Chapter 13
Sounding Together: Family-Centered Music Therapy as Facilitator for Parental Singing During Skin-to-Skin Contact

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Abstract *Introduction*: When it comes to the delicate relationship between a baby and its parents, the voices of the parents have a significant role in communicating love, tenderness, and closeness as well as in supporting self-regulation as necessary for secure attachment. Under suboptimal experiences, such as premature birth, infant-directed singing takes on an even more important and therapeutic role since preterm infants miss the finely attuned auditory stimulation of the womb and the mother-infant dyad is disrupted too early.

Main aims of the chapter: In this chapter, we will draw from theory foundation, research, and clinical experience to explore the role of the parents' voices in early family-centered interventions in the NICU. Topics will include how infant-directed singing may create meaningful interaction, mutual co-regulation, emotional synchronization, and finely attuned stimulation for vulnerable preterm infants at risk of neurodevelopmental alterations. We will describe how singing for and with parents can motivate and empower parents in using their own voice for their baby. We will introduce how working with parents facilitates sensitivity to infant cues, thus enhancing the quality of parent-infant interactions and ultimately promoting paternal self-efficacy. We will discuss it in the light of the importance of early close relationship building between baby and parent, a base for further development of cognition, language, and emotions.

Conclusions: When we support parents to sing and/or use their voice in an infant-directed and responsive way, e.g., during skin-to-skin contact, we can facilitate self-regulation and nurture multimodal stimulation in a perfectly natural way for both, the baby and the parents. It contains the baby's need for closeness and safety and the parents' need of taking care and connecting emotionally.

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M. Filippa et al. (eds.), *Early Vocal Contact and Preterm Infant Brain Development*, DOI 10.1007/978-3-319-65077-7_13

Introduction

From the very first moment in life, we are depending on our senses. Through our senses we embrace our environment, and they give us all the important information that we need when we slowly assimilate to the world. Already in the womb, we are being rocked by the movements of our mother, we taste her amniotic fluid, we feel her heartbeat, and we "hear" her voice through viscous sounds in utero and bone conduction. We experience with all our senses in an already-interactive and multisensory manner which is essential for further neurobehavioral development and bonding (Als, 1983; Lopez-Teijon, Garcia-Faura, & Prats-Galino, 2015; Moon & Fifer, 2000; Moon, 2011).

Our human brain is highly dependent upon this multisensory stimulation and is built out of the relation with a loving caregiver that can stimulate and regulate the baby's feelings and emotions (Hart, 2011). The neurosensory system needs an appropriate context to get the organization of neural networks in place, and the ultimate environment for the prenatal brain to develop is, of course, the womb of the mother (Lickliter, 2000). When born preterm, the baby is exposed for incoming sensory stimulation that it is yet not prepared to handle and can lead to many stressful and painful experiences (Mörelius, 2006). They must cope with the potential sensory tensions of overstimulation and deprivation at a time when their brains conventionally grow more rapidly than during any other period in their lives (Als, 2009). They are at the risk for neurodevelopmental deficits and language delays (Aarnoudse-Moens, Weisglas-Kuperus, van Goudoever, & Oosterlaan, 2009; Serenius et al., 2013; Adams-Chapman, 2015).

Also, the environment in the NICU can be stressful for the parents (Thomas & Martin, 2000). The sudden end of pregnancy, separation from the infant, trauma of premature birth, and uncertainty of the infant's survival can evoke feelings of fear, guilt, loss, grief, and confusion (Bruns-Neumann, 2006; Jotzo & Poets, 2005). These reactions increase parental stress and can have a negative impact upon the attachment process between infants and parents. Early separation and the parents' lack of self-confidence and autonomy as primary caregivers in the unfamiliar environment of an intensive care unit may compromise bonding between the mother and infant (Bialoskurski, Cox, & Hayes, 1999; Brisch, Bechinger, Betzler, & Heinemann, 2003).

