

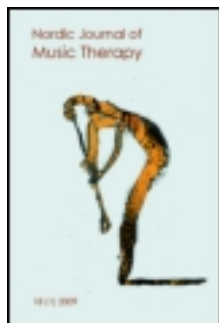
This article was downloaded by: [Anglia Ruskin University]

On: 07 July 2013, At: 08:30

Publisher: Routledge

Informa Ltd Registered in England and Wales Registered Number: 1072954

Registered office: Mortimer House, 37-41 Mortimer Street, London W1T 3JH, UK



Nordic Journal of Music Therapy

Publication details, including instructions for authors and subscription information:

<http://www.tandfonline.com/loi/rnjm20>

Creative music therapy with premature infants: An analysis of video footage

Friederike Barbara Haslbeck^a

^a Faculty of Medicine, University Witten/Herdecke, Witten, Germany

Published online: 15 Apr 2013.

To cite this article: Nordic Journal of Music Therapy (2013): Creative music therapy with premature infants: An analysis of video footage, Nordic Journal of Music Therapy, DOI: 10.1080/08098131.2013.780091

To link to this article: <http://dx.doi.org/10.1080/08098131.2013.780091>

PLEASE SCROLL DOWN FOR ARTICLE

Taylor & Francis makes every effort to ensure the accuracy of all the information (the "Content") contained in the publications on our platform. However, Taylor & Francis, our agents, and our licensors make no representations or warranties whatsoever as to the accuracy, completeness, or suitability for any purpose of the Content. Any opinions and views expressed in this publication are the opinions and views of the authors, and are not the views of or endorsed by Taylor & Francis. The accuracy of the Content should not be relied upon and should be independently verified with primary sources of information. Taylor and Francis shall not be liable for any losses, actions, claims, proceedings, demands, costs, expenses, damages, and other liabilities whatsoever or howsoever caused arising directly or indirectly in connection with, in relation to or arising out of the use of the Content.

This article may be used for research, teaching, and private study purposes. Any substantial or systematic reproduction, redistribution, reselling, loan, sub-licensing, systematic supply, or distribution in any form to anyone is expressly

Creative music therapy with premature infants: An analysis of video footage[†]

Friederike Barbara Haslbeck*

Faculty of Medicine, University Witten/Herdecke, Witten, Germany

(Received 27 April 2012; final version received 22 January 2013)

Music therapy with premature infants is a globally expanding field in neonatal care. However, to date, the interactive potential of active music therapy approaches with premature infants has received only limited attention in the literature. The aim of this paper is to evaluate possible patterns and types of relevant therapeutic change and interactions in creative music therapy with premature infants. The paper reports on the first phase of a larger qualitative multi-perspective study, which applies principles of grounded theory and therapeutic narrative analysis. Analysis of video footage of two premature infants was conducted to identify preliminary categories to serve as a phenomenon-orientated starting point for a larger grounded theory-based study. From the present results, a working hypothesis emerged that creative music therapy may encourage an active role for the premature infant, helping to uncover their communicative musicality, sensitivity to music, and meaningful relatedness that, in turn, may promote stabilization and development. Analysis further suggests that creative music therapy may be particularly effective to pacify, engage, and empower premature infants without being overwhelming. This is achieved through matching and sharing vitality forms in a continuous, finely-attuned musical re-adjustment process. In the second phase of the study, these themes are confirmed, expanded, or refuted by evaluating a larger number of cases.

Keywords: premature infants; music therapy; qualitative research; video analysis; empowerment

Introduction

Premature infants and their parents are a highly vulnerable group in paediatric care, since premature birth is a traumatic experience for both the infants and parents (European Foundation for the Care of Newborn Infants, 2009/2010; Jotzo & Poets, 2005). Many premature infants must cope with potential sensory tension of overstimulation and deprivation at a time when their brains

*Email: musiktherapie@haslbecks.info

[†]This article is accompanied by supplementary web material, which can be found here: <http://dx.doi.org/10.1080/08098131.2013.780091>

conventionally grow more rapidly than at any other period in their lives (Als & Gilkerson, 1997). The medically required isolation that follows premature birth can cause high levels of stress in the infant and “may exert deleterious effects on the immature brain and alter its subsequent development” later on (Als et al., 2004, p. 846). Alongside this, parents are confronted with numerous problems and challenges involved in premature birth and necessary intensive care interventions. They commonly live in uncertainty about the child’s survival. This uncertainty is often accompanied by feelings of fear, guilt, and grief, which may negatively affect the parent–child attachment process (Baum, Weidberg, Osher, & Kohelet, 2012).

In recent decades, various interventions have been developed to support this vulnerable group of premature infants and their parents (Als, 2009; Browne & Talmi, 2005). These interventions are intended to address challenges in neonatal care, to offer adequate assistance during this traumatic process, to reduce the risk of long-lasting adverse effects, and to improve quality of life (Field, Hernandez-Reif, Feijo, & Freedman, 2006). One particular intervention that has considerable potential in the neonatal intensive care unit (NICU) is music therapy. Worldwide, various receptive and active music therapy approaches have been developed and implemented (Nöcker-Ribaupierre, 2004; Standley & Walworth, 2010).

In an earlier integrative review of this topic (Haslbeck, 2012a), research on music therapy in the NICU was found to be expanding globally. This research demonstrates that music therapy is beneficial for premature infants, particularly in terms of pacification and stabilization (Haslbeck, 2012a; Standley, 2002). In clinical practice, there is a trend towards more interactive approaches involving live music therapy in the NICU (Haslbeck, 2010a). Besides a single study in a related field (Shoemark & Grocke, 2010), only quantitative intervention studies that mostly use receptive stimulation types of therapy targeting effects on the premature infant themselves have been identified to date. A small number of studies have used active music therapy with live music or have included parental perspectives (e.g., Schlez, Litmanovitz, Bauer, Dolfin, Regev, & Arnon, 2011; Teckenberg-Jansson et al., 2011; Whipple, 2000). So far, there has been little focus upon the therapeutic process between the therapist and the premature infant or between the parents and infant, particularly in terms of interactive approaches.

However, some studies have emphasized that the premature infant’s perceptive faculties and capabilities need to be recognized and actively engaged in interventions that are entrained to its rhythmic breathing (Thoman, Ingersoll, & Acebo, 1991). This suggests that interactive music therapy, particularly those approaches that are entrained to the rhythms of the infant (Haslbeck, 2004; Loewy, 2011), might contribute to more than just the pacification and stabilization of premature infants. In addition, initial trials have shown that the way in which we offer music therapy may be of significance (Ingersoll & Thoman, 1994) and that live music may have more lasting effects than recorded music (Arnon et al., 2006). Generally speaking, there is a need for research on the interactive potential of active music therapy in the NICU, as well as a need to

conduct qualitative, “real world research” (Robson, 2002) to evaluate real clinical therapeutic phenomena (Ansdell & Pavlicevic, 2010).

The aim of this paper is to evaluate the therapeutic process of an interactive music therapy approach – “creative music therapy for premature infants and their parents” – using qualitative tools to gain a deeper and more comprehensive understanding of interactive music therapy in neonatal care. Particular attention is given to the question of whether behavioural patterns and types of therapeutic relevant change and interaction can be identified. In accordance with the interactive viewpoint taken, potential resources and capabilities of premature infants that might be activated through creative music therapy are of particular interest.

Creative music therapy with premature infants and their parents

Creative music therapy (CMT) with premature infants and their parents is an interactive, resource-oriented music therapy approach based upon the “creative music therapy” approach initially developed by Nordoff and Robbins (1977). It has been adapted to address the specific needs of the vulnerable group of premature infants and their parents in the NICU setting (Haslbeck, 2004) and is based upon the principles of CMT used with patients in a coma (Aldridge, Gustorff, & Hannich, 1990). With this approach, the music therapist establishes human contact with the comatose patient through improvised “wordless singing based upon the tempo of the patient’s pulse and more importantly, the patient’s breathing pattern” (Aldridge et al., 1990, p. 345). CMT in neonatal care also uses the *music* of premature infants – their breathing patterns – as the most fundamental rhythm of any human being. The infants’ breathing patterns, paired with their facial expressions and gesticulations, are carefully assessed and recognized by the therapist and transformed into infant-directed humming. The improvised quiet humming is registered and adjusted constantly to the fragile rhythms and subtle expressions of the premature infant, starting from the premise that the infants are not overwhelmed (Haslbeck, 2010b). Parents, if available, are integrated individually into the therapeutic process to promote the parents’ autonomy and support the intuitive parent–infant interaction and, thus, the bonding process, as described elsewhere (Edwards, 2011b).

Methods

Study design

A qualitative multi-perspective longitudinal study was conducted using the principles of grounded theory (Strauss & Corbin, 1998) and therapeutic narrative analysis (Aldridge & Aldridge, 2002) to explore the potentials and limitations of creative music therapy with premature infants and their parents in a neonatal care unit. In-depth analysis of video footage of the therapy and interview material collected from the parents were utilized, based upon methodological principles developed by Haslbeck (2012b). This paper reports on the explorative first phase

of this larger study to identify preliminary categories of therapeutically relevant changes and interactions in the therapeutic process, with the premature infant serving as a phenomenon-oriented starting-point for a larger study. Ethics approval of the entire study (both phases) was obtained from the Ethics Committee of the Medical Council Westfalen-Lippe/Medical Faculty of the University of Münster (2008-311-f-S).

During the explorative first phase of the study, which is described in this paper, the main focus was to identify preliminary categories of therapeutically relevant changes and interactions within the therapeutic process, focusing on the premature infant itself, to serve as a phenomenon-oriented starting-point for the larger study. Analysis of video footage was used to gain this sought-after deeper understanding of interactions and to elicit preliminary categories for the coding of observational events by investigating micro processes of change (Aldridge & Aldridge, 2002; Polit & Beck, 2004; Wosch & Wigram, 2007).

Participants

Access to study participants was obtained through the primary author in the neonatal care units (levels III + II) of the project clinics¹ where the author also was employed as a clinician. Inclusion criteria were the same as for the standard clinical practice of CMT in the NICU: the premature infants had to be referred by the neonatal team for music therapy, be medically stable, be at least one-week old, and not be too heavily sedated (Haslbeck, 2011). Between July 2001 and May 2002 and also between November 2006 and July 2008, seven premature infants who received CMT as standard clinical practice and who displayed as contrasting characteristics and diagnoses as possible were included in this first phase of the study (see Appendix 1).

Data collection

Initial background information was obtained on the infants and their parents to determine an individual treatment plan, with interdisciplinary agreement. The parents were informed about the therapy and the study procedure in detail, and their informed consent requested and obtained. After daily assessment by the staff about the appropriateness of conducting a music therapy session, there was continuous video recording of the premature infants for five minutes prior, during and after each music therapy session. In total, 74 sessions on seven premature infants (17 hours and 20 minutes) were videotaped using a Canon Digital Video Camcorder ZR 900 mounted on a tripod next to the premature infant's incubator or warming bed. To address the need of between-method-triangulation and to guarantee the safety of the premature infant, detailed

¹Essen University Hospital, Germany and Children's Hospital Bielefeld, Bethel, Germany.

reflections on methodical and therapeutic procedures, environmental circumstances and additional objective data, such as the infant's physiological monitor readings (respiration and heart rate, oxygen saturation), were written down on a protocol sheet, which also in some instances included comments by staff and parents (Holloway, 1997) (Web Appendix I). Drawing on the need to stay close to practice, data collection was performed in accordance with the development of the premature infants; i.e. in the course of music therapy sessions up to three times per week, each for a duration of 10 to 30 minutes until discharge (Aldridge, 2005; Robbins, 2005).

Data selection

Data were selected in the early stages of the study based upon theoretical sampling (Strauss & Corbin, 1998). Ten preliminary episodes were selected by the author that seemed both significant as examples for clinical practice, and representative of the focus of interest (Aldridge & Aldridge, 1996; Gilbertson & Aldridge, 2008; Strauss, 1994). The episodes are key events of therapeutic change and interaction – five examples of relaxation and five examples of stimulation – since these two contrasting effects were identified as key outcomes in the author's review of the literature (Haslbeck, 2012a) as well as within a case study on CMT in the NICU (Haslbeck, 2004). The selection process was validated by the ongoing presentation of video footage and its discussion among the interdisciplinary team of the project clinics, within interdisciplinary working groups, and at workshops and conferences² (Aldridge, 1996; Holloway, 1997; Wosch & Wigram, 2007).

In the final step of this selection process, two videotaped episodes (each lasting two minutes) of two sessions with two different premature infants were chosen for in-depth microanalysis: one representing an episode of relaxation and the other an episode of stimulation (compare with Shoemark & Grocke, 2010). These contrasting episodes were selected because they featured the best and most clearly pivotal phenomena, significant moments of therapeutic change and patterns of interaction (Aldridge & Aldridge, 2002; Flyvbjerg, 2006) (see Figure 1).

The selected music therapy episode of relaxation shows a clip of Melissa (pseudonym). Melissa is a German girl, born at 30 weeks of gestation weighing 1090 g, and diagnosed with bradycardia, hyperbilirubinemia and extreme restlessness (Appendix 1). In order to address her problems of restlessness and stress, the overriding music therapy goal was relaxation. The video recording was made when she was at 32 weeks gestational age, within the second and third minute of Melissa's fourth music therapy session. On that particular

²For example, World Congress of Music Therapy 2011 in Seoul, Korea; International Summit of Music Therapy in the NICU 2010 in New York, USA; International Congress of the Association of Infant Mental Health 2010 in Leipzig, Germany.

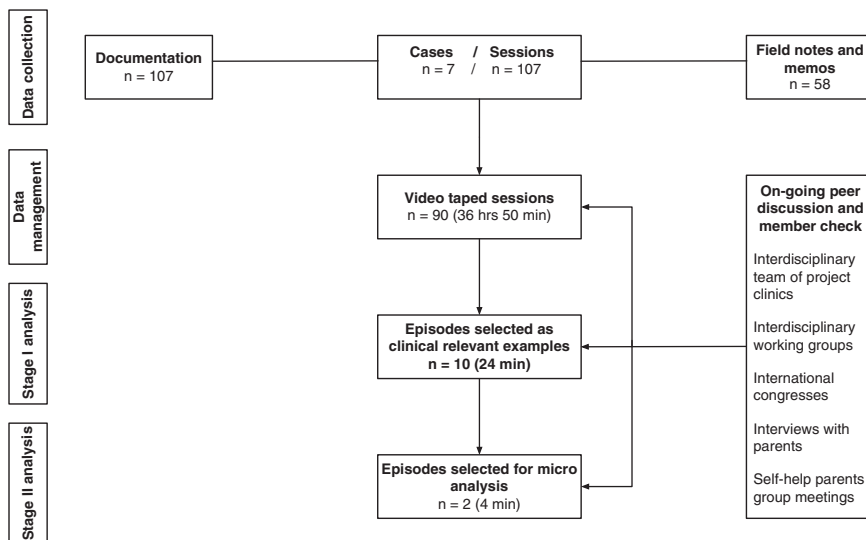


Figure 1. Selection process.

morning, Melissa was very restless before therapy. According to the concepts of CMT in the NICU, at the beginning of the filmed episode, the therapist has already placed her hand on Melissa's chest and then, after a short period of observation, begins to sing (Haslbeck, 2004) (see Figure 2 for transcript and video files for Video 1).

The selected music therapy episode of stimulation shows a clip with Melike (pseudonym). Melike is a Turkish girl, born at 24 weeks of gestation weighing 540 g, who had spent considerable time being ventilated, and had been diagnosed, among other things, with pulmonary oedema, profuse brain haemorrhage, and sensory deprivation. In order to address her problems of sensory deprivation, the overriding therapy goal was subtle, careful stimulation. The selected clip shows Melike at 35 weeks gestation in the fifth and sixth minutes of her thirteenth music therapy session (see Figure 3 for transcript and video files for Video 2).

Data analysis

Drawing on the principles of analysis in grounded theory, the selected episodes were transcribed and analysed in detail to develop preliminary categories (Holloway, 1997).

In the first step of analysis, the author conducted detailed transcription into conventional music notation to make subtle connections visible using Finale 2011 notation software. The transcription included three layers over the same timescale: environmental circumstances (noise), infant behaviour (musicality), and therapist behaviour (singing) (Figures 2 and 3). A conventional notation

system was selected for transcription, because it allows for detailed musical and interactive analysis with musical parameters of rhythm, tempo, phrasing, dynamics and tonality by displaying the musical and temporal activity inherent in the therapeutic process.

Environmental circumstances included machine noise and background noise. Drawing on the work of Als (1983; Als, Butler, Kosta, & McAnulty, 2005), the infant's behaviour reflects four layers: the premature infant's overall state; its gestures; its mimicry; and, if it occurred, any infant vocalization. Following recommendations made by Abromeit (2003), description and interpretation of premature infant behaviours were conducted using the Naturalistic Observation of Newborn Behaviors (NONB) sheet (Als, 1995), which is an assessment tool for the Assessment of Preterm Infant Behaviors (APIB), specifically designed to document the spectrum of a premature infant's neurobehavioral functioning by focusing "on the assessment of mutually interacting behavioral subsystems in simultaneous interaction with the environment" (Als et al., 2005, p. 94). Documentation of the therapist's behaviour mainly focused on the therapist's singing which is shown in Figures 2 and 3.

To address the need for investigator triangulation, the transcriptions were evaluated in parallel by four independent interdisciplinary analysts with "a diversity of theoretical and professional backgrounds" to minimize bias and to enhance the interpretative expertise of the population in question (Holck, 2007; Shoemark & Grocke, 2010 p. 311). These analysts were: one musician/composer/music therapist (who confirmed the musical transcriptions in all three layers by using, among other things, the two computer programs "Transcribe 8" and "Dr. Betotte"); one German neonatologist and one German neonatal nurse (who both confirmed the description and interpretation of infant behaviours); and a music therapy investigator, who confirmed the entire transcription and its interpretation.

In level 2, detailed horizontal and vertical "thick descriptions" (Denzin, 2003) were produced based upon the transcriptions, memos and protocols, and rechecked against the video footage (Web Appendix II). The common timescale facilitated an exact description of the relationships between the superimposed layers. Horizontal analysis provided insights into processes over time, and vertical analysis facilitated the identification of patterns of interaction, coherence and possible causal relationships between the particular layers and, thus, between the child, therapist and environment within the music therapy process.

In level 3, interpretations and pattern generalization of the thick description were elicited (Aldridge, 1996; Holck, 2007) (Web Appendix III). During the open coding stage, interpretations were reduced to single words and, in cases of overlap or similarity, collapsed into the same code. During the axial coding stage, codes were subsequently synthesized into categories and linked around a central category. A large chart board with moveable coloured labels was used to facilitate the arranging and rearranging of codes within categories and categories

within central categories, as well as to specify relevant conditions and consequences for the relationships between categories (Creswell, 2007).

Via this synthesizing process, the model called “the process of therapeutic change” developed by Stern and the Boston Process of Change Study Group (BPCS) (Stern et al., 1998) was applied. Stern’s theory of affect attunement (Stern, 2010a) as well as the theory of communicative musicality by Malloch and Trevarthen emerged to serve as sensitizing concepts for data analysis (Ansdell et al., 2010; Malloch & Trevarthen, 2009).

The BPCS illuminates the value of the “moment of meeting” inherent in a therapeutic process as an “emergent property of the dyadic system that pushes it into a new state of intersubjectivity – Tronick’s dyadic state of consciousness – thus, changing the relationship” (Stern et al., 1998, p. 307). Affect attunement is the sharing of vitality forms, observed and evaluated by Stern (2010a, 2010b), that exists between parents and infants in their intuitive interactions. Communicative musicality “is a theory of how human vitality acts, regulates itself, forms intimate relationships and grows in friendships, and also how it defends itself when the physical or social environment is threatening, and how it can be undermined by illness” (Trevarthen, 2008, p. 37).

All codes and categories that emerged from the analysis were organized into therapist behaviours, infant behaviours, or the interaction between the premature infant, the therapist and the environment. Subsequently, they were compared against pre-defined concepts. Finally, several central categories and a preliminary working hypothesis emerged that was discussed and double-checked with the interdisciplinary analysts (Figure 4).

Results

The findings presented here include results from the full data set of this first phase of the study, and indicate that music therapy with premature infants may be more than just relaxation and stabilization or stimulation, as mainly recognized in the literature to date. Creative music therapy may contribute to the infant’s relaxation *and* stimulation at the same time, and more. It also may facilitate *empowerment* through intersubjectivity in music. The therapist’s overriding attitude of responsiveness giving tone via infant-directed improvised singing, entrained to the infant’s breathing rhythm, gestures and mimicry may facilitate shared communicative musicality; for example, via synchronization. As a consequence, the infant may be able to calm down, orientate and engage in subtle relatedness inherent to the music therapy process (Figure 4). The following sections provide a more detailed portrayal of the elicited categories.

Responsiveness of the therapist

When all categories of therapist behaviours from both video examples were listed, one central category was identified: *responsiveness*. Here, responsiveness

refers to the therapist's ability to listen, understand, and respond adequately with perceptive, reflective and musical adaptive capacity, as outlined by Jacobs in his theory of enactive responsiveness (Jacobs, 2005) (Figure 4).

In this sense, first the therapist's responsiveness involves *waiting* and *giving time*. This can be observed at the very beginning of the selected therapy session with Melissa, when the therapist waits for several seconds before starting to hum, because Melissa seemed to be too aroused (State 5A, as defined by Als, 1995) to offer her any new additional stimulus (Figure 2: phase A; Web Appendix II, Video 1: seconds 0:00–0:20). In the episode with Melike, exemplified in the moment of distress caused by pain experienced after she accidentally pulled on her nose tube, the therapist *waits*, purposefully pausing to re-adjust and not overwhelm Melike (Figure 3: bar 5; Video 2: 0:08–0:11).

Second, responsiveness involves *holding* and *calming*, as seen in an example with Melike in a multimodal manner: *holding* a long note on the tonic of the scale to create a stable and calming musical anchor and *holding* Melike closer with the therapist's hand on Melike's chest in a situation of upcoming distress, as mentioned above (Figure 3: end of phase AII; Video 2: 0:08–0:11). In the example with Melissa, the therapist starts to hum with *holding* and *calming* musical parameters, while responding to Melissa's distress (humming as constantly, simply, repetitively, calmly, as softly as possible with a melody centred around the tonic of a scale with minimal melodic steps, characterized by melodic fluency and decelerating tempo) (Figure 2: phase B; Video 1: 0:21–0:44).

Third, responsiveness involves steady *attunement* to the environment and the infant's internal state of feeling throughout the therapeutic process. On one hand, the therapist's improvised, infant-directed singing is characterized by *tonal and harmonic attunement* to the pitch of the monitor beeps. In the example with Melissa, the therapist sings in B major so that the beeping sound rings out on the major sixth to the C sharp holding tone of the melody (Figure 2: arrow bar 13; Video 1: 1:04). In the example with Melike, the therapist sings in A flat major, so that the beeping sounds ring out on the perfect fifth to the note predominantly being sung (Figure 3: rectangle, bar 37–42, Video 2: 1:49–2:05). The therapist also tonally attunes her humming to Melissa's vocalizations. Melissa grunts on a F# and C#, and the therapist attunes to this by hearing and interpreting these grunts as the tones of the tension-packed dominant to B major, resolving this dominant by starting to sing in the basic key of B major (Figure 2: arrows for phases A to B, Video 1: 0:00–0:22).

In addition, the therapist's quality of humming is characterized by *affect attunement* (Stern, 2010a). The therapist uses *affect attunement* by matching and sharing the dynamic forms of vitality of the premature infant with different modalities. This was identified in the episode with Melissa during that moment when she smoothly moves her fingers up and smiles slightly, to which the therapist shares these rising vitality forms by also elevating her tempo, melody and dynamic. Then, when Melissa's finger moves downwards and her smile stops, the melody also drops in pitch (Figure 2: rectangle, phase D, Video 1:

1:34–1:45). This *reciprocal affect attunement* during a *smiling moment* is even clearer in the example with Melike, when she smiles and the therapist shares this dynamic form of vitality by also having the melody rise and increasing the dynamic with a crescendo (Figure 3: rectangle, phase BII; Video 2: 0:37–0:43). Furthermore, the therapist uses subtle “*over-attunement*” (Stern, 2010a, p. 114) to stimulate and encourage the more relaxed and flaccid premature infant with varying, stimulating musical parameters. This is recognizable during the episode with Melissa in terms of *accelerando* and modulation in a higher pitch (Figure 2: bars 12–13, Video 1: 0:55–1:06) as well as in the episode with Melike in terms of an *accelerando* and ending phrase on the suspense-packed dominant (Figure 3: phase AI; Video 2: 0:00–0:04). Furthermore, the therapist uses “*under-attunement*” (Stern, 2010a, p. 114) to purposely mismatch the dynamic features of infant stress, so as to regulate and calm the aroused infants by offering relaxing musical parameters, as already mentioned in the overlapping category of *holding* and *giving time*. In general, the therapist’s singing can be characterized as under-attunement, intended not to overwhelm the fragile infants. The singing is characterized by soothing musical parameters; e.g., simplicity, repetition, calmness, predictability and melodic fluency with glissando.

Fourth, responsiveness implies entrainment since, in the words of Aldridge (1996, p. 29), the “connection of rhythms is seen as the phenomenon of entrainment”. The therapist steadily *entrains* her rhythm of singing to the infant’s breathing rhythm in an adaptive, re-adjusting way.³ This is seen in both transcripts in the steady tempo changes of the therapist’s singing, as well as by comparing the noted breathing rhythms of the infants with the rhythms of the therapist’s voice (Figures 2 and 3, and Videos 1 and 2).

Vague moments of meeting and the process of change

In analysis, several forms of interaction between the therapist and premature infant (and the environment) emerged as a consequence of this responsiveness, such as the category of vague moment of meeting (Figure 4). After transcribing all video material, the author divided the transcripts into several phases and ascribed meaning to these divisions. Particularly in the example of Melissa, it became obvious that the phases reflect the infant’s more relaxed and attentive states (from state 5A to 5B to 4B, as defined by Als, 1995) and that in the shifts between these phases, vague minimal moments of meeting, followed by a second of open space, a similar pause, occurred (Figure 2: ovals). As a consequence of these vague moments of meeting, the therapist and Melissa proceeded at a new, more intense level of relating. Over the course of the episode, Melissa moved into a more relaxed (Figure 2: phase A–C; Video 1: 0:00–1:33) and attentive state (Figure 2: phase C–D; Video 1: 0:44–2:00) accompanied by the

³When the infant’s breathing rhythm was not visible, the therapist could still feel the breathing rhythm of the infant with her hand on the infant’s chest.

continuously adapting singing of the therapist with more and more variations within a larger number of musical parameters (Figure 2 and Video 1).

Communicative musicality

Another consequence of the therapist's responsiveness in infant-directed singing that may arise as a result of the interaction between therapist and premature infant is explained by the concept of *communicative musicality* (Figure 4).

To begin with, this can be identified as involving "*interactional synchrony*" (Aldridge, 1996, p. 57). This feature is seen in the session with Melissa as a form of synchronized tension. Melissa begins to synchronize her distressed gesture of finger splaying (as defined by Als, 1995) in phase B with the melodic, harmonic and phrasing tension of the therapist's singing. She stretches her fingers outwards at the same time as the higher tone of the melody is sung or when tension from the open end of a phrase arises (Figure 2: arrows phase B; Video 1: 0:24–0:37). It is possible to hypothesize that, through the musical synchronization of her distress-demonstrating gesture, she is shortly afterwards also able to follow the musical relaxation. When the melody returns to the fundamental note and phases out with a decrescendo at the end of phase B, Melissa moves her left arm and right finger downwards (Figure 2: dotted arrows phase B; Video 1: 0:38–:44).

Over the course of the episode, interactional synchrony grows stronger from the quality of synchronized tension, relaxation and timing to also involve synchronized attention and minimal expression in mimicry, gestures and breathing patterns. As the melody rises, the musical phrase comes to an end and the musical tension increases, Melissa synchronously opens her face or her eye(lid)s in a subtle way (Figure 2: arrows in phase C; Video 1: 0:56–1:33). When the melody goes down to the fundamental tone of the scale, she closes her eyes and, at the end of the whole musical phrase, she sighs quietly with a deep breath of relaxation (Figure 2: dotted arrows phase C; Video 1: 1:13–1:33). In addition, the rhythm of her breathing is synchronous with the rhythm of the therapist's singing (Figure 2: phase C; Video 1: 0:44–1:22). In phase D, she reaches a moment of being in self-synchrony, smiles slightly as her right little finger moves smoothly up. She is also in interactional synchrony with the therapist, who moves synchronously up with the melody, opens her mouth from humming to singing and elevates the dynamic with a crescendo. At that moment, the category overlaps with the category of affect attunement in a reciprocal way, as previously mentioned (Figure 2: rectangle phase BII, Video 1: 1:34–1:45).

Additionally, in the example with Melike, interactional synchrony of shared tension, timing and emotions was identified as a category of interaction. This can be seen in phase E in a moment of reciprocal affect attunement. Melike sighs and the therapist moves downwards with her melody and tempo via a *ritardando* – a steady slowing. Then Melike smiles and raises her hand and pointer in synchrony with a crescendo, *accelerando* and a rising quartal in the melody sung by the therapist (Figure 3: rectangle phase E; Video 2:01–2:09).

Not only did interactional synchrony, understood as a simultaneous way of sharing, emerge as a category of interaction. First, minimal and subtle forms of *interplay* and *dialogue* between the therapist and premature infant also were identified via analysis of the music therapy session with Melike. For example, after being highly attentive, as seen in phase B (Figure 3: underlined phase B; Video 2: 0:17–0:35), Melike *reacts* at the end of the musical phrase with smooth and expressive arm and finger movements similar to conducting movements in a more interplaying, responsive form of sharing communicative musicality (Figure 3: underlined bar 21/22; Video 2: 0:58–1:00). Furthermore, from the end of phase D, she lifts her eye(lid)s, eyebrows and wrinkles her forehead repeatedly at the end of the musical phrase (Figure 3: rectangle phases D–F; Video 2: 1:44–2:25). This behaviour is categorized as face open by Als (1995) and argued as self-regulatory response indicative of the infant processing the stimulation in a manner that is receptive to continuation (Als, 1995). It is interpreted as a subtle form of dialogue, a calling on the therapist to go on, which is in line with the author's notes on the memo of that particular session: "I wanted to come to an end, but Melike lifted her eyelids at the end of my phrases, which I interpreted as a request to go singing; so I went on singing."

Masking of noise

According to the data, another consequence that can arise as a result of a therapist's responsiveness towards an infant *and* the environment, as well as a result of the premature infant's experience of shared communicative musicality, is the identified category of masking background noise (Figure 4).

For instance, Melissa does not startle after a loud beep of the monitor in bar 13, in contrast to her frequent startling after loud beeps during routine care noted in the author's memos and protocols (Figure 2: arrow bar 13; Video 1:02–1:07).

It is possible to hypothesize that the background noise is masked due to the tonal attunement and overriding integration of the beep into the responsive process of the therapist's improvised singing. The beep sounds out on a major sixth, as the therapist responds with a *ritardando* and *fermata*. The therapist then resolves the harmonic tension by leading onto the keynote of B major with *glissando* when the beeping ends. Thereby, the shrill beep may not be experienced as such a sudden, overwhelming and frightening stimulus, but rather as a more tonally and harmonically prepared, integrated and resolved stimulus. On the other hand, it is possible to hypothesize that Melissa does not startle during or after the beep, because she is so focused on the music therapy, so that in her individual perception the beeping noise fades into the background.

Empowerment of the premature infant

When the categories of premature infant behaviours from both video examples were listed, they fell cleanly into one overriding category: *empowerment*. This

Music therapy session with Melissa

by Hasbeek, F.

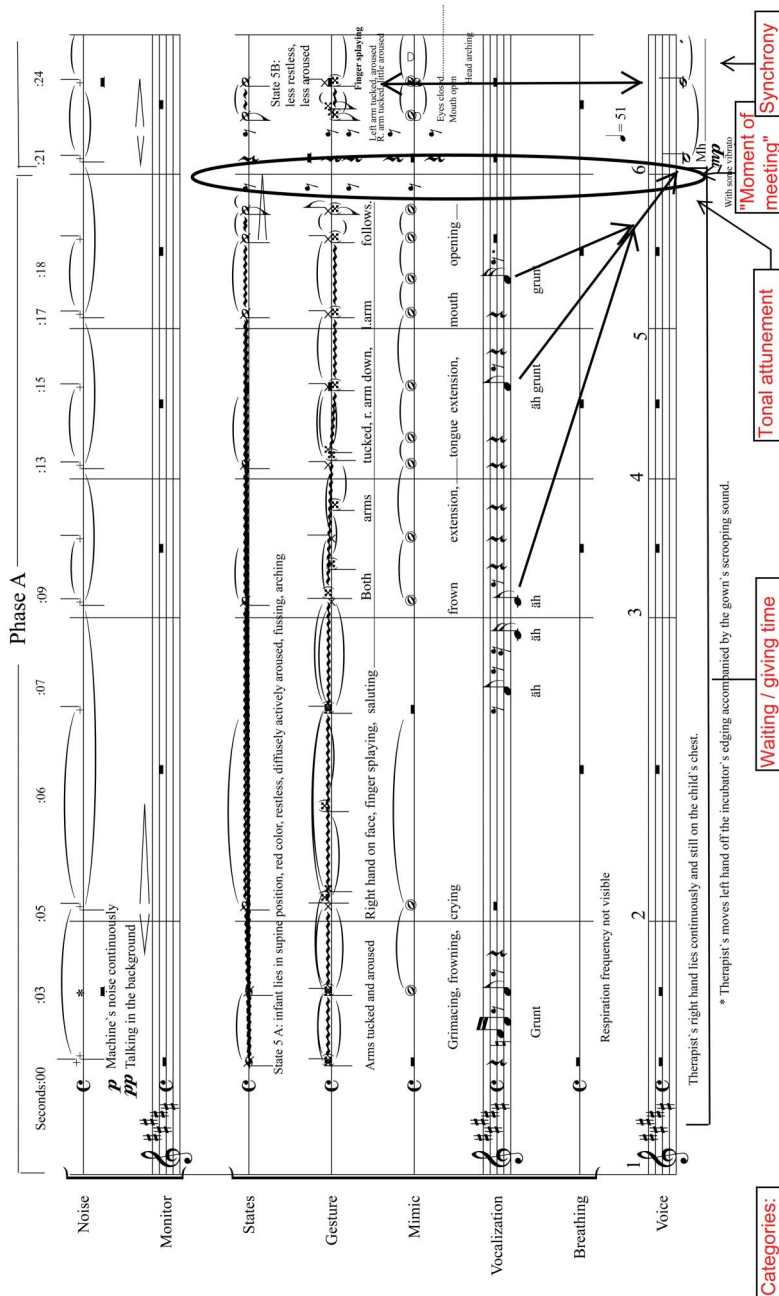


Figure 2. Transcript for Melissa.



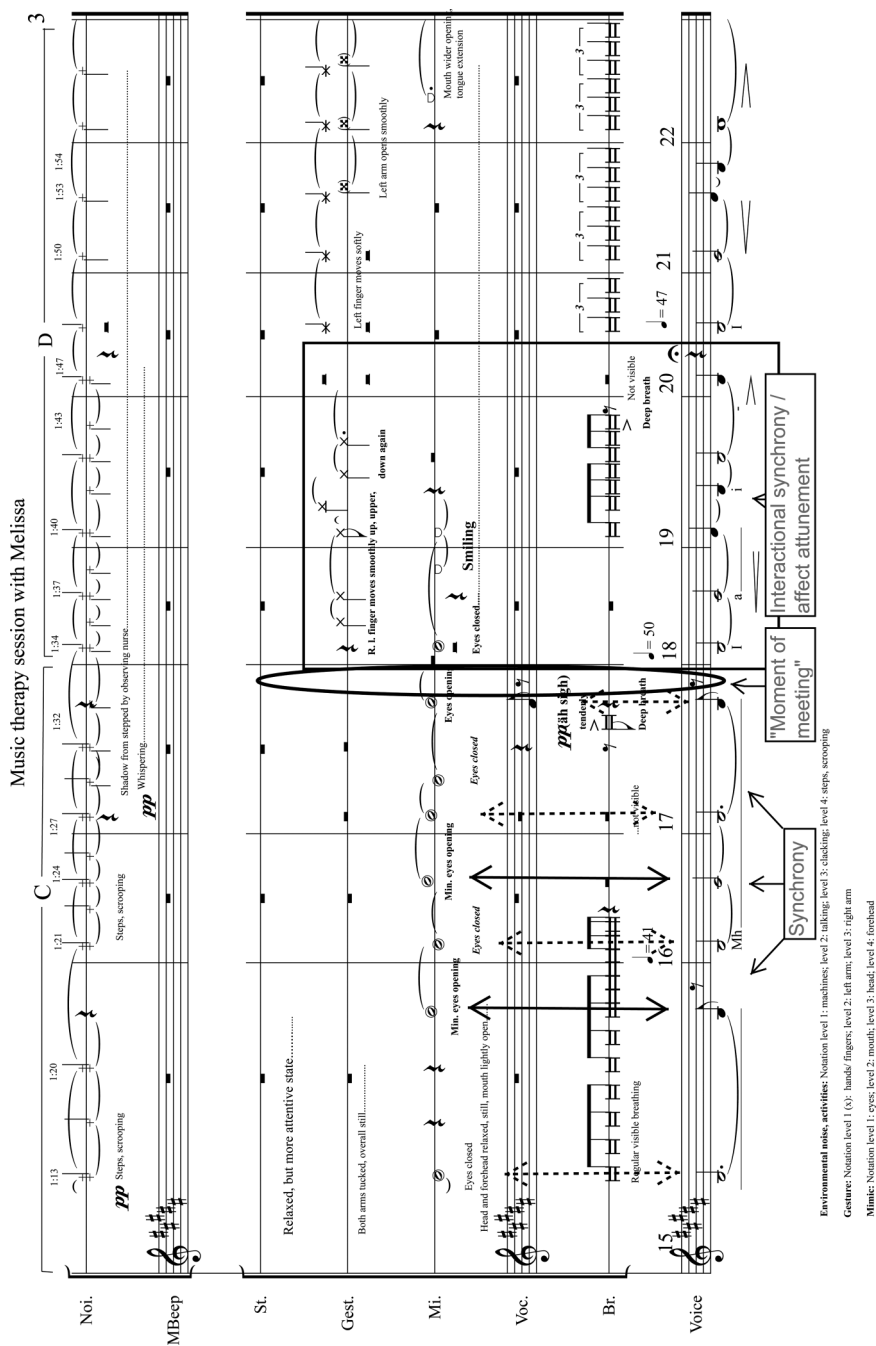


Figure 2. (Continued).

Music therapy session with Melike

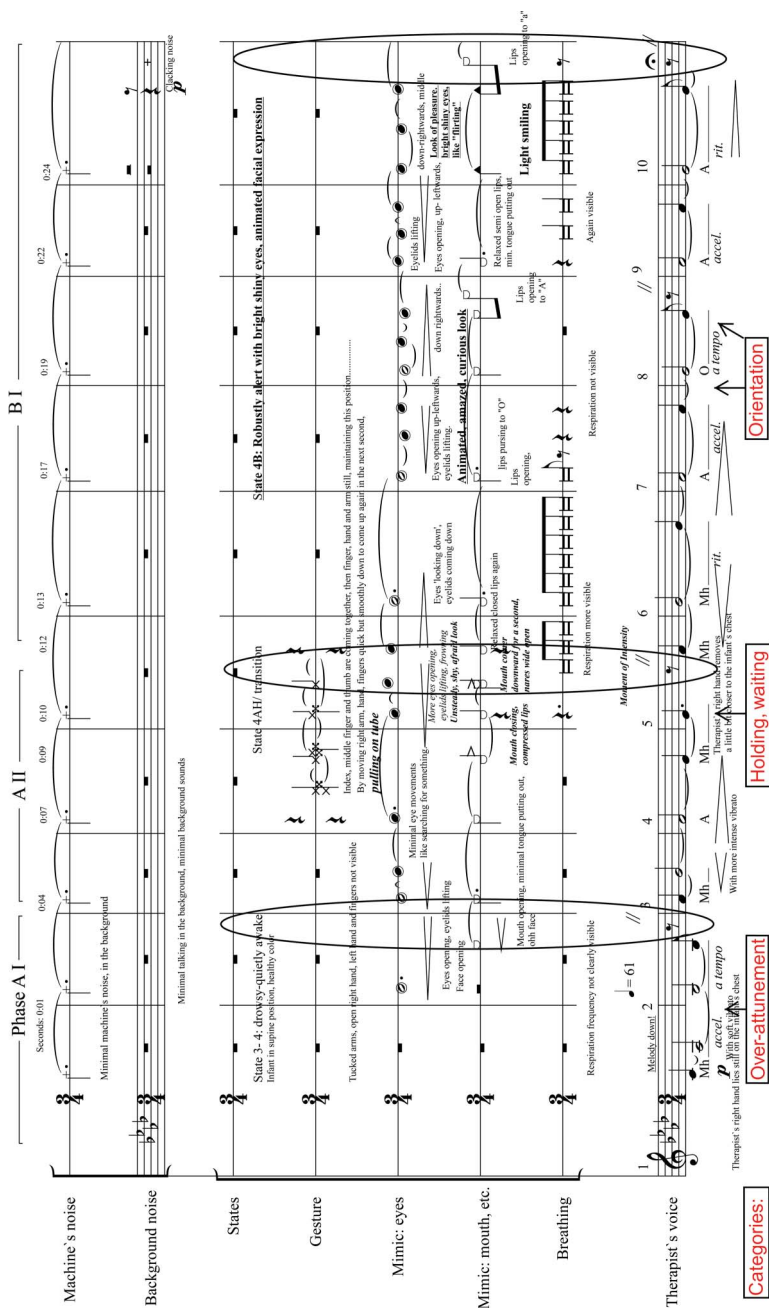


Figure 3. Transcript for Melike.



Music therapy session with Melike

5

M.noise

B.noise

States

Gesture

Mimic e.

Mimic m.

Breathing

Voice

2:13 2:16 2:19 2:22 2:26 2:29 2:32

F

pp

p

Chair's rumbling from cleaning

More and more drowsy but still a little bit alert state (state 3-4)

Larm moves min.

R. arm minimal startling

Eyes semi open....

eyes opening

petals lifting closing

semiclosed

Min. frowning

Min. tongue ext., min. smiling, in. tongue ext.

Clacking noise from wiping

Clacking noise

45 46 47 48 49 50 51

a tempo

"Dialogue"

Figure 3. (Continued).

category is seen as a consequence of all the other categories described above. *Empowerment* is understood in the sense of letting the power out, to help the premature infant to discover and use its innate ability to regulate, orientate and engage (Funnel, 2004) (Figure 4).

These two stressed, prematurely-born infants were able to *calm down* and *relax* using their ability to *regulate*, as already mentioned above in the category of interactional synchrony (Figure 2: development of states; whole Video 1; Figure 3: development from phase CI to CII; Video 2: 0:59–1:15). This relaxation is also vaguely perceptible in the momentary and increasingly regular and slower breathing patterns (as defined by Als, 1995) of both infants over the course of music therapy (noted in both transcripts and videos). This is consistent with the session protocols and notes on both therapy sessions, in which the development of more stable physiological monitor parameters was noted and confirmed by another mother observing the monitor during therapy.

Through unfolding communicative musicality, premature infants may begin to *orientate* in time, in pulse, in space, in relationships, and in their own physiological and emotional apperceptions. This can be seen in the episode with Melissa in phase C, when she starts to open her eyes during interactional synchrony, beginning to seem aware, curious about what is going on, as already described (Figure 2: arrows phase C; Video 1: 0:56–1:33). This *orientation* becomes even clearer in the example with Melike, when she starts to open her eyes with an animated, curious, seeking look (Figure 3: underlined phase BI; Video 2: 0:17–0:35).

Both infants begin to *participate* and *engage* in the therapeutic process, as noted above, via mimicry, gestures, and even some vocalization in moments of interactional synchrony (Figure 2: arrows phase C; Video 1: 1:21–1:33). While Melissa smiles very subtly, Melike smiles twice in these moments of self- and interactional synchrony (Figure 3: rectangle, phase BII; Video 2: 0:37–0:43; Figure 3: rectangle, phase E; Video 2: 2:02–2:09).

Empowerment is represented as the infants being *expressive* and *creative*. Whereas in the example with Melissa these capabilities remain vaguely perceptible, first forms of *expression* and *creativity* can be more clearly observed in the example with Melike, when she *conducts* the therapist's singing by smoothly moving her arm and fingers (Figure 3: underlined bar 21/22; Video 2: 0:57–1:00).

Empowerment means developing self-determination, having the opportunity to *initiate* and *guide*. Whereas in the example with Melissa, in this sub-category these capabilities are again just vaguely perceptible, in the example with Melike, animating and guiding tendencies can be seen in her eye(lids) elevations at the end of musical phrases, as mentioned above from phase D through to the end of the episode (Figure 3: rectangle, phase D–F; Video 2: 1:44–2:25).

Limitations of music therapy

Ultimately, limitations of CMT in the NICU must be addressed. Analysis revealed that there is always the potential danger of over-stimulating the

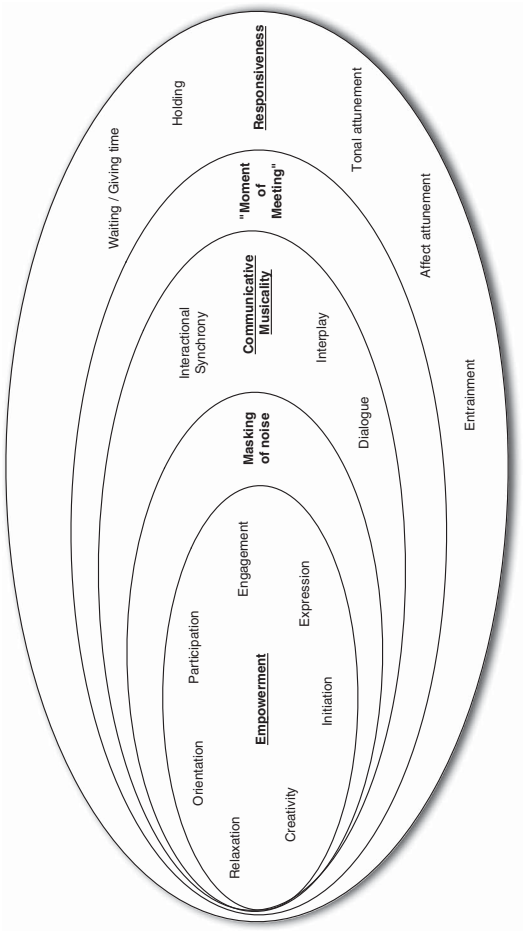


Figure 4. Logic diagram of categories.
Inspired by Sorensen, (2012, p. 80).

premature infant, particularly in moments of upcoming distress, as observed when Melike pulled on her nose tube (Figure 3: italics bar 22; Video 2: 01–1:05). When premature infants are too aroused or too unstable, even very subtle stimulation like music therapy may be contraindicated. In this case, it is better to wait, as seen with Melissa (Figure 2, phase A), or even to delay the entire therapy session, as noted in the author's memos.

Discussion

The working hypothesis was that premature infants, as early as 32 weeks of gestation, are capable of and motivated to engage in the process of creative music therapy. On the one hand, it appears that the phenomenon of music itself is a highly effective medium in which premature infants can communicate. On the other hand, therapeutic responsiveness *and* communicative musicality using live music as performance may be particularly effective at motivating, engaging and empowering the premature infant. By matching and sharing vitality forms in a continuously finely-attuned musical process, infants are not overwhelmed by the stimulus of musical activity.

This hypothesis may be discussed in terms of the premature infant's pacification, since this is a predominant goal in neonatal care, as many premature infants struggle with arousal and stress that can have a variety of adverse effects on their outcomes, including increased difficulties with breathing and cardiovascular instability. The present results are congruent with many research outcomes which demonstrate that music therapy may be especially beneficial to pacify premature infants and promote such infants' self-regulation (Haslbeck, 2012a; Standley, 2002).

The process of pacification may occur via the intrinsic sedative qualities of music, when a slow or steadily slowing tempo is chosen, as well as a low pitch, a simple, predictable and flowing melody, harmonies, and repetition (Hanson-Abromeit, 2006; Loewy, Hallan, Friedmann, & Martinez, 2005; Walworth, 2005). Music itself is concerned with the capacity of regulation and seems to be especially appropriate as a therapeutic medium for distressed premature infants, as "intense human interest in music is evident from the early days of life" (Trehub, 2003, p. 669); for example, due to music's intrinsic capacity towards "sharing feelings and experiences" (Aldridge, 1996; Trehub, 2003 p. 672).

One can also hypothesize that the pacification observed herein occurred especially because of the musical entrainment of the therapist to the premature infants' rhythms and the developing interactional synchrony inherent to the music therapy process. Or, as Salomonsson (2011) described, it is the communicative musicality which soothes the baby (Ansdell et al., 2010).

A distressed premature infant in an overwhelming, arrhythmic intensive care environment is out of tune, out of regulation, and out of rhythm, when considered in terms of a *displaced foetus*, disconnected from maternally regulating chronobiological rhythms and struggling against potential over-arousal (Als &

Gilkerson, 1997; Fischer & Als, 2004). Hence, attuned, entrained, and synchronized infant-directed singing may help the premature infant to get back in tune, in rhythm, in mutual regulation, in self-synchrony and interactional synchrony. It may help the infant to breathe more regularly and to coordinate its still minimal movements. Aldridge (1996, p. 57) suggests that “at a fundamental level, human activity is organized as a hierarchy of rhythmic entrainment”. In the words of Trevarthen (2008, p. 18): “Infants are born with the sense of this time in movement, an Intrinsic Motive Pulse (IMP) that enables them to synchronize with the impulses in the action of an affectionate parent’s voice and gesture, that seeks to improvise a “synrhythmic” proto-conversation.”

This corresponds to the findings of *breathing* stuffed-bear studies, which suggest that entrainment of the premature infant’s breathing rhythm to the stuffed bear’s breathing rhythm may serve as a primary source of their relaxation and more regular breathing (Ingersoll & Thoman, 1994; Thoman & Graham, 1986; Thoman et al., 1991). Furthermore, the roles of entrainment and synchronization are already identified in music therapy literature, by several authors, as a regulation factor for various older patient groups (Aldridge, 1996; Malloch & Trevarthen, 2009; Schumacher & Calvet, 2008).

Interestingly, the premature infant may not only be capable of achieving rhythm, self-regulation and, therefore, relaxation through this synchronization, but also of becoming motivated to orientate, participate and engage in, and through, communicative musicality. This motivation to seek contact through rhythmic entrainment is also supported by the findings of the breathing bear studies (Ingersoll & Thoman, 1994; Thoman & Graham, 1986; Thoman et al., 1991). However, the present results indicate that this process is not only characterized by simultaneous sharing of rhythms, but also by the sharing of vitality forms and initial and subtle forms of dialogue and interplay. These results are congruent with the findings of Trevarthen (2008), who observed a girl born two months prematurely responding dialogically and with skill to her father’s imitations to her simple vocalizations during kangarooing.⁴

Premature infants may be motivated to engage in situations of interrelating, due to the subtle opportunity of self-determination, creativity and expression inherent in CMT. This supports research by Thoman and Graham (1986), who found that a premature infant’s opportunity to self-regulate stimulation was more effective, in terms of quantity of quiet sleep, than the same stimulation administered in a predetermined way. According to Aldridge (1996, p. 57), this motivation is based upon the creative qualities and needs of the human being that promote health and autonomy.

In the present study, all the afore-mentioned aspects of empowerment took place within the context of a musical relationship. The premature infant is seen as a social being (Als, Tronick, Lester, Brazelton, 1977; Buber, 1958), since the

⁴During kangarooing, the premature infant is held skin-to-skin on their parent’s chest to provide physiological and psychological warmth and bonding.

newborn infant (and thus also the premature infant) depends on others to construct his own structure, and requires “regulatory input from others to sustain even basic homeostatic and physiological processes” (Ham & Tronick, 2009 p. 621) and to develop himself through reciprocal affect attunement that evolves between human beings (Papousek, 2012; Schore, 2003; Stern, 2010b). Hence, the shared vitality forms of improvised live music, as seen in both sample therapy sessions, act like the intuitive affect attunement of a healthy parent–infant performance, since this communicative event is highly musical and improvisational in nature (Lenz & von Moreau, 2004; Malloch & Trevarthen, 2009; Papousek & Papousek, 1991; Pavlicevic, 2000; Trondalen & Skarderud, 2007). However, the present performance in music therapy takes place in the relatedness between the premature infant and the therapist, condensed in musical relatedness – the music therapy process itself with its “moments of meetings, relational moves, repairs and moving along” (Stern, 2010a, p.13).

In particular, the component of condensing seems to be of importance (Ansdell et al., 2010). As seen in both examples, the non-invasive shared vitality forms inherent to the music therapy process took place in just two minutes, as did therapeutic change. This potential for therapeutic change in such a short timespan is of relevance, since the vulnerable and fragile premature infant is always at risk of being overwhelmed; for example, by prolonged interventions (Als, 1983; Hanson-Abromeit et al., 2008; Standley & Walworth, 2010).

Another risk factor for overwhelming the premature infant is environmental noise, as already detailed in the present Results section and in the literature. The neonatal setting is characterized by sensory mismatches for the premature infant’s developing nervous system, with potentially detrimental short- and long-term consequences for the infant, such as hearing loss (Als, 2009; American Academy of Pediatrics, 1997; Graven, 2000; Philbin, 2000). Therefore, it can be hypothesized that CMT might not only act as a treatment approach, but also as a preventive approach in neonatal care, by helping to mask noise and, thus, reduce acute physiological stress disorders as well as possible long-term disabilities (Anand & Scalzo, 2000; Barre, Morgan, Doyle, & Anderson, 2011).

Ultimately, our findings draw attention to the need for therapist responsiveness, which may be a basic requirement for CMT in neonatal care. The therapist must demonstrate therapeutic empathy, flexibility, creativity, sensitivity and experience (Stern et al., 1998). This is in line with the results of a qualitative study by Shoemark and Grocke (2010), as well as the requirements of the Newborn Individualized Developmental Care and Assessment Program (NIDCAP), defined by Als and Gilkerson (Als & Gilkerson, 1997, p. 184). In that programme, the authors call for highly attuned and individualized approaches in neonatal care, characterized by a mind flexible enough to continuously assess the infant’s needs and creatively adjust the intervention provided.

Interestingly, tonal attunement of the therapist to the environment and the infant’s grunts was fully discovered only through micro analysis. During the

analysed sessions, the therapist selected the key in which to sing more intuitively than consciously. Since the results show that such tonal attunement may facilitate the masking of noise, music therapists working in neonatal care units might consider becoming better acquainted with this therapeutic technique and utilize it more intentionally in the future.

Conclusions

The results of this microanalysis provide a set of preliminary categories through which a deeper understanding of the therapeutic process of creative music therapy in neonatal care may be gained. For the premature infant, CMT may encourage an active role and may unfold communicative musicality, since premature infants already seem to possess sensitivity to music and first forms of communication and meaningful relationships that can be utilized for development. Naturally, all this takes place in a most subtle manner.

The minimal tendencies of dialogue and initiation, as well as the hypothesis that relaxation occurs through interactional synchrony of tension, must be further elucidated within a follow-up study, as smiling in premature infants has been argued to be more internally driven than externally shaped (Kawakami, 2007). A study of cases with prematurely born infants with a broad range of social and diagnostic diversity is needed, as well as cases in which music therapy has been viewed as of only limited effectiveness. This should help to identify the limits of music therapy and also the potential dangers of overwhelming these fragile human beings.

Our results also lead to the hypothesis that, via the communicative and creative processes of CMT, the medical necessity of isolating premature infants can be somewhat counter-acted. With CMT, the premature infant may experience increased opportunities for contact. In addition, the overwhelmed and disoriented infant may experience regulation and orientation, leading to a positive perceptions and healthy development. Based upon the findings described here, CMT with premature infants cannot be a predetermined manual- or procedure-driven approach. It must be an individualized observation- and relationship-based decision-making process in music, which seeks to stimulate adequately without overwhelming, and which aims to further the premature infant's own development, as postulated for interventions in neonatal care by Als and Gilkerson 15 years ago (1997).

Ultimately, in future investigations, parental perspective must be included, since CMT in the NICU is an integrative triadic approach for both the infants *and* the parents to support intuitive parent-child-interactions and bonding, as well as the parents' sense of empowerment (Edwards, 2011a; Haslbeck, 2011); for example, by "translating infant-directed singing into a strategy for the hospitalized family" (Shoemark, 2011, p. 161).

In conclusion, the goals of neonatal intensive care have changed in recent decades, from merely ensuring infant survival to also optimizing a premature infant's

quality of life and development. It is seen that this development is substantially influenced by the nature and quality of interpersonal emotional experiences (Als & Gilkerson, 1997); and creative music therapy offers a promising, non-invasive therapeutic approach that directly addresses emotionally-expressive, intersubjective functions in premature infants.

Acknowledgements

I gratefully acknowledge the participating premature infants and their parents for their support in carrying out this study and the interdisciplinary team of the project clinics to view and discuss video footage. Special thanks go to the four external analysts, Dr Ursula Weller, Dr Simon Gilbertson, Anne Markmann and Markus Wentz and for their constructive validation of the transcripts and the results. I thank Professor Dr D. Aldridge for his support as my doctoral supervisor and my husband, Dr J. Haslbeck, for his scientific and personal support. Simon Gilbertson also read and commented on the manuscript, for which I am grateful. This publication was supported in part by the German foundation *Evangelische Studienstiftung Villigst*. Parts of the material of this article were presented inter alia at the 12th World Congress of the World Association for Infant Mental Health, Leipzig, Germany, in July 2010 and at the 13th World Congress of Music Therapy in Seoul, Korea, July 2011.

Notes on contributor

Friederike Haslbeck, DMtG, Master of music education, Master of music therapy, specially trained in NICU music therapy, has implemented music therapy service in two German hospitals and is currently completing a PhD with Professor Dr. David Aldridge on "Creative music therapy with premature infants and their parents" at the University Witten/Herdecke, Faculty of Medicine, Germany; funded by the German foundation *Evangelische Studienstiftung Villigst*.

References

- Abromeit, D.H. (2003). The Newborn Individualized Developmental Care and Assessment Program (NIDCAP) as a model for clinical music therapy interventions with premature infants. *Music Therapy Perspectives*, 21(2), 60–68.
- Aldridge, D. (1996). *Music therapy research and practice in medicine: From out of the silence*. London: Jessica Kingsley.
- Aldridge, D. (2005). *Case study designs in music therapy research*. London: Jessica Kingsley.
- Aldridge, D., & Aldridge, G. (1996). A personal construct methodology for validating subjectivity in qualitative research. *The Arts in Psychotherapy*, 23, 225–236.
- Aldridge, D., & Aldridge, G. (2002). Therapeutic narrative analysis: A methodological proposal for the interpretation of music therapy traces. *Music Therapy Today (online)*, 02(Dec.). Retrieved from <http://musictherapyworld.net/modules/mmmagazine/issues/20021205144406/20021205150303/TherapeutNarrativeAnalysis.pdf>
- Aldridge, D., Gustorff, D., & Hannich, H.J. (1990). Where am I? Music therapy applied to coma patients. *Journal of the Royal Society of Medicine*, 83, 345–346.
- Als, H. (1983). Toward a synactive theory of development: Promise for the assessment and support of infant individuality. *Infant Mental Health Journal*, 3(4), 229–243.

- Als, H. (1995). *Manual for the naturalistic observation of newborn behavior: Newborn Individualized Developmental Care and Assessment Program (NIDCAP)*. Bosto, MA: Harvard Medical School.
- Als, H. (2009). NIDCAP: Testing the effectiveness of a relationship-based comprehensive intervention. *Pediatrics*, 124, 1208–1210.
- Als, H., & Gilkerson, L. (1997). The role of relationship-based developmentally supportive newborn intensive care in strengthening outcome of preterm infants. *Seminars in Perinatology*, 21(3), 178–189.
- Als, H., Butler, S., Kosta, S., & McNulty, G. (2005). The Assessment of Preterm Infants' Behavior (APIB): Furthering the understanding and measurement of neurodevelopmental competence in preterm and full-term infants. *Mental Retardation and Developmental Disabilities Research Reviews*, 11, 94–102.
- Als, H., Duffy, F.H., McNulty, G.B., Rivkin, M.J., Vajapeyam, S., Mulkern, R. V., et al. (2004). Early experience alters brain function and structure. *Pediatrics*, 113, 846–857.
- Als, H., Tronick, E., Lester, B.M., & Brazelton, T.B. (1977). The Brazelton Neonatal Behavioral Assessment Scale (BNBAS). *Journal of Abnormal Child Psychology*, 5(3), 215–231.
- American Academy of Pediatrics. (1997). Noise: A hazard for the fetus and newborn. Committee on Environmental Health. *Pediatrics*, 100, 724–727.
- Anand, K.J.S., & Scalzo, F.M. (2000). Can adverse neonatal experiences alter brain development and subsequent behavior? *Biology of the Neonate*, 77(2), 69–82.
- Ansdell, G., & Pavlicevic, M. (2010). Practicing “gentle empiricism” – the Nordoff Robbins heritage. *Journal of Music Perspectives*, 28(2), 131–139.
- Ansdell, G., Davidson, J., Magee, W.L., Meehan, J., & Procter, S. (2010). From “This F***ing life” to “that’s better” ... in four minutes: an interdisciplinary study of music therapy’s “present moments” and their potential for affect modulation. *Nordic Journal of Music Therapy*, 19, 3–28.
- Arnon, S., Shapsa, A., Forman, L., Regev, R., Bauer, S., Litmanovitz, I., et al. (2006). Live music is beneficial to preterm infants in the neonatal intensive care unit environment. *Birth*, 33(2), 131–136.
- Barre, N., Morgan, A., Doyle, L.W., & Anderson, P.J. (2011). Language abilities in children who were very preterm and/or very low birth weight: A meta-analysis. *The Journal of Pediatrics*, 158, 766–774.
- Baum, N., Weidberg, Z., Osher, Y., & Kohelet, D. (2012). No longer pregnant, not yet a mother. [02. Empirische Studie – Qualitativ]. *Journal of Qualitative Health Research*, 22, 595–606.
- Browne, J.V., & Talmi, A. (2005). Family-based intervention to enhance infant–parent relationships in the neonatal intensive care unit. *Journal of Pediatric Psychologie*, 30, 667–677.
- Buber, M. (1958). *I and thou* (2nd ed.). New York, NY: Charles Scribner’s Sons.
- Creswell, J.W. (2007). *Qualitative inquiry & research design. Choosing among five approaches* (2nd ed.). London: Sage.
- Denzin, N.K. (2003). Reading film – Filme und Videos als sozialwissenschaftliches Erfahrungsmaterial. [Reading film – films and videos as social-scientific experience material]. In U. Flick, E. von Kardoff & I. Steinke (Eds.), *Qualitative Forschung. Ein Handbuch [Qualitative research. A handbook]* (Vol. 2, pp. 416–428). Reinbek bei Hamburg: Rowohlt Taschenbuch Verlag.
- Edwards, J. (2011a). The use of music therapy to promote attachment between parents and infants. *The Arts in Psychotherapy*, 38, 190–195.
- Edwards, J. (Ed.). (2011b). *Music therapy and parent–infant bonding*. Oxford: Oxford University Press.

- European Foundation for the Care of Newborn Infants. (2009/2010). *EU benchmarking report 2009/2010. Too little, too late? Why Europe should do more for preterm infants*. Karlsfeld, Germany: European Foundation for the Care of Newborn Infants.
- Field, T., Hernandez-Reif, M., Feijo, L., & Freedman, J. (2006). Prenatal, perinatal and neonatal stimulation: A survey of neonatal nurseries. *Infant Behavior & Development*, 29, 24–31.
- Fischer, C.B., & Als, H. (2004). Trusting behavioral communication. Individualized relationship-based developmental care in the newborn intensive care unit – a way of meeting the neurodevelopmental expectations of the preterm infant. In M. Nöcker-Ribaupierre (Ed.), *Music therapy for premature and newborn infants* (pp. 1–19). Gilsum: Barcelona.
- Flyvbjerg, B. (2006). Five misunderstandings about case-study research. *Quality Inquiry*, 12, 219–245.
- Funnel, M.M. (2004). Patient empowerment. *Critical Care Nursing Quarterly*, 27, 201–204.
- Gilbertson, S., & Aldridge, D. (2008). *Music therapy and traumatic brain injury. A light on a dark night*. London: Jessica Kingsley.
- Graven, S.N. (2000). Sound and the developing infant in the NICU: Conclusions and recommendations for care. *Journal of Perinatology*, 20, 88–93.
- Ham, J., & Tronick, E. (2009). Relational psychophysiology: Lessons from mother–infant physiology research on dyadically expanded states of consciousness. *Psychotherapy Research*, 19, 619–632.
- Hanson-Abromeit, D. (2006). *Developmentally based criteria to support recorded music selections by neonatal nurses for use with premature infants in the neonatal intensive care unit* (Unpublished doctoral dissertation). University of Kansas, Kansas.
- Hanson-Abromeit, D., Shoemark, H., & Loewy, J. (2008). Music therapy with pediatric units: Newborn intensive care unit (NICU). In D. Hanson-Abromeit & C. Colwell (Eds.), *Medical music therapy for pediatrics in hospital settings. Using music to support medical interventions* (pp. 15–69). Silver Spring, MD: AMTA.
- Haslbeck, F. (2004). Music therapy with preterm infants – theoretical approach and first practical experience. *Music Therapy Today*, 05(4). Retrieved from http://musictherapyworld.net/modules/mmmagazine/issues/20040727092613/20040727094302/MTT5_4_Haslbeck.pdf
- Haslbeck, F. (2010a). International Summit of Music Therapy in the NICU: First sounds: (RBL) rhythm, breath and lullaby, 2–4 August 2010. *Musiktherapeutische Umschau, online*. http://www.musiktherapie.de/fileadmin/user_upload/medien/pdf/arbeitskreise/DMTG-online-summitbericht_Rev_PK.pdf
- Haslbeck, F. (2010b). Music therapy with premature infants: Insights into systematic review findings and practical approaches. *Infant Mental Health Journal*, 32 (Supplement), 36.
- Haslbeck, F. (2011). Musik als Therapie auf der Frühgeborenenstation [Music as therapy in the neonatal intensive care unit]. *Monatsschrift Kinderheilkunde*, 159(Supplement 3), 161–162.
- Haslbeck, F. (2012a). Music therapy for premature infants and their parents: An integrative review. *Nordic Journal of Music Therapy*, 21(3), 203–226. DOI: 10.1080/08098131.2011.648653
- Haslbeck, F. (2012b). Towards a methodology to explore active music therapy with premature infants and their parents. *Music and Medicine*, 4(4), 205–214.
- Holck, U. (2007). An ethnographic descriptive approach to video microanalysis. In T. Wosch & T. Wigram (Eds.), *Microanalysis in music therapy. Methods, techniques and applications for clinicians, researchers, educators and students* (pp. 29–40). Philadelphia, PA: Jessica Kingsley.

- Holloway, I. (1997). *Basic concepts for qualitative research*. Oxford: Blackwell Science.
- Ingersoll, E.W., & Thoman, E.B. (1994). The breathing bear: Effects on respiration in premature infants. *Physiology & Behavior*, 56, 855–859.
- Jacobs, C.D. (2005). *Managing organizational responsiveness – toward a theory of responsive practice*. Wiesbaden: Deutscher Universitätsverlag.
- Jotzo, M., & Poets, C.F. (2005). Helping parents cope with the trauma of premature birth: An evaluation of a trauma-preventive psychological intervention. *Pediatrics*, 115, 915–919.
- Lenz, G., & von Moreau, D. (2004). Coming together – resonance and synchronization as a regulating factor in relationships. In M. Nöcker-Ribaupierre (Ed.), *Music therapy for premature and newborn infants* (pp. 67–81). Gilsum, NH: Barcelona.
- Loewy, J. (2011). Music therapy for hospitalized infants and their parents. In J. Edwards (Ed.), *Music therapy and parent–infant bonding* (pp. 179–190). Oxford: Oxford University Press.
- Loewy, J., Hallan, C., Friedmann, E., & Martinez, C. (2005). Sleep/sedation in children undergoing EEG-testing: A comparison of chloral hydrate and music therapy. *Journal of Perinatal Anesthesia Nursing*, 20(5), 323–332.
- Kawakami, K., Kawakami-Takai, K., Tomonaga, M., Suzuki, J., Kusaka, F., & Okai, T. (2007). Spontaneous smile and spontaneous laugh: An intensive longitudinal case study. *Infant Behavior & Development*, 30, 146–152.
- Malloch, S., & Trevarthen, C. (Eds.). (2009). *Musicality: Communicating the vitality and interests of life*. Oxford: Oxford University Press.
- Nöcker-Ribaupierre, M. (Ed.). (2004). *Music therapy for premature and newborn infants*. Gilsum, NH: Barcelona.
- Nordoff, P., & Robbins, C. (1977). *Creative music therapy: Individualized treatment for the handicapped child*. New York, NY: John Day.
- Papousek, M. (2012). Resilience, strenghts, and regulatory capacities: Hidden resources in developmental disorders of infant mental health. *Infant Mental Health Journal*, 32(1), 29–46.
- Papousek, M., & Papousek, H. (1991). The meanings of melodies in motherese in tone and stress languages. *Journal of Infant Behavior & Development*, 14, 415–440.
- Pavlicevic, M. (2000). Improvisation in music therapy. *Journal of Music Therapy*, XXXVII (4), 269–285.
- Philbin, M.K. (2000). The influence of auditory experience on the behavior of preterm newborns. *Journal of Perinatology*, 20(8 Pt 2), 76–87.
- Polit, D.F., & Beck, C.T. (2004). *Nursing research: Principles and methods* (Vol. 7). Philadelphia, PA: Lippincott.
- Robbins, C. (2005). *A journey into creative music therapy*. Gilsum, NH: Barcelona.
- Robson, C. (2002). *Real world research* (Vol. 2). Oxford: Blackwell.
- Salomonsson, B. (2011). The music of containment: Addressing the participants in mother–infant psychoanalytic treatment. *Infant Mental Health Journal*, 32(6), 599–612.
- Schlez, A., Litmanovitz, I., Bauer, S., Dolfen, T., Regev, R., & Arnon, S. (2011). Combining kangaroo care and live harp music therapy in the Neonatal Intensive Care Unit Setting. *Israel Medical Association Journal*, 13, 354–358.
- Schore, A.N. (2003). Minds in the making: Attachment, the self-organising brain, and developmentally oriented psychoanalytic psychotherapy. In J.C.H. Wilkinson (Ed.), *Revolutionary connections: Psychotherapy & neuroscience* (pp. 7–52). London: Karnac.
- Schumacher, K., & Calvet, C. (2008). *Synchronisation: Musiktherapie bei Kindern mit Autismus* [Synchronization: Music therapy with children on the autistic spectrum]. Göttingen: Vandenhoeck & Ruprecht.

- Shoemark, H. (2011). Translating “infant-directed singing” into a strategy for the hospitalized family. In J. Edwards (Ed.), *Music therapy and parent–infant bonding* (pp. 161–178). Oxford: Oxford University Press.
- Shoemark, H., & Grocke, D. (2010). The markers of interplay between the music therapist and the high risk full term infant. *Journal of Music Therapy*, XLVII(4), 306–334.
- Sorensen, K., Broucke, S.V., Fullam, J., Doyle, G., Pelikan, J., Slonska, Z., Brand, H. (2012). Health literacy and public health: A systematic review and integration of definitions and models. *BMC Public Health*, 12(1), 80.
- Standley, J.M. (2002). A meta-analysis of the efficacy of music therapy for premature infants. *Journal of Pediatric Nursing*, 17(2), 107–113.
- Standley, J.M., & Walworth, D. (2010). *Music therapy with premature infants. Research and developmental interventions* (2nd ed.). Silver Spring, MY: The American Music Therapy Association.
- Stern, D.N. (2010a). *Forms of vitality*. Oxford: Oxford University Press.
- Stern, D.N. (2010b). The issue of vitality. *Nordic Journal of Music Therapy*, 19(2), 88–102.
- Stern, D.N., Process of Change Study Group B., Massachusetts, Bruschiweiler-Stern, N., Harrison, A., Lyons-Ruth, K., Morgan, A., et al. (1998). The process of therapeutic change involving implicit knowledge: Some implications of developmental observations for adult psychotherapy. *Infant Mental Health Journal*, 19, 300–308.
- Strauss, A.L., (1994). *Grundlagen qualitativer Sozialforschung* [Basics of qualitative empirical social research]. München: Wilhelm Fink Verlag.
- Strauss, A.L. & Corbin, J. (Eds.). (1998). *Grounded theory methodology. An overview*. London: Sage.
- Teckenberg-Jansson, P., Huotilainen, M., Pölkki, T., Lipsanen, J., & Järvenpää, A.-L. (2011). Rapid effects of neonatal music therapy combined with kangaroo care on prematurely-born infants. *Nordic Journal of Music Therapy*, 20(1), 22–42.
- Thoman, E.B., & Graham, S.E. (1986). Self-regulation of stimulation by premature infants. *Pediatrics*, 78, 855–860.
- Thoman, E.B., Ingersoll, E.W., & Acebo, C. (1991). Premature infants seek rhythmic stimulation, and the experience facilitates neurobehavioral development. [03. Empirische Studie – Quantitativ]. *Journal of Developmental & Behavioral Pediatrics*, 12(1), 11–18.
- Trehub, S.E. (2003). The developmental origins of musicality. *Nature of Neuroscience*, 6, 669–673.
- Trevarthen, C. (2008). The musical art of infant conversation: Narrating in the time of sympathetic experience, without rational interpretation, before words. *Musicæ Scientiæ*, (Special Issue), 15–46.
- Trondalen, G., & Skarderud, F. (2007). Playing with affects and the importance of “affect attunement”. *Nordic Journal of Music Therapy*, 16(2), 100–111.
- Walworth, D. (2005). Procedural-support music therapy in the healthcare setting: A cost-effectiveness analysis. *Journal of Pediatric Nursing*, 20(4), 276–284.
- Whipple, J. (2000). The effect of parent training in music and multimodal stimulation on parent–neonate interactions in the neonatal intensive care unit. *Journal of Music Therapy*, 37(4), 250–268.
- Wosch, T., & Wigram, T. (Eds.). (2007). *Microanalysis in music therapy: Introduction in theoretical basis*. Philadelphia, PA: Jessica Kingsley.