feature (C↑) and the tempo feature (T↑) at the end of the moment. At the beginning of the moment the difference was big for the pulse clarity feature (C↑) and the articulation feature (T↑). Primarily in the tempo feature spikes have been observed. Specifically, at the beginning of the moment (T↑), in the middle (T↓) and at the end (C↓). These spikes have been counted with the in- and decreases as well.

No sequences were observed in this moment. Regarding the lines pulling together, this occurs 23 times and mostly in the tempo feature (6) and the pulse clarity feature (5). Similar movements appeared to be quite long. The similar movement was observed mainly at the end of the moment in the density (initiative T), the M duration (initiative T), the M pitch (initiative C), the SD pitch (initiative T), the M velocity (initiative T), the pulse clarity (initiative T) and the articulation features (initiative C). The pulse clarity, articulation and tempo features did not seem to have any mirror movements. In total 15 occurrences of mirror

movements have been observed and mostly in the M pitch, the SD pitch and the M velocity features.

5.5.4 Body expression on segments in events

The full analysis of the body expression has been notated in a Microsoft excel sheet (see also appendix XIII and XIV). Similarities and differences within the commencements of the events were compared for each session (see also table 19a and b). In case of a difference, the direction regarding activity has been given in the form of an arrow. In general the therapist shows a greater activity then the client in terms of body expression. There are also some subjects where the therapist and the client move similar. For example, the hands and facial expression. The following table 19b presents the amount of similarities and differences within the commencement of each event for session 17. In this table is visual that in general the therapist show greater activity then the client. However, opposed to session 3, the client moves the hands more active in segments 1 and 4.

TABLE 19a. Differences between the body expression of
the client and the therapist, for segment 1 and 2, in events of session 3.

	segment 1, at 4:16	segment 2, at 10:10
Head	T↑	T↑
Arms	T↑	T↑
Hands	=	=
Back	T↑	T↑
Legs	T↑	T↑
Feet		
Facial Expression	=	=

Note. For example; T↑ means that the therapist makes more active movement.
= means similar movement.

TABLE 19b. Differences between the body expression of the client and the therapist, for segment 1, 2, 3 and 4 in events of session 17.

	segment 1 4:16	segment 2 8:01	segment 3 11:15	segment 4 19:46
Head	T↑	=	T↑	T↑
Arms	=	T↑	T↑	C↑
Hands	C↑	T↑	T↑	T↑
Back	T↑	T↑	T↑	=
Legs				
Feet			=	
Facial Expression				

Note. For example; T↑ means that the therapist makes more active movement. = means similar movement.

6 DISCUSSION AND CONCLUSION

In this chapter I will highlight the findings in this thesis and discuss them in light of different theoretical topics. This thesis does not provide findings that are relevant for all the mentioned theory. However, discussing the theories in the light of this thesis will reveal indications for future research, conclusions and new questions.

6.1 Characteristics of the musical structures

The first research question of this thesis reads;

> 1 What are the characteristics of the musical structures in the improvisations representing 'the expression of anger' from two sessions of one case in the study by Erkkilä et al. (2011) receiving the intervention improvisational music psychotherapy?

The answer is probably best understood by reading chapter 5.2, as it describes the process and the findings in terms of codes and qualities of different perspectives on the improvisation in detail. Concluding, a few codes that have emerged through the analysis process are presented in table 20, demonstrating aspects of the musical structures.

TABLE 20. Definitions of the codes that derived from the data analysis process

Codes		Explanations
Increase	1	The line goes in a gradual upward movement
Decrease	2	The line goes in a gradual downward movement
Differ	3	Two lines in the display of the same feature are distant from each other
Spike up/down	4	The line makes a sudden (mostly short) down or upwards movement and back
Sequence	5	Two lines in the display of the same feature succeed each other
Space between lines	6	The space in between two lines in the display of the same feature
Pulling together	7	Two lines in the display of the same feature are drafted on top of each other
Similar movement	8	Two lines in the display of the same feature move in a similar direction
Mirror movement	9	Two lines in the display of the same feature move in an opposite direction
Initiative	10	Two lines make the same movement within close range of each other

A few assumptions arose during the selection of events for the second analysis of this improvisation. Namely, expression does not begin or stop abruptly in one moment, but it has a smaller or bigger build up and it has a fading out period. The analysis of the data on all microanalysis levels confirmed this assumption. Furthermore, expression is not only done by the client, but more a teamwork between the client and the therapist. The analysis revealed

that the therapist and client both played throughout the whole improvisations. The players also influence each other's expression, such as the length and the extent of the occurring acoustic cues (moreover in chapter 6.3.3).

The client initiated using increasingly expressive musical features in both improvisations after more or less four minutes. This initiative became an argument for the choice of the events for the second analysis. Based on the observations, the beginning moment of an expressive moment should have to do with an increase of tempo, M velocity, density and/or SD pitch. Moreover, the most apparent movements were analysed regarding the teamwork of the client and the therapist. Specifically, movements that could be important are; 'mirror movement,' 'similar movement,' and a 'pulling movement' (see also table 20). The movements have been observed in terms of initiative, quality and duration. Regarding session 17, there is a lot of information missing in the last four graphs. As described in chapter 4.5, some musical expression has not been captured by the MTTB. Therefore, the analysis will be regarding the mallet kat™.

6.2   Explanations for the moment-by-moment experienced changes

The second research question reads;

> 2   Why did the 'moment-to-moment experiences' occur like they did?

Different levels of meaning are interesting, not only because of conscious feelings, but also un- and preconscious feelings are in the focus of the practice and process of IPMT. It is possible that the client presents the therapist (non)verbally with important feelings or emotions towards an event. It can also happen that important feelings manifest themselves only during and after improvising with the therapist. Not all emotions expressed by the client are expressions that are related in 'the here-and-now'. It can also occur that the client reacts with an emotional behaviour that in fact addresses a pain or anxiety in the past. This many sided psychoanalytical phenomenon is called "transference" (moreover in chapter 6.3.3). Erkkilä (2011) clarifies 'the act of improvisation' further in mental levels of processing (see also table 5, p. 49). Improvisation is thought to exist on the pre-conscious level, even though conscious processes are likely to be always present as well. Erkkilä (2013) explains that the

improvisation should not be thought of as representing either levels of consciousness, but as representing a sliding scale between different levels of consciousness.

Erkkilä (2013) continues that in order to evaluate the clinical relevance of improvisation, a helpful step is to detach the meaning from the musical composition. In other words, to define the meaning of an improvisation in IPMT it could be helpful to adopt a different vocabulary that describes music in clinically relevant terms. The moment-by-moment experienced changes will be discussed in the context of emotional content through the brief theoretical framework. Additionally, the significance of the acoustic cues will be analyzed concerning its symbolic value, based on a chapter regarding "psychoanalytic and existential perspectives" (Bruscia, 1987, p. 450) and a reference to the notes (made by the therapist) regarding the content of the improvisation will be made. Moving forward, the findings of the analysis will also be discusses in the context of emotion regulation, the danger for rumination and psychodynamic principles in IPMT. Last, the topic of depression and anger will be discussed.

6.2.1 Emotional content

The relationship between music and the body has been reviewed by Juslin and Laukka (2003) through comparing vocal cues to musical cues based upon the existence of evidence for the shared neural networks. In this view music communicates, using the same cues as a human voice, the emotional content on the spot. One of the main conclusions of this review yielded that Juslin and Laukka (2003) "speculate that many musical instruments are processed by brain modules as super-expressive voices" (p. 803). They refer to theories that support the notion that the brain does not discriminate the context of the cues, rather merely interpret characteristics and as musical instruments tend to have a larger range than the voice. Thus, the range of emotions that can be communicated or perceived by the brain through musical cues should be immense.

A description of the features related to the musical cues describing the emotional content has been made based on the brief theoretical framework (moreover in chapter 4.6) for the microanalysis level; moment-by-moment experienced change. When discussing the emotional content, the MTTB related features 'M Pitch,' 'SD Pitch,' 'M Velocity,' 'Articulation' and 'Tempo' have been given extra attention. In general the findings of the moment-by-moment

improvisation from session 3 has generated the highest scores for anger and happiness. For session 17 the highest scores were indicating anger, fear and happiness. Both the client and the therapist also verbally expressed after both improvisations that their playing included somehow emotional expression. For session 3, the therapist mentioned in his notes that the client mentioned sadness and he himself mentioned avoiding anger. For session 17, the client mentioned expressing honestly and the therapist mentioned being able to express different emotions successfully. Overall, there is some kind of consensus observable regarding the conclusions about emotional content and especially for session 17. However, when reading the notes of the therapist, the content seems to be also focussed on other subjects than emotions.

6.2.2 Symbolic meaning

Music seems to represent themes and symbolisms. For example, the title of the improvisation in session 3 is called "I in interaction" and the client told the therapist about the improvisation in session 17 that the "variety and flow of the improvisation" had expressed the "qualities of my life." The content of the improvisation has been analyzed on it's symbolic meaning through the brief theoretical framework (moreover in chapter 5.3.2). The next paragraphs summarize the findings and the possible meanings according to Bruscia (1987).

Summarized for the moment-by-moment experienced change in session three, the symbolical meanings include that the ground where the improvisation floats on seems quite stable and the energy increases at the end. Both the therapist and the clients communicate, or give cues that point towards change. Some of the therapist features could symbolize an "obsession with a feeling," whereas the client's feeling seem to be "fickle and unstable, or unformed." The ending could represent letting go of this "guard against fear" or "over-stimulation" and there seemed to be a decreased force or strength in the expressional quality (Bruscia, 1987, p. 451 – 455). When you compare this translation with the notes, which the therapist wrote, it seems that there are some similarities. For example, the therapist described the one feeling (anger) and the client described wanting to change, but having some reservations related to the wish to play harmonic.

Summarized, for the moment-by-moment experienced change in session 17, the symbolical meanings include that the ground is stable filled with security and predictability. An equal amount of energy over this moment and likely guarding against fear or sources of anxiety. The high articulation could symbolize their shared communication of change and rebellion against authority. The pitch feature of the client points towards "an obsession with a feeling," whereas the therapist's feelings could be more "fickle and unstable, or unformed" (Bruscia, 1987, p. 451 – 455). The energy increases somewhat at the end, but the power (M velocity) was going up and down and stayed down at the end of the moment. When this translation is compared with the notes, which the therapist wrote, there are some similarities. For example, the changing in energy, power and articulation has been given a extra-musical meaning by the client. Namely, the client said that the changes expressed the qualities of her life. The therapist said that he felt different emotions coming from the client.

6.2.3 Emotion regulation and rumination

Music takes a prominent role among other tools to regulate mood in everyday life and produces a significant impact on the user. Different emotion regulation tactics have been identified that seem to match with certain working mechanisms as well. Generally, both intrinsic (musical features) as extrinsic (listening context) mechanisms are presumed to be related. Moreover, especially the musical tactic 'music listening' has been investigated by Van Goethem (2011) and she attributes the strategies 'relaxation,' 'distraction,' 'introspection' and 'rational thinking,' as having the highest positive correlations with music as emotion regulation strategy. In general 'venting and 'active coping' appeared as the most successful strategies, followed by 'relaxation,' which differed significantly from 'distraction' and 'introspection' and with a trend from 'rational thinking.' After 'talking to friends/family,' 'music' was the second most used tactic for affect regulation. Interestingly, in this study, the use of music does not seem to match with the most successful coping strategies.

The findings of Van Goethem (2011) were based on 'music listening' in daily life but much of her findings sound like they relate to how music is used in IPMT. Especially, introspection and the stimulation of reflection are cognitive functions that are highly stimulated in IPMT. This study has not produced findings that relate specifically to emotion regulation, because the musical improvisation was not offered to the clients in the context of learning emotion

regulation strategies. However, the implementation of IPMT for people suffering from depression did seem to stimulate important emotion regulation strategies. Namely, IPMT makes successful strategies, like venting possible through musical improvisation in a safe environment.

However, a more thorough search would have to be performed on the topic of rumination, there seems to exist evidence for the danger of rumination in the context of depression. Garrido (2009) points out that studies on music and emotion regulation don't seem to describe, nor differentiate the choosing process for the strategies and the tactics. The writer argues in the light of a literature review on rumination that there are clues that point to the role of depressive states on decision making processes. Miranda and Claes (2009) confirm this suspicion for adolescents. Severe depression in girls correlates positively with 'avoidance/disengagement coping strategies', which have been associated with less successful outcome as an emotion regulation strategy. Moreover, in a study by Ehring et al. (2010), was confirmed that young adults that had suffered a major depressive episode in their past spontaneously inclined towards less effective or emotion dys-regulation techniques.

Regarding IPMT, the therapeutic relationship that is established through musical communication could be of major importance when working on emotion regulation strategies. The support and feedback in the process of emotion regulation can influence the use of strategies. Moreover, the therapist is active and emotionally involved in the process of the client. IPMT, as a psychodynamic therapy, "is a process of real emotional engagement for both parties" (Leiper and Maltby, 2004, p. 71). However, further investigation on the topics regarding the specific benefits of musical communication in IPMT and the role of emotion regulation in IPMT seems suitable. Another direction of future research could be the supportive role of IPMT to the act of using music listening to regulate mood in one's daily life.

6.2.4 Musical preferences and personality

Punkanen (2011) investigated the musical preference of depressed clients that were derived from the population pool in an RCT design study by Erkkilä et al. (2011) regarding IPMT as a psychological treatment for depression. Punkanen (2011) found specifically, energizing,

expressive, and music representative of the emotion anger to be disliked. Rentfrow and Gosling (2003) also investigated the relationship between depression and musical preferences. They have found no significant result in the relationship between emotional stability, depression and self-esteem. Therefore, Rentfrow and Gosling (2003) suggest that emotional states do not have a strong effect on musical preferences. However, as songs undeniably represent various emotional states, further research on the relationship between musical preferences and emotions is advised.

The focus of this thesis lies on the presumed, intrinsic, expressiveness of music and the possibility of expressing emotions through the use of music. This thesis produced no findings that concerned preferences for music, because the improvisations were not selected or rated in terms of musical preference. Although the outcome of the study by Punkanen (2011) also concerned the current client, no results could be reclaimed. Erkkilä et al. (2012) describe that it is possible to capture images, symbols, memories, associations and metaphors that are connected to one's subjective truth (psychopathology) in many ways through the combination of musical improvisation and verbal reflection. Priestley (1994) stated that "music is always an expression of some kind" (Priestley, 1994, p. 136) and music is thought of as being representative of emotions. The improvisations in this study were quantified in terms of their characteristics and attributed with different emotions and symbolic meaning.

Alvin (1975) mentioned that "music is a creation of man – and that is why we can see man in his music" (Alvin, 1975, p. …). Moreover, Rentfrow and Gosling (2003) confirmed the connection between musical preferences and personality, which has been associated with depression (Power, 2009, p. 11; Ainsworth, 2000, p. 29).

> "The hypothesis that there is an association between personality and depression can be traced to antiquity, when Hippocrates, and later Galen argued that particular "humors" were responsible for specific personality types and forms of psychopathology" (Klein, Durbin and Shankman, in Gotlib and Hammen, 2008, p. 93).

It could be an interesting topic for future research whether depression, musical preferences, and personality (traits) influence shape the musical improvisations. The topic of interest would be the relationship between expression through musical improvisation, emotional content, musical preferences, personality, and depression.

6.2.5 Depression and anger

Punkanen (2011) investigated also the perception of emotions in music in the same group of clients suffering from depression. The perception of the population was clearly impaired. Punkanen (2011) found in a music listening experiment patterns of misinterpretation or confusion and especially for the emotion anger. The ratings were high for sadness when tenderness was presented and the ratings were high for anger when fear and sadness were presented. The relationship with depression stayed ambiguous. However, Novaco (1977) already recognized the relationship between expression of anger and depression. He and other researchers identified anger expression as a two dimensional problem. Namely, anger was "*both* inwardly and outwardly directed" (Schless, Mendles, Kipperman, and Cochrane, 1974; Weissman, Klerman, and Paykel, 1971, in Novaco, 1977, p. 600). In the cognitive theory, anger is viewed as a function of attributions, appraisals, expectations and self-statements of specific, external, elicitations. In the psychodynamic theory unexpressed anger is described as a destructive force turned towards the self. However Novaco (1977)reminds:

> "The arousal of anger is far too complex to be understood in terms of single factor deficits such as appraisal or of deficits in a single modality such as cognition" (Novaco, 1977, p. 606).

The music that has been analyzed in this thesis regarded active, improvised music, played as a communicative duet by a therapist and a client. The findings point towards the improvisations being expressive of anger. Also the notes of the therapist mentioned anger after the improvisation. The therapist had written down that he felt after the first improvisation that "the client avoided to face and express the feelings of anger" (translation by Punkanen, 2014). Questions that remained unanswered point out directions of future research, as the theory underlines the importance. Namely, it remained unclear what the relevance of the emotional expression in the process of the client could have been and what the importance of the expression of specifically anger in the process of the recovery from depression was.

6.3 Investigation of differences and similarities between the improvisations

This thesis investigated two improvisations in different stages of the process of a depressed client. Namely, it depends on the length of the process and the moment where the client is in the process how feelings and emotions become manifest. The same applies to how the therapist will address these feelings and emotions. Naturally, there are different explanations

possible. In this thesis, interpretations have been made regarding the emotional content, severity of depression and differences in the musical communication at different moments in the therapeutic process. The findings of this thesis entail differences in both the body expression and musical features. Research question three reads;

3   How did the two improvisations differ or agree?

6.3.1 Emotional content

The analysis of the moment-by-moment experienced change in the improvisation from session 3 has generated the highest scores for anger and happiness. For session 17 the highest scores were indicating anger, fear and happiness. In table 15 all the features have been summarized for both sessions in order to make a comparison possible. Visual was that the features M pitch and M velocity appear to be the same, but the features SD pitch, articulation and tempo appear to be different in the moment-by-moment experienced changes of both sessions. Conclusive, the results seem to point out that the use of pitch, articulation and tempo were important in differentiating fear in the second improvisation.

6.3.2 Severity of depression

The theoretical concepts discussed here entail some evidence that points to the relation between both the body, musical cues and depression. In a recent study by Joshi et al. (2013b), the results point towards less, smaller and retarded movements to be related with more severe depressive states. The body language of the client appeared to be more active and adaptable in session 17, opposed to session 3 (see also table 17 and 18, p. 94). However, the data did not allow close investigation, as many aspects of the body language have been invisible to the researcher. Further investigation of this topic seems advisable.

In the brief theoretical framework the preparations have been made to compare the musical features to the acoustic cues investigated in the research by Mundt et al. (2012). In this study, the outcome yields a significant reliability for detecting speech pattern changes predicting courses of depression. Recapping, the MTTB related features 'Articulation' and 'Tempo' are interesting regarding the severity of the depression. Both articulation and tempo appeared to have adopted a highly flowing movement. It is difficult to say it is either high or low.

6.3.3 Musical communication

An interesting question that follows the analysis of the musical cues representing for example different emotions is how they differ between the two sessions. Additional analysis was carried out accordingly and produced some interesting findings. Namely, another way of looking at the differences between the two improvisations is interpreting the musical cues (besides from being expressive), as communicative cues and in other words as musical communication. The way how the therapist and the client play music, or communicate, can be an important part of a therapeutic relationship. In IPMT the therapeutic relationship is thought of as powerful in light of the 'common factor theory' (moreover in chapter 2.6.2). IPMT is partly rooted in psychodynamic music psychotherapy (PMPT). Bruscia (1998) described PMPT as processes of transference and countertransference between the client ant the therapist.

Transference and countertransference

An appropriate theory to discuss the findings regarding the therapeutic relationship in this study to would be the analytical view on transference and countertransference (moreover in chapter 2.5.3 and 3.6.2). Although there is no scientific evidence for the existence of these forces within the relationship, they serve the therapist well in constructing a truth about the therapeutic interaction together with the client. "They are images and metaphors for the client-therapist relationship" (Bruscia, 1998, p. xxii). Not every event, meaning both the persons and the therapy, represents transference and one should take note of this when looking at every single event. The analysis and findings in this study did not include relevant information on the topic of transference.

Using different instruments

Changing to another instrument is a quite common practice in music therapy, but for many clients applies that they accustom or have a preference for a certain instrument. Also other issues, like association or attributions, can influence or explain the use of different instruments (moreover in chapter 2.7.4). For example, instruments sound different, which can be captured in the word texture. Symbolically, texture in music (within one instrument, or another) can represent different energies, authorities, and relationships.

A few assumptions arose during the selection of events for the second analysis of this improvisation. For example, the expression is not only done by the client, but seemed more like a teamwork where the therapist adopts a wait and see attitude in the beginning. He starts later than the client and commences in a calm, flowing way. In the first improvisation only the mallet kat™ has been used by both the therapist and the client, whereas in the second improvisation all instruments were used. In the video was visual that the set-up of the instruments were better accessible, through the way how they had been arranged. Furthermore, the analysis of session 17 reveals that the therapist took multiple initiatives toward another instrument before the client did, but after that, the client switched instrument twice as much as the therapist (moreover in chapter 5.5.3). These changes have been referred to in the therapist's notes as well in a positive way. "Client: the variety and flow of improvisation expressed the qualities of my life" (translation by Punkanen, 2014). Conclusively, the contact with the therapist seems to enable the client in a positive way to experiment and reflect afterwards.

Musical features

In this thesis, the musical features were quantified to make investigation possible. No literature has been written regarding the musical features, or cues, and benefit of musical communication in the therapeutic relationship in music therapy. The outcome of this thesis (moreover in chapter 5.5) can be interpreted as an example of how to notate the musical communication between the client and the therapist in IPMT, when using MTTB (moreover in chapter 5.5). Below some brief summaries and interpretations have been given regarding the additional analysis and the findings of the musical features as communicative cues.

In episodes

Differences between the therapist and client, session 3 and 17 are in terms of musical cues quite minimal and seem to have a random pattern when looking at the descriptions of the musical features in the episodes (moreover in chapter 5.2.1 and 5.5.1). Perhaps the uniqueness of each musical improvisation inhibits comparison of such kind. It could also be possible that the answer lies in the context of the whole therapy process of the client. The overview that the MTTB graph provides, does give an overall impression of the improvisation.

In events

The features were described according to the definitions that were derived from the analysis process and they have been extended with codes describing the relationship between the lines that represent the therapist and the client (moreover in chapter 5.2.2 and 5.5.2). In the improvisations of the level of events it becomes clear that concerning the musical cues, the behavior of the therapist and client seems more synchronized in the latter session 17. It could be that both the therapist and the client are more acquainted to improvise musically with each other. Another interesting guess would be that both the therapist and the client were expressing similar emotions through the music. Thus, both parties synchronize in a higher degree, like also happens in a verbal conversation. However, the improvisations had different lengths and some graphs for session 17 were incomplete.

In moment-by-moment experienced changes

The moment-by-moment experienced change has been analyzed through the interpretation regarding the timing of the movement between the lines the represent the therapist and the client. The observations have been made in terms of quantity, quality, initiative, position (high/low) and length. For example, there were more similar movements observed in the moment-by-moment experienced change from session 17 and also more mirror movements. The behaviour marked with the definition pulling lines was comparable, but in the moment from session 3, there were bigger spaces observed between the lines representing a difference between the playing of therapist and the client.

Body expression

Expression suggests not only verbal, but also nonverbal cues and in other words, (non)verbal language, or expression. They are often referred to as channels of communication in both daily life and research. Examples of nonverbal communication are body language, facial expression, and vocal acoustics. Bodily gestures, reactions, positions reveal often a lot about the state of the client. For example, the body expression is connected to the emotional state (Castellano, Santiago, and Camurri, 2007). When someone suffers from depression, their expression also changes. It is commonly known among clinicians, and research also supports, that a person's communication changes when he suffers from depression. In music therapy, the physical activity of clinical improvisation is revealed by the predominant body positions,

facial expressions and the use of the hands and the energy flow when moving. For IPMT, the body expression has not been investigated before. The findings of this study can be interpreted as an example of how to notate the body expression as a form of communication between the client and the therapist in IPMT.

I have analyzed aspects in the body expression of both the therapist and the client in relation to each other for the events from session 3 and 17 (moreover in chapter 5.5.4). The commencements of the events represent the most expressive moments of the improvisations, thus it is likely that meaningful gestures have been made during these moments. Therefore, the segments from the beginning of the events have been chosen to elaborate upon (moreover in chapter 5.5.4). In general the therapist shows greater activity then the client. However in session 17, the client moves the hands more active in two moments out four. Furthermore, there are four moments where the movements for different parts of the body are the same. However, the quality of the activity for those movements have not been translated, thus I will not make any speculations with this limited data.

6.4   Advantages and limitations

In this chapter I will elaborate on the research process, beginning with answering research question four;

> 4   What did the process of microanalysis contribute to the use of MTTB graphs?

The main methods that I used in this thesis were microanalysis and MTTB. Microanalysis entails the "detailed analysis of a small but relevant amount of data drawn from a single experience with a client, or a single session" (Wheeler et al., 2007, p. 14). The process of microanalysis has given me direction while investigating the MTTB graphs. In the first level (episode), I noticed that I could not describe every detail, because they were not visual (initiatives, position of the lines). The second level (event) that was analyzed allowed a different approach to the data, which included more relative descriptions, or movements, of the lines. On the third level (moment-by-moment experienced change) it was possible to describe the full range of observations of the lines (quantity, quality and initiatives). Also for connecting the findings to the theory, the different levels of microanalysis provided a choice.

For example, I found it more suitable to interpret the emotional content of only a moment-by-moment experienced change, as this kind of interpretation demands unambiguous descriptions. For the severity of depression it seemed more appropriate to look at the emotional cues of the whole improvisation. Analyzing similarities and differences was possible on all levels of microanalysis.

Conversely, the MTTB graphs also provided a great addition to the process of microanalysis, thus I will answer question five;

5   How did the available evaluation tools contribute to the process of analyzing the data?

MTTB is able to compute graphs of any selection you would like to make in the data. MTTB produces the "raw data" and after that all research inclusion and design choices still had to be made. My analysis focused mainly on emotional content and musical features. In my experience, MTTB was well equipped to extract them and its methodology of retrieving different musical features seemed to match with other researcher's methods. Concerning the design of the MTTB graphs, increases and decreases were clear in the different musical features. Moreover, due to a wider distribution of the musical behaviour on the horizontal axis, the development of the two lines representing the client and the therapist is easier to follow. Musical behaviour like differences, adaptations, and synchronicity are more easily observable. Initiatives were not always very clear, thus a great amount of zooming in is required.

It must be stressed that MTTB does not read music, it reads acoustic cues. In other words, "it cannot easily, if not at all, extract musical phenomena such as melody and phrase" Erkkilä (unpublished manuscript). Therefore, I think it was unimaginable to use MTTB without using also other methods of analyzing the data. For example, the video source is an indispensable addition to the computer graphs. Another helpful source I obtained was the set of notes taken by the therapist regarding the topic they chose for the improvisations and the content of the discussion afterwards. Especially when trying to make sense, or meaning, the opinions of the participants were essential. Shortly, mentioning triangulation, I think that the two methods and the use of them were interwoven and having analyzed different types of data at the same time definitely helped me improving the quality of the analysis and the discussion.

Naturally there were some drawbacks in the process as well, which brings me to pointing out some limitations. For example, the body expression of the clinical improvisations could be observed with the help of a camera angled on the side of the therapist and the client (see also figure 2, p. 69). The camera hung on the ceiling, thus the perspective has an overview from above. It was quite difficult to see the movements from time to time and the facial expressions were also difficult to read. Furthermore, MTTB was not equipped to include the musical material with an audio format, like the djembe. The second technique that would have been appropriate to use was using music information retrieval (MIR) toolbox. However, using the tool was not appropriate, because it differs in a fundamental way from MTTB and it would have lead to difficulties. One of the problems was that the therapist and the client were playing both the audio and MIDI instruments at the same time. Attempting to connect both types of data would be a huge challenge in itself, creating a 'data overload' for this thesis.

6.5   Conclusions

This study generated ten descriptions that are suitable for analyzing MTTB graphs (see also table 20. p. 108). Some of these descriptions can be utilized on different levels and some are more suitable in specific levels of microanalysis. The analysis of this thesis had a semi open starting point and from there can be concluded that the levels of microanalysis can give direction to the selection processes in the MTTB graphs. The current data has been analyzed on three levels of microanalysis and suggests the expression of anger and other emotions through musical cues in the context of IPMT, a treatment for depression. Other emotions that were observed are for example happiness and sadness. Noteworthy is that the musical expression of anger seems very similar to happiness in terms of musical parameters, or acoustic cues. However, this observation does not take other special properties of music into account, like the symbolic meaning or associations.

Music psychology researchers demonstrated the positive role and meaning of music (moreover in chapter 2.7). They suggests further research also on the benefit of music for an emotional healthy life. Regarding the purpose and the meaning of emotional expression, different theories are available. The concept of emotion regulation supports the notion that depression relates to the socio-emotional behavior one adopts in every day life. Furthermore,

musical preferences and personality provide possible explanations for the type of emotions someone expresses through music. An example of emotion dysregulation is rumination, which refers to repetitively and passively thinking (vs. reflective self attentiveness as a constructive emotion regulation strategy). In this thesis, the emotional content, symbolic meaning and the connection to the severity of depression have been elucidated. The practice of IPMT seems suitable for observation and generation of meaning. For example, destructive cognitions (like rumination), or emotions can be identified and meaning can be given to them through verbal reflection.

Understanding the behaviour of the therapist and the therapeutic relationship is essential for the outcome of the therapy. The communication develops verbally and nonverbally, but in music therapy also musically. Psychodynamic theory stresses the importance of the therapeutic attitude, which can be related to an anonymous person that is neutral in the interaction with the client This enables the manifestation of the internal, dynamic conflicts in the most purest form possible (Leiper and Maltby, 2004, p. 44). This thesis suggests different ways of notating the musical communication of the therapist and the client together or separately. However, the findings did not regard specifically the role, benefit, or meaning of the musical communication in IPMT. Nevertheless, based on the presence of musical communication in the improvisations, the role and benefit of the music therapist in the process of working with emotions and emotion regulation skills is positive. For example, the therapist takes initiatives, which are followed by the client. This seems to enable musical, emotional expression, which could be interpreted as a form of nonverbal communication.

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Appendix I
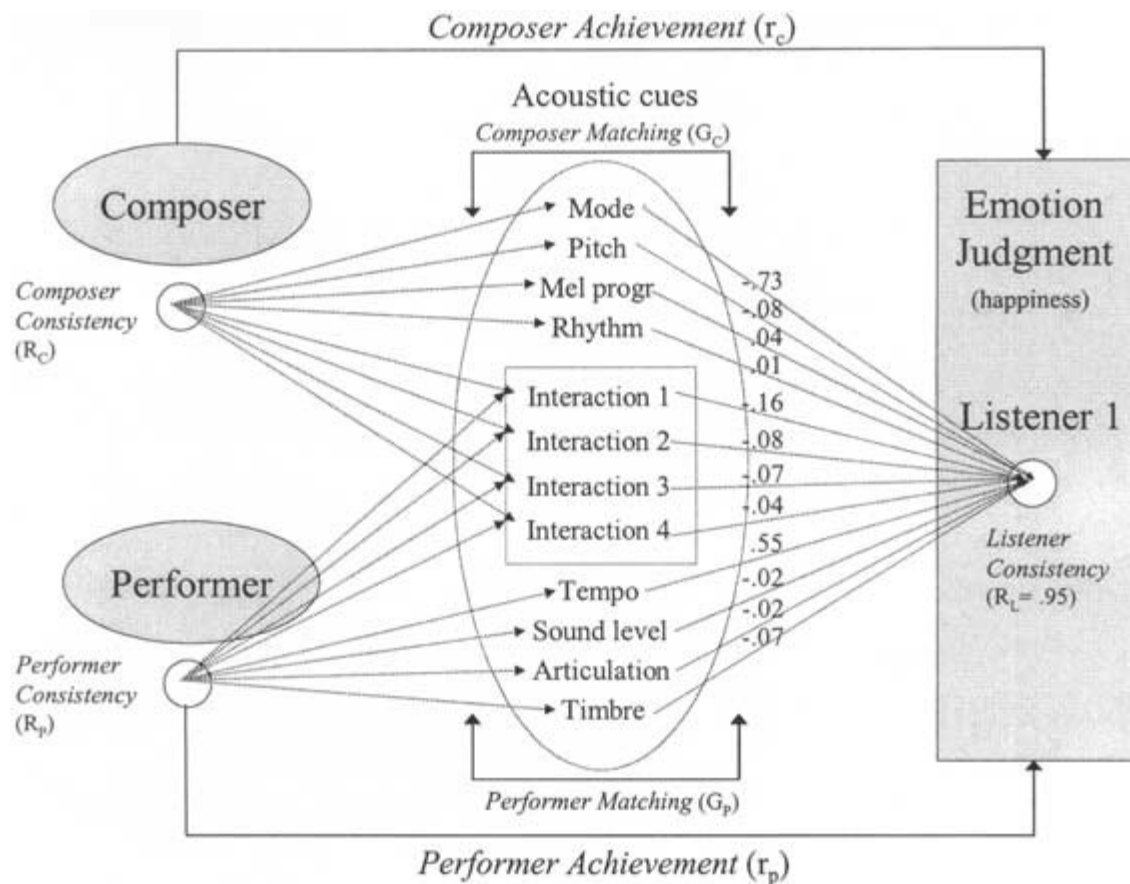
"Fig. 1. Extended lens model (ELM) of musical communication of emotions (from Juslin & Lindström, 2003). Note. The results included in the figure come from a simultaneous regression analysis of a listener's happiness ratings of musical pieces (R = .95, adj. R2 = .90). Values for individual cues refer to the beta weights (b) of the regression analysis" (Juslin & Laukka, 2004, p. 222).

Appendix II

Music Performance related codes (Juslin & Laukka, 2003), and MTTB related features. (the codes in brackets refer to umbrella codes that have been used on top of the specific code)

MTTB Features	Explanations	Explanations	Juslin & Laukka
Density	The number of played notes per time window	-	-
M Duration	The duration of the notes per time window	-	-
M Pitch	M of all named semitone keys of the MIDI keyboard, calculated through the value of the notes in a sliding window	"Pitch. Acoustically, F0 is defined as the lowest periodic cycle component of the acoustic waveform. One can distinguish between the macro pitch level of particular musical pieces, and the micro intonation of the performance. The former is often given in the unit of the semitone, the latter is given in terms of deviations from the notated macro pitch (e.g., in cents; Sundberg, 1991)."	F0 (Pitch)
SD Pitch	SD of all named semitone keys of the MIDI keyboard, calculated through the value of the notes in a sliding window	-	F0 variability
M Velocity	M of the strength of the onset of the hit on the keyboard	"Rapidity of tone onsets. Attack refers to the rise time or rate of rise of the amplitude of individual notes. It is usually measured from the acoustic waveform (Kotlyar & Morozov, 1976)."	Attack (Intensity)
Pulse clarity	Max. values of the pulsation diagram	-	-
Articulation	The amount of time intervals between the notes.	"Proportion of sound to silence in successive notes. The mean articulation of a performance is typically obtained by measuring two durations for each tone—the duration from the onset of a tone until the onset of the next tone (dii), and the duration from the onset of a tone until its offset (dio). These durations are used to calculate the dio:dii ratio (the articulation) of each tone (Bengtsson & Gabrielsson, 1980). These values are averaged across the performance and expressed as a percentage. A value around 100% refers to *legato* articulation; a value of 70% or lower refers to *staccato* articulation (Woody, 1997).	Articulation (Temporal aspects)
Tempo	Values that are associated with the max. values in the pulsation diagram	"Velocity of music. The mean tempo of a performance is obtained by dividing the total duration of the performance until the onset of its final note by the number of beats and then calculating the number of beats per min (bpm; Bengtsson & Gabrielsson, 1980)."	Tempo (Temporal aspects)
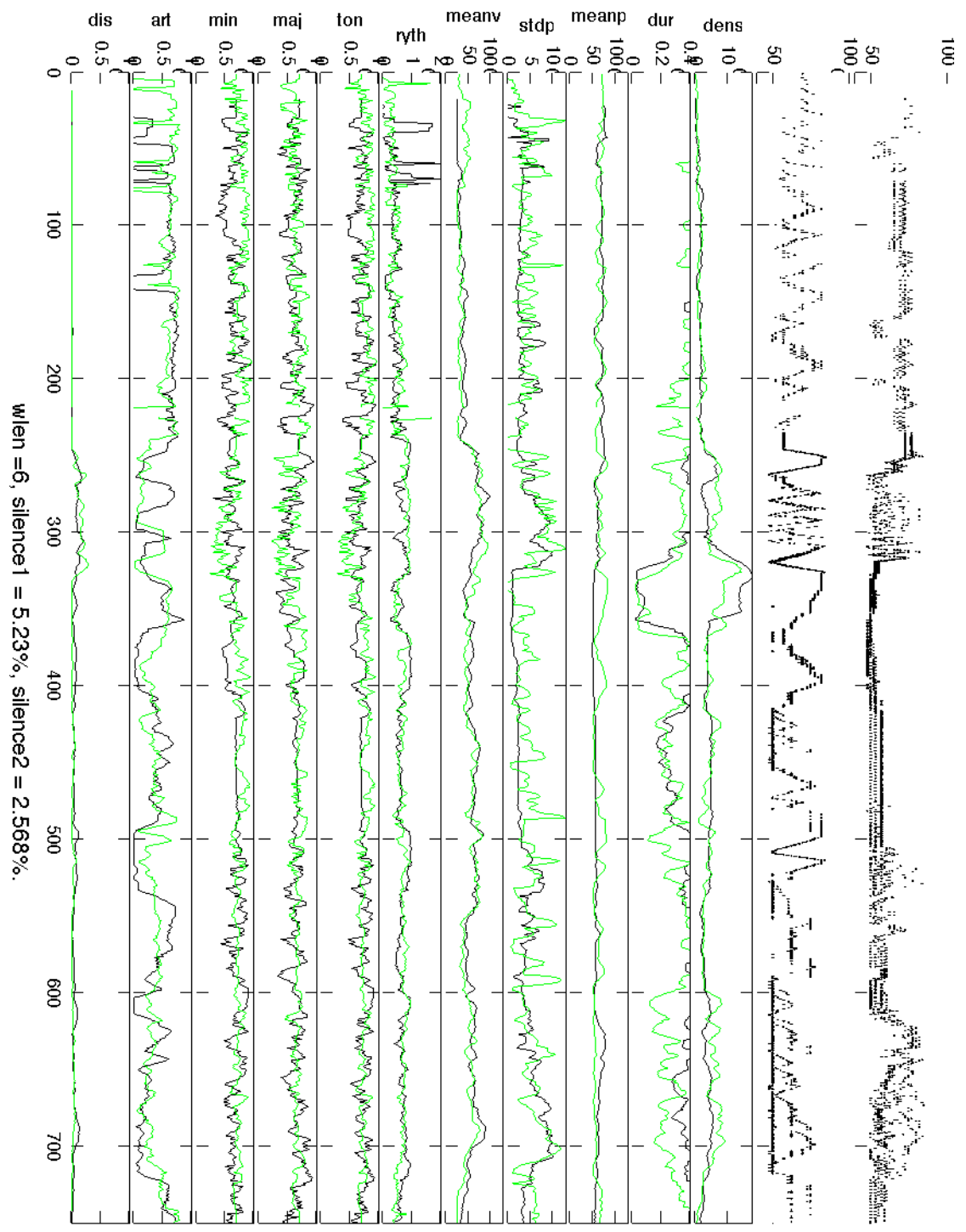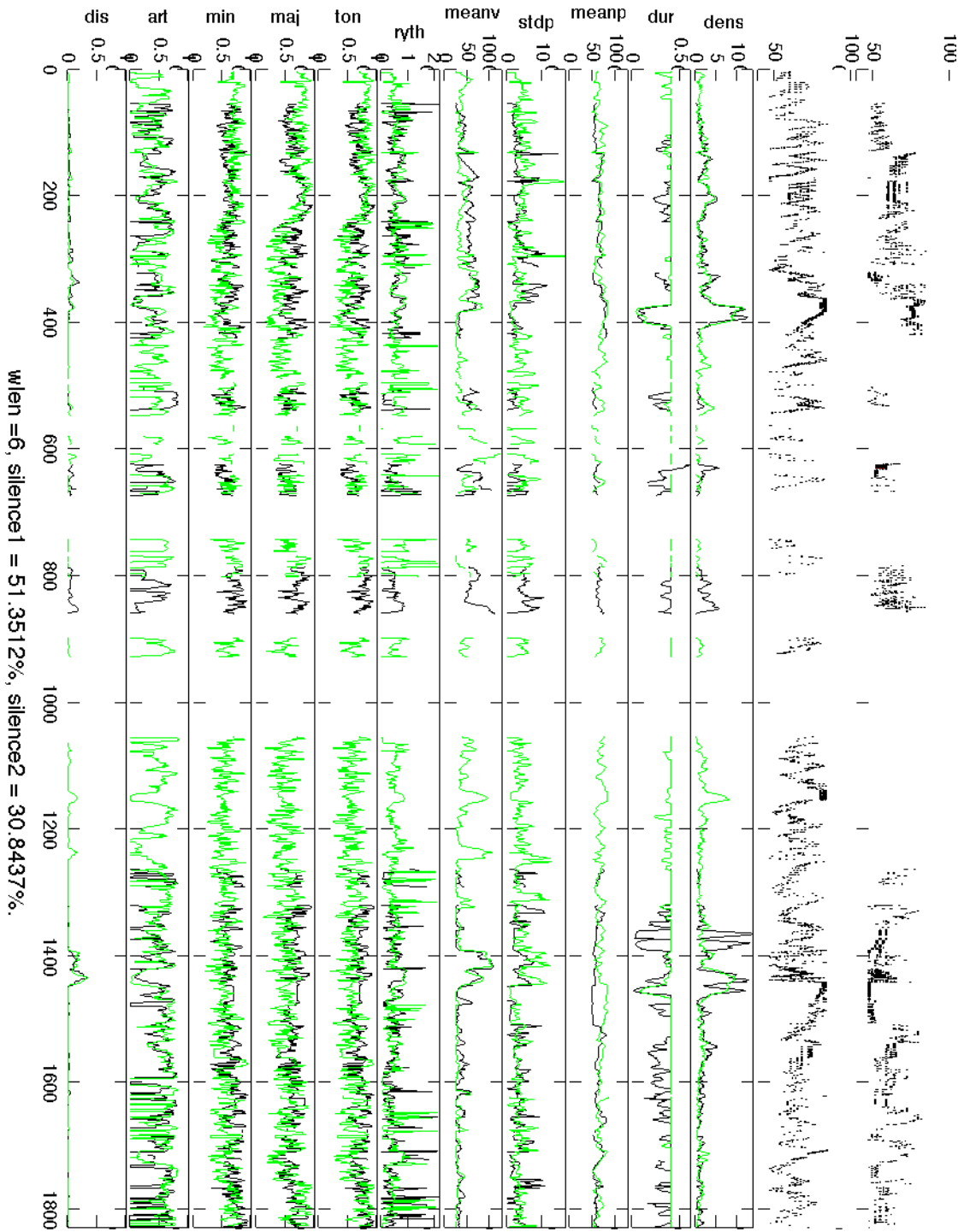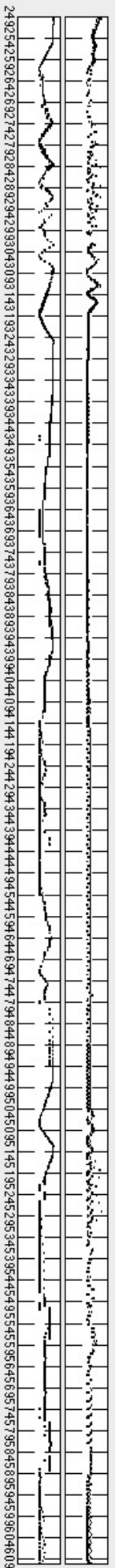
wlen =6, silence1 = 5.23%, silence2 = 2.568%.

dis
art
min
maj
ton
ryth
meanv
stdp
meanp
dur
dens

wlen =6, silence1 = 51.3512%, silence2 = 30.8437%.

830311O3O09a_m_JE.mid
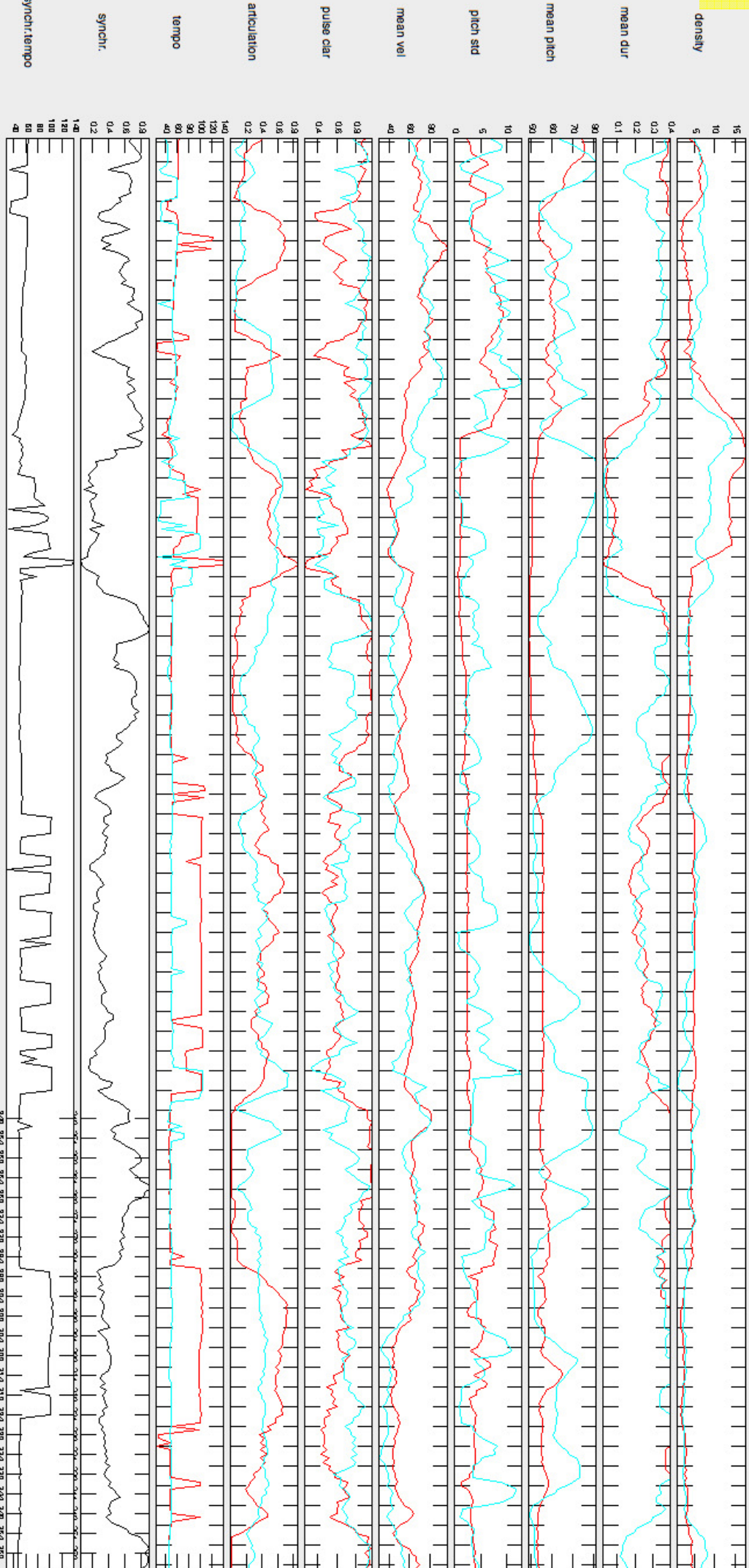
CH1: 0.0523
CH2: 0.0257

610
763

8303110309a_m_JE.mid

density
mean dur
mean pitch
pitch std
mean vel
pulse clar
articulation
tempo
synchr.
synch.tempo

83172705091_JE.mid

83172705099a_JE.mid

8317270509a_JE.mid

CH1: 0.5135

CH2: 0.3084

1186

8317270509a_JE.mid

density

mean dur

mean pitch

pitch std

mean vel

pulse clar

articulation

tempo

synch.

synch.tempo

8303110309a_m_JE.mid

831727050509a_JE.md

		Head client	Arms client	Hands client	Back client	Legs client	Feet client	Facial Expression client
Appendix XIII Session 3, Body Expression client.								
	0:00:00	Turned down	turning	little shaky, finger on stick	Overall: The torso	Overall:	On pedal	Overall: neutral, concentrated
	0:00:30	Turned down	turning	Loose grip	turns with the client	Close next to	Overall: No	and the client seems to look
	0:01:00	Turned down	turning	Loose grip	to where she is	eachother	visual	up several times. However,
	0:01:30	Turned down	turning	Loose grip	playing on the			due to the perspective of the
	0:02:00	Turned down	turning	Loose grip	mallet kat but in a			camera it is extremely difficult
	0:02:30	Turned down	turning	Loose grip	really minimal way			to see this. The 2 observed
	0:03:00	Turned down	turning	Loose grip				moments were on moments
	0:03:30	Turns sideward	turning	Loose grip				that the client was facing the
	0:04:00	Mildly waving	turning	Loose grip				camera more or less.
	0:04:30	Turned down	move towards	tighter grip to finger on stick				
	0:05:00	Turned down	keyboard	Finger on stick				
	0:05:30	Turned down	…	Finger on stick				
	0:06:00	Turned down	aimed move	Loose grip				
	0:06:30	Turned down	active	Finger on stick				
	0:07:00	Turned down	active	Loose grip				Look up
	0:07:30	Turned down	active	Loose grip				
	0:08:00	Turned down	aimed move	Tighter/looser grip				
	0:08:30	Turned down	active and on…	Loose grip				
	0:09:00	Turned down	aimed move	Finger on stick				
	0:09:30	Turned down	active and on…	Finger on stick				
	0:10:00	Turned down	aimed move	Loose grip				
	0:10:30	chin on chest	active and on…	Finger on stick				
	0:11:00		aimed move	Finger on stick				
	0:11:30	turned down	active and on…	Finger on stick				
	0:12:00	active	aimed move	Loose grip				Look up
	0:12:30	active	…	Lift sticks after playing				
	0:13:00	active	…					

Session 3, Body Expression therapist.	Head Therapist	Arms Therapist	Hands Therapist	Back Therapist	Legs Therapist	Feet Therapist	Facial Expression Therapist	
0:00:00	Turned down	Overall:	Overall:	Straigtned	a little wide next to	no	Overall: neutral	
0:00:30	Turned sideward	The arms	Loose grip	bent back	eachother and on…	visual	concentrated	
0:01:00	Active	are held		leaning forward, straigth	…		but extremely	
0:01:30	Turned sideward	a little		bent back	…		difficult to see,	
0:02:00	Minor waving	wide and		bent back	Lift leg and use it to		also because of	
0:02:30	Turned sideward	make the		straightned	move. Then leaves it		the glassess.	
0:03:00	Active	movemen		straightned	to rest. Then uses it			
0:03:30	nodding	expressive		straightned	again and on…			
0:04:00	Active			straightned	…			
0:04:30	Active			straightned	…			
0:05:00	nodding			straightned	Wide next to each other			
0:05:30	nodding			straightned	Lifts leg and put folded			
0:06:00	nodding			straightned	inwards and leaves it and on			
0:06:30	Waving			straightned	…			
0:07:00	nodding			straightned	…			
0:07:30	side and down			straightned	…			
0:08:00	Waving			straightned	…			
0:08:30	Waving			straightned	…			
0:09:00	Active			straightned	…			
0:09:30	Turned sidewards			straightned	…			
0:10:00	Waving			bent back	lift bottom, besides eachoth			
0:10:30	Active			bent back	and leaves it			
0:11:00	Waving			straightned	lift leg a little			
0:11:30	Turned down			straightned	almost back to first position			
0:12:00	Active			straightned				
0:12:30	Active			straightned	pushed himself back			
0:13:00	Active			straightned				

	Head client	Arms client	Hands client	Back client	Legs client	Feet client	Facial Expression client
Appendix XIV.		**Session 17. Body Expression Client.**					
0:00:00	Active	Loose by	gripping the mallets		No clear action	One on floor	Note. Very blurry and un-
0:00:30	turned down	her side	very loose grip	repositions	see also	and one on	clear image of the face
0:01:00	turned down	and moving	gripping the mallets	sits with back	feet client	chair and on…	
0:01:30	active	toward the	very loose grip	in the backrest	prob One on pedal	...	
0:02:00	turned down	notes she	loose grip	of the chair	and on	...	
0:02:30	turned down	wants to	loose grip	in the backrest	...	...	
0:03:00	active	play and on...	loose grip	in the backrest	...	...	
0:03:30	active	...	loose grip	in the backrest	...	...	
0:04:00	turned down	...	gripping the mallets	in the backrest	...	...	
0:04:30	turned down	...	loose grip	in the backrest	...	...	
0:05:00	turned down	...	loose grip	in the backrest	...	...	
0:05:30	turned down	...	loose grip	in the backrest	...	...	
0:06:00	mildly turned to side	sudden lift up	loose grip	Straightned	...	...	
0:06:30	turned down		finger on mallet	falls back	...	...	
0:07:00	turned down		finger on mallet	into chair	...	...	
0:07:30	turned down		finger on mallet	in the backrest	...	...	
0:08:00	turned down	sidewards	finger on mallet	in the backrest	...	...	Looking up
0:08:30	active	toward the	finger on mallet	in the backrest	…	…	Looking up
0:09:00	turned down	drum	finger on mallet	in the backrest	...	...	
0:09:30	turned down	and on	finger on mallet	in the backrest	...	...	
0:10:00	Active	very active	finger on mallet	in the backrest	...	...	
0:10:30	Active	moving in	finger on mallet	in the backrest	...	...	
0:11:00	turn from side to side	line with	loose grip	in the backrest	...	...	
0:11:30	turn from side to side	the playing	loose grip	in the backrest	...	...	
0:12:00	turned down	an so on…	loose grip	in the backrest	...	...	
0:12:30	Active	...	finger on mallet	in the backrest	...	...	
0:13:00	Active	...	finger on mallet	in the backrest	...	...	Looking up
0:13:30	turn from side to side	...	finger on mallet	in the backrest	...	...	Looking up
0:14:00	turn from side to side	...	finger on mallet	in the backrest	...	...	
0:14:30	turn from side to side	...	loose grip	in the backrest	...	...	

	Session 17. Body Expression Client. Continuation						
	Head client	Arms client	Hands client	Back client	Legs client	Feet client	Facial Expression client
0:15:00	Active	...	loose grip	in the backrest	...	...	
0:15:30	turn from side to side	...	loose grip	in the backrest	...	...	
0:16:00	turn from side to side	...	loose grip	in the backrest	...	Picked up	
0:16:30	turned down	...	loose grip	in the backrest	...	right foot	
0:17:00	turned down	...	loose grip	in the backrest	...	coming closer	
0:17:30	very active	...	loose grip	in the backrest	...	to the drum	
0:18:00	Active	...	loose grip	straightned	...	Both feet	
0:18:30	Active	...	loose grip	straightned	...	wide on the	
0:19:00	turned down	...	active action to shoulder	straightned	...	floor and then	
0:19:30	turned down	...	loose grip	straightned	…	back to first	Looking up
0:20:00	Active	...	loose grip	straightned	...	position	Looking up
0:20:30	Active	...	loose grip	straightned	...	First position	several times looking up
0:21:00	mildly turned to side	...	loose grip	straightned	...	and on...	
0:21:30	turned down	...	loose grip	straightned	...	...	
0:22:00	turned down	...	loose grip	straightned	...	...	
0:22:30	Active	...	loose grip	straightned	...	...	
0:23:00	Active	...	loose grip	straightned	...	...	smile
0:23:30	Active	...	loose grip	straightned	...	...	
0:24:00	mildly turned to side	...	finger on mallet	straightned	...	...	
0:24:30	mildly turned to side	...	finger on mallet	straightned	...	...	
0:25:00	turned down	...	loose grip	straightned	...	...	
0:25:30	mildly turned to side	...	loose grip	straightned	...	...	
0:26:00	mildly turned to side	...	loose grip	straightned	...	...	smiling
0:26:30	turned down	...	loose grip	straightned	...	...	smiling
0:27:00	Active	...	loose grip	straightned	...	...	
0:27:30	mildly turned to side	...	loose grip	straightned	...	...	
0:28:00	Active	...	loose grip	straightned	...	...	Looking up
0:28:30	mildly turned to side	...	loose grip	straightned	...	...	
0:29:00	Active	...	gripping the mallets	straightned	...	...	Looking up
0:29:30	Active	...	gripping the mallets	straightned	...	...	
0:30:00	Active	...	loose grip	straightned	...	...	
0:30:30	Active	...	loose grip	straightned	…	...	

	Head Therapist	Arms Therapist	Hands Therapist	Back Therapist	Legs Therapist	Feet Therapist	Facial Expression Therapist
Session 17. Body Expression Therapist.							
0:00:00	turned down	straight	resting on knee	In backrest	wide next to	both on chair	Note. Very blurry
0:00:30	turn from side to side	straight	resting on knee	bent back	eachother		and image of the
0:01:00	turned down	Loose by the	loose grip	straightned	further no clear	both on ground	face not always
0:01:30	turned down	side and moving	loose grip	straightned	action and on…	prob on pedal	visual
0:02:00	Active	twards the notes	loose grip	straightned	…	but no clear	
0:02:30	mildly turned to side	Sudden lift up	loose grip	straightned	…	visual and on…	
0:03:00	Active	Loose by the	loose grip	straightned	…	…	
0:03:30	very active	side and moving	loose grip	straightned	…	…	
0:04:00	Active	twards the notes	loose grip	straightned	…	…	
0:04:30	Active	and on...	finger on mallet	straightned	…	…	
0:05:00	very active, nodding	...	loose grip	straightned	…	…	
0:05:30	Active	...	loose grip	straightned	…	…	
0:06:00	turned down	Sudden lift up	loose grip	straightned	…	…	
0:06:30	turned down		loose grip	straightned	…	…	
0:07:00	Active		loose grip	straightned	…	…	
0:07:30	turned down, nodding		loose grip	straightned	…	…	
0:08:00	turned down	Sudden lift up	both hand/mallet	falls back but	…	both on chair	
0:08:30	Active		both hand/mallet	straightned	…	prob One on pedal	
0:09:00	turned down		both hand/mallet	straightned	…	and on …	
0:09:30	Active		hands, fingers	straightned	…	…	
0:10:00	mildly turned to side		hands, whole	straightned	…	…	
0:10:30	Active		both hand/mallet	straightned	…	both on chair	
0:11:00	active, shaking	Sudden lift up	hands, whole	straightned	…	prob One on pedal	
0:11:30	active, nodding	Loose by the	hands, whole	straightned	…	both on chair	
0:12:00	active, nodding, shaking	side and moving	active action to nose	straightned	…	…	
0:12:30	active, side turning	twards the notes	hands, whole	straightned	…	both tipping ground	
0:13:00	active	and on...	both hand/mallet	straightned	…	…	
0:13:30	active	...	loose grip	bent	…	…	
0:14:00	active, nodding	...	loose grip	bent	…	…	
0:14:30	turned down	...	loose grip	bent	…	no visual and on…	

	Head Therapist	Arms Therapist	Hands Therapist	Back Therapist	Legs Therapist	Feet Therapist	Facial Expression
			Session 17. Body Expression Therapist. Continuation				
0:15:00	active nodding	...	finger on mallet	bent	…	…	
0:15:30	active nodding	...	loose grip	bent	…	…	
0:16:00	active nodding	...	loose grip	straightned	…	…	
0:16:30	active	...	loose grip	straight	…	…	
0:17:00	very active, nodding	...	loose grip	straightned	…	…	
0:17:30	active nodding	...	close together	straightned	…	…	
0:18:00	active nodding	...	close together	straightned	…	…	
0:18:30	very active nodding	...	close together	straightned	…	…	looks up
0:19:00	active, turned down	...	close together	straightned	…	…	
0:19:30	turned down	…	close together	straightned	…	…	
0:20:00	very active	…	close together	straightned	…	…	
0:20:30	very active	Swing backward	mallet between fingers	falls backandforth	…	…	
0:21:00	active	Sudden lift up	mallet between fingers	straightned	…	Both feet wide	
0:21:30	active	Rounded move	loose, between fingers	straightned	…	on the floor and on	
0:22:00	active, turned down		loose grip	straightned	…	…	
0:22:30	active, nodding	Sudden lift up	loose grip	straightned	…	…	
0:23:00	turned down	Sudden lift up	loose grip	straightned	…	…	
0:23:30	active, look up, nodding	Sudden lift upS	loose grip	straightned	…	…	looks up
0:24:00	active, nodding, shaking	Sudden lift up	loose grip	straightned	…	…	
0:24:30	active	Sudden lift up	finger on mallet	straightned	…	…	
0:25:00	turned down		loose grip	straightned	…	…	
0:25:30	turned down		loose grip	straightned	…	…	
0:26:00	active, nodding		loose grip	straightned	…	…	
0:26:30	turned down		loose grip	straightned	…	…	
0:27:00	active, mildly turned side	Sudden lift up	loose grip	straightned	…	…	
0:27:30	turned down, nodding		loose grip	straightned	…	…	
0:28:00	active, turned down		loose grip	straightned	…	…	
0:28:30	active, nodding, turned side		loose grip	straightned	…	…	
0:29:00	active, turned down		loose grip	straightned	…	…	
0:29:30	very active		loose grip	straightned	…	…	
0:30:00	active		loose grip	straightned	…	…	
0:30:30	turned down		loose grip	straightned	…	…	