The importance of constructing a properly suited environment for ultimate development, emotional closeness, bonding, and attachment cannot be overestimated. In the light of this knowledge, one can see the importance of parents being involved in the care of their prematurely born baby as necessary both for the baby's development and for the emotional attachment and bonding between baby and parents. Who can better shape an ultimate environment of love, tenderness, and gentle sensory input that is so essential for the development of a human being than the parents.

The Lullaby: An Emotional Bridge Between Baby and Parents

For thousands of years, in every human culture, parents have been singing to their babies. It is a most natural and genuine way to create security and comfort and to share love and tenderness. In the high-tech environment of the NICU, where both baby and parents are in a vulnerable situation, the humming of a lullaby can be the bridge they need to come in tune and reconnect (Stern, 1985). A humming human voice and the melody of a well-known lullaby can facilitate an emotionally sound environment that is familiar both for the baby and the parents and may lead to reciprocal interaction (Haslbeck, 2013b; de l'Étoile, 2006; O'Gorman, 2006).

Singing lullabies has cross-cultural features: slow tempo, a simple and repetitive melody hummed without words and simple pitch contours, and it is sung in a smooth, breathy, and loving voice timbre often accompanied with gentle touch (Trehub & Trainor, 1998; Unyk, Trehub, Trainor, & Schellenberg, 1992). Lullabies that are sung in an infant-directed style are further characterized by higher pitch, loving tone, more lively variables in tempo and dynamics, and longer pauses between the phrases and repetitiveness (de l'Étoile, 2006; Trainor, Clark, Huntley, & Adams, 1997; Rock, Trainor, & Addison, 1999).

These specific features of responsive singing to infants have been shown to modify infant state and to help regulate infant arousal as to strengthen and build the bond between a baby and its parents (de l'Étoile, 2006; Trainor et al., 1997; Rock et al., 1999). Under suboptimal experiences, such as premature birth, infant-directed singing takes on an even more important and therapeutic role since preterm infants miss the finely attuned auditory stimulation of the womb and the mother-infant dyad is disrupted too early (O'Gorman, 2005; Philbin, 2000; Graven, 2000).

Kangaroo Care: A Multimodal Sensory Intervention

The history of how kangaroo mother care (KMC) became a standard care practice in many NICUs worldwide started in Colombia in 1978. Dr. Rey and Dr. Martinez at the Instituto Materno Infantil proposed KMC as an alternative way of caring for preterm-born infants. Due to a lack of incubators, they started to place all preterm infants with a birthweight lower than 2000 g on the bare chest of their mothers around the clock. The three main components in the original KMC intervention were (1) kangaroo position i.e., skin-to-skin contact in a strict upright position; (2) kangaroo nutrition, i.e., exclusive or nearly exclusive breastfeeding; and (3) kangaroo discharge policies, i.e., early discharge in kangaroo position regardless of weight or gestational age (Charpak, Ruiz-Palaez, & de Calume, 1996). During the following years, up-to-date KMC or skin-to-skin contact (SSC) has developed to become standard care in many NICUs worldwide,

and there have been outlined evidence-based guidelines to support establishment (Ruiz and Charpak, 2007).

SSC has been associated with stabilizing effects on (preterm) infants regarding respiratory rate, oxygenation, and temperature but also improved breastfeeding, bonding, and reduced paternal stress (Cho et al., 2016) Boundy, Dastjerdi, Spiegelman, et al., 2016; Moore, Anderson, Bergman, & Dowswell, 2014). In supporting the self-regulatory skills in preterm infants, SSC promotes more organized sleep-wake cyclicity and adaptation to regulating negative emotions, modulating arousal, sharing engagement, and sustaining effortful exploration (Feldman, Weller, Sirota, & Eidelman, 2002) with also long-lasting effects on executive functions and enhanced cognitive development at 10 years of age (Feldman, Rosenthal, & Eidelman, 2014). As SSC is a highly multimodal intervention with direct access to the parents' skin, heartbeat, vibrations through the bone, smell, and loving voice, one can assume that adding lullabies in this context may support even furthermore the fragile dyad of parents and preterm infants.

Music Therapy in Neonatal Care: Development Toward Multimodal Family-Centered Approaches

In the last few decades, there has been growing awareness that many of the health conditions of preterm infants, as well as the problems of parents and challenges in the parent-child relationship, may be prevented through improved therapeutic and preventative care initiated in the very beginning (EFCNI, 2011). There is a general shift from standardized treatment toward individualized relationship-based approaches including parental support, which is recognized within the discipline of music therapy as well (Haslbeck, 2012a). In the twentieth century, receptive, stimulatory types of recording were predominantly played only for infants (e.g., recordings of the mother's voice, womb sounds, and lullabies). Over the past decades, more and more (inter)active approaches with live music/singing have been implemented, also taking into account the complex triad of infant, parent(s)/families, and the NICU environment (e.g., engaging and encouraging parents to sing for their infants to support the infant-parent attachment process) (Haslbeck, 2013a, 2013b; Loewy, 2015; Shoemark, 2011; Teckenberg-Jansson, Huotilainen, Pölkki, Lipsanen, & Järvenpää, 2011; Whipple, 2000).

Even though music therapy in NICUs is a young field of practice and research, an astonishing quantity of evidence already exists. For instance, a systematic integrative review (Haslbeck, 2012a) illustrates with 43 included studies that music therapy particularly supports pacification and stabilization in preterm infants, e.g., more stable measures of heart rate and oxygen saturation and more beneficial behavioral states. This is in line with the results of the meta-analysis of Standley (2012) and the systematic review of Hartling et al. (2009). It also emphasizes that the preterm infants' perceptive faculties and capabilities are actively engaged

in music therapy to a greater extent than had been previously recognized in the literature and that benefits were greatest from live music therapy (Haslbeck, 2012; Standley, 2012).

Current studies focus more on including parental support, e.g., by combining music with skin-to-skin contact (SSC). For instance, in the study of Lai et al. (2006), the dyad of mothers and their preterm infants listened to recorded lullabies of their own choice for 60 min/day for 3 days during SSC. The study showed lower maternal anxiety and an occurrence of more quiet sleep states and less crying among the preterm infants in the treatment group. Schlez et al. (2011) evaluated active live harp music therapy versus SSC and demonstrated that active music therapy reduces maternal anxiety more than SSC alone. Similarly, Teckenberg-Jansson et al. (2011) have suggested that live harp music and humming are better than SSC alone in terms of the preterm infant's physiological parameters and parental well-being. In another study on maternal singing and SSC, it was shown that singing improved the autonomic stability in preterm infants and reduced maternal anxiety compared to silent SSC (Arnon et al., 2014). In a small pilot study, reported in a master thesis, four mothers of premature-born babies report that singing during SSC got them to feel more relaxed, helped them to be in the moment, and gave them something to do (Tuomi, 2014).

An updated world perspective on NICU music therapy shows that live music and parental integration currently dominate music therapy practice in neonatal care, with singing being the central and most important modality in all regions (Shoemark & Group, 2014). For instance, in their multicentered RCT, Loewy, Stewart, Dassler, Telsey, and Homel (2013) demonstrated that interactive live music therapy can increase cardiac and respiratory function in the preterm infant, decrease parental stress, and potentially enhance bonding. Shoemark and Arnup (2014) surveyed 60 mothers of babies in the NICU about their beliefs, thoughts, and actions regarding using their voice in the NICU. Sixty percent of these Australian mothers reported that they sang spontaneously, irrespective of maternal age, education, and parenting experience. All these results call for providing more family-centered models of live music therapy with parental singing in the NICU.

Creative Music Therapy in Neonatal Care

One of these more interactive and family-centered music therapy approaches that incorporate parental involvement is called "creative music therapy with preterm infants and their parents" (CMT). The approach was introduced initially as a single case study (Haslbeck, 2004) and evaluated in greater detail in a qualitative study (Haslbeck, 2013a, 2013b).

CMT with preterm infants and their parents is an individualized, resource- and needs-oriented music therapy approach that is based upon "creative music therapy" (Nordoff & Robbins, 1977). It has been adapted to address the specific needs of that

particularly vulnerable group of preterm infants and their parents within a NICU setting (Haslbeck, 2013b) combined with principles of CMT used on comatose patients (Aldridge, Gustorff, & Hannich, 1990). With this approach, the music therapist establishes human contact with the preterm infant through improvised, entrained infant-directed humming. CMT with preterm infants is based upon the premise that infants should be neither overwhelmed nor overstimulated. The parents, if available and willing, are involved individually in the therapeutic process, e.g., by supporting them in singing to their infant and fostering an intuitive parent-infant interaction, so as to strengthen the bonding process. CMT involves the model of psychological traumatization, incorporating specific aspects to facilitate relaxation, stabilization, and the healthy development of parent-infant relationships (Fischer & Riedesser, 2009).

In creative music therapy, we believe that everyone can respond to music, no matter how ill or disabled or even premature an infant is (Nordoff & Robbins, 1977). The Nordoff-Robbins approach implies the unique qualities of music as therapy: enhancing communication, supporting change, and enabling people to live more resourcefully and creatively (Nordoff & Robbins, 1977). If we accept that everyone is sensitive to music, which can be utilized for personal growth, health, and development, then we can accept that, through interactions with music, therapists can support and enhance the clients' expressive skills and their ability to relate to others. The noninvasive potential of creative music therapy for prelinguistic communication allows even vulnerable, severely affected individuals like preterm infants to become "active" rather than being given a solely receptive and passive role. Moreover, the focus of creative music therapy with preterm infants and their parents is on creating an individual relationship with the infant. This takes place through music, as well as by facilitating his or her relationship with parents to support the infant "coming into being," (Aldridge, 1996) the parents into parenthood, and the triad into bonding.

The preterm infant is seen as a social being (Buber, 1958; Malloch & Trevarthen, 2009a) since the newborn (including those who are premature) depends on others to construct his/her 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/herself through the reciprocal affect attunement that evolves between human beings (Papousek, 2012; Schore, 2003; Stern, 2010a). Stern's theory of *affect attunement* (Stern, 2010b), as well as the theory of *communicative musicality* by Malloch and Trevarthen (Malloch & Trevarthen, 2009b), emerged in the qualitative study of CMT (2013b) as sensitizing concept. The study results demonstrate that preterm infants are already capable of sharing subtle vitality forms in improvised live music, acting 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, 2009a; Papousek & Papousek, 1991; Trondalen & Skarderud, 2007).

As evident in the qualitative study, the finely attuned and entrained infant-directed singing of CMT offers the potential for preterm infants to engage in communicative

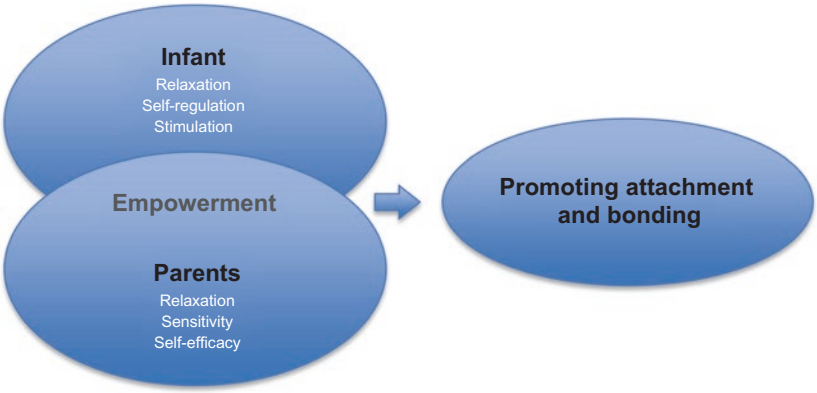


Fig. 13.1 The interactive potential of family-centered creative music therapy

musicality that can help them to get back in tune, in rhythm, in mutual co-regulation, in self-synchrony, and in interactional synchrony, even in an overwhelmingly arrhythmic intensive care environment (Haslbeck, 2013a, 2013b). The microanalysis suggests that CMT may be particularly effective at pacifying, engaging, and empowering preterm infants without being overwhelming. Furthermore, the results demonstrate that CMT may empower parents, by enhancing their well-being, self-confidence, and quality of interactions with their infant through music. By integrating parents in the therapeutic process and by supporting them in singing, they are empowered in the quality of their interactions with their infants and, thus, in their attachment process, as well as their self-confidence (Fig. 13.1) (Haslbeck, 2015b).

CMT in neonatal care is a true family-centered music therapy approach in which each family is encouraged to find their innate way of relating through singing and music (Haslbeck, 2016). With this approach, health is promoted by integrating families into the therapeutic process by providing emotional, social, and developmental support as warranted in family-centered care (Gooding et al., 2011) and highlighted in the literature of music therapy (Hanson-Abromeit, 2003; Haslbeck, 2015a; Loewy, 2015; Shoemark, 2014). This approach can also be linked to the tradition of Swedish pediatricians and nurses interested in parental singing and its impact on infant development and attachment between the baby and parents (Eulau, 2007; Lagercrantz, 2012; Lind, 1980; Ådén, 2014).

Clinical Approach

The main goals of working with preterm infants and their parents are to reduce stress and anxiety, to stabilize and empower both infants and parents, and to support parent-infant bonding. Neonatal music therapy is mostly part of a complementary psychosocial support in neonatal care.

Starting Up

Prior to initiating music therapy, an in-depth assessment of the current state and needs of the infant and its family must be conducted with the NICU team (primary nurse and/or physician/psychologist); it also must be well documented, as described in more detail in Haslbeck (2013a) and Hanson-Abromeit, Shoemark, and Loewy (2008). By identifying the needs of the infants and parents, specific short- and long-term goals can be created and adapted individually over time to the therapeutic process, in accordance with the principles of the individualized, relationship-based care model NIDCAP (Newborn Individualized Developmental Care and Assessment Program) and family-centered care approach (Craig et al., 2015; Als, 2009; American Academy of Pediatrics, 2003). Music therapy can only be offered when the infant is medically stable enough, as determined by leading members of the NICU team. Before conducting each music therapy session, again detailed information and permission must be obtained from the neonatal team. As soon as possible, we meet with parents to introduce ourselves, to personally assess their needs, to introduce the benefits of singing for their infant and themselves, and to assess their musical heritage, culture, context, and wishes. In other words, we ask a lot of questions over the whole course of the therapeutic process to guarantee individualized, resource- and need-based strategies.

The Role of the Music Therapist

In the neonatal environment, we must subordinate our therapeutic services to the priority of medical treatment and intensive care. We have to be flexible, creative, adaptive, and therapeutically responsive. By using this responsiveness, we see our role as a facilitator for meaningful interactions, which take place in the therapeutic moment with the infant and also between parents and infants by promoting the parents' sensitivity during interactions with their infants through music. Also, when music therapy only takes place between the therapist and the infant, the role of the therapist is to support the social development of the infant, not by being a surrogate for the parents but rather by functioning as an additional source of shared communicative musicality (Shoemark, 2011).

In the vulnerable situation of premature birth, a contact with a professional that is not part of the medical team may give parents a somehow broader space to share their situation and experiences on a deeper emotional level (O'Gorman, 2005; Shoemark & Dearn, 2008). Therefore, our role is also to give parents space for sharing emotions, feelings, and thoughts concerning their situation and life in general. We share our knowledge and act as a role model, when needed, in mediating the preferred way to sing to a premature-born baby and/or mediating knowledge about signs of overstimulation and signs of the baby's intentions to interact (Als, 2009). However, when working with parents, our role is not to educate them but rather to lure out endogenous capabilities of parenting and caring that are often hidden by stress, anxiety, and trauma (Boukydis, 2012). We understand our role within the

purpose of family-centered principles as coach and collaborator (American Academy of Pediatrics, 2003).

This is of great value, considering their curtailed parental role and autonomy. In this context, the task of the music therapist is to respect, integrate, and attune to the individual cultural backgrounds of families. Moreover, our role is to facilitate empowerment – empowering both the infant (e.g., by facilitating self-regulation and engagement) and the parents (e.g., by supporting their well-being, self-confidence, autonomy, and quality of interactions with their infant through music) (American Academy of Pediatrics, 2003; Haslbeck, 2013b).

Methods and Techniques

While working only with the infant, the infant is placed in the incubator or warming bed. Mostly, the music therapist starts with initial touch (touch at the infant's head and feet) that transforms into therapeutic touch to offer contact as well as to feel and stimulate the breathing rhythm of the infant (Hanley, 2008). Based on the natural multimodal stimulation in the womb, it is the most natural way not only to sing for a baby but also to hold, rock, or touch the baby. The music therapist assesses the "music" of the preterm infant – the breathing pattern, the most fundamental rhythm of a human being, together with the infant's facial expressions and gesticulations – and transforms it into infant-directed improvised humming that is constantly adjusted to the fragile rhythms and subtle expressions of the preterm infant. The singing is entrained to the breathing rhythm of the infant, e.g., by singing one long note on three breaths of the infant. The minimal movements of the infants are assessed in a musical understanding, e.g., by assessing if a movement is going up or down. Often this transformation of affects and rhythms into music takes place in a synchronous way; e.g., when the infant's eyebrows lift, the music therapist steers the melody upward (Haslbeck, 2013a). Conversely, when the infant is too aroused, the music therapist moves in the opposite way, e.g., bringing the melody downward and slowing its tempo so as to soothe the baby with sedative musical parameters (Loewy, Hallan, Friedmann, & Martinez, 2005). Moreover, the infant-directed humming or singing is kept as simple as possible, since preterm infants can easily be overwhelmed. Humming fluently using rich overtones in a lullaby and infant-directed style, keeping the music calm and soft (approx. 55 dB), simple, predictable, and repetitive, is warranted as also recommended in existing guidelines on music therapy in the NICU (Hanson-Abromeit et al., 2008). It is also the responsibility of the special trained music therapist to avoid reverberation when singing to an infant that is still placed in the incubator.

How to work with the family depends upon the circumstances (of the unit) and their wishes regarding how often music therapy sessions involving them will take place. Some parents are able to spend a lot of time in the NICU (or all the time) and enjoy the sessions that are conducted together, mostly and preferably during skin-to-skin contact.

When offering music therapy during skin-to-skin contact, the first author largely uses a monochord as accompanying instrument. A monochord is a single-stringed wooden instrument designed for the therapeutic purpose of generating relaxing sounds and vibro-acoustic stimulation. It is especially lacquered to meet the hygiene requirements of the NICU and tune in the key of the NICU environment (the key of monitors, alarms, air conditioners, etc.) to mask environmental noise (Hanson-Abromeit et al., 2008Loewy, 2000). To allow for the replication of live womb sounds (Loewy et al., 2013), the monochord is used to mimic the deep intrauterine vibratory fluid sounds. The monochord is placed next to the kangaroo care chair, so that the parents can touch the instrument with their elbow and feel the instrument's relaxing vibrations conducted through the parent's body; the vibration may then smoothly reach the infant. Since many parents are also very stressed during SSC, due to posttraumatic reactions, the relaxing sound of the monochord may be an opportunity for parents and infants to effectively calm down, relax, and perceive each other more intensely (Lee et al., 2012). Since the monochord is characterized by an open sound without chord or harmony limitations, it provides a perfect background against which to sing along calmly and vibrantly in all musical styles and keys, as preferred by the parents. For many parents, it is much easier to sing along with this accompanying instrument, because "this doesn't feel quite so naked" (a mother's quote). Also while working with the infant-parent-environment triad, CMT aims to incorporate as many of the child's and parents' rhythms, signs, and affects as possible. To honor the family's culture and choices, parents' favorite musical style and/or song(s) or the favorite song(s) of siblings, grandparents, or other family members are integrated to transform a meaningful classical or well-known melody into a "song of kin" (Loewy, 2015; Loewy et al., 2013).

Family-Centered Music Therapy in Switzerland

At University Hospital in Bern and Zurich, Switzerland, where CMT is offered, all levels of NICU are built as an open space. Visiting hours for parents are limited to the time during the day and evening. There is no general rooming-in for parents, but they are encouraged to be present, to be involved in the care of their baby, and to kangaroo in comfortable chairs next to the infant's incubator. They can close a curtain for some privacy. Music therapy takes place three times each week for the infants and the parent-infant triad until discharge, so that an intense therapeutic process can develop over time. In the sense of family-centered care (Gooding et al., 2011), once each month, a parent-to-parent support group is also being offered in collaboration with a dedicated premature mother, chaplains, and psychologists.

For the purpose of family-centered care, the University Hospital in Bern, Switzerland, was the first hospital in Europe to implement and adapt the COPE program – Creating Opportunities for Parent Empowerment – to the Swiss context. COPE is an educational-behavioral intervention program for parents. With this program, the neonatal team offers supervision and educational guidance for parents,

while supporting close contact between the parents and infant and preparing them for the transition from hospital to home. Findings indicate that the COPE program reduces parental stress (Melnyk & Feinstein, 2009). At the University Hospital in Zurich, no Cope program is provided, but the neonatal unit integrates many components of the NIDCAP approach and family-centered care approach.

Case Vignette

Annett and Peter[1] were a young married academic couple with a good social network and good relationships with family. The only thing still missing was a child. Since Annett was born with meningomyelocele and tied to her wheelchair, giving birth was associated with risks from the very beginning. When Annett became pregnant, the couple was overjoyed but also worried. In the 26th week of pregnancy, Annett felt very ill and had to be admitted to the hospital. Two weeks later, a cesarean section had to be performed because of childlike indications. Michael[2] was born at 28 weeks of gestational age, weighing 740 g. He suffered from infant respiratory distress syndrome, apnea-bradycardia syndrome, hyperglycemia, anemia, hyperbilirubinemia, a poor Apgar score, and persistent ductus arteriosus. The couple was joyful and thankful that Michael was alive but also very anxious and uncertain about the health complications being experienced by Michael. They felt helpless, shaken, and stressed. This was reinforced by the fact that Peter had to go back to work soon, which meant to be away in London for 4 days of the week. Thus, Annett and Peter had to deal with a challenging mixture of emotions and circumstances at the same time.

The NICU team referred Michael for music therapy with the aims of relaxing and stabilizing Michael, especially to help him achieve more regular, deep breathing and to support the parents to relax and to find (self-)confidence. At the very beginning, I conducted the music therapy sessions during kangaroo care with the mother. Before the first session, Annett seemed stressed and skeptical. I hummed for mother and infant accompanied with the monochord. Michael reacted positively to the music, demonstrating enhanced relaxation, more regular breathing, and increased stabilization and awareness (e.g., eyebrow lifting, smiling). Annett was very touched by the music and the positive reactions of Michael. She smiled back at her son, caressed him tenderly, and seemed to be intimately connected. Also the next sessions, she preferred just listening to some improvised music. With the aim of providing a blanket of relaxing, nurturing sound for the mother and to offer meaningful interaction with her son, this was a perfect start. Since the mother especially remained tense and stressed even during kangaroo care, it was already a huge plus that she reported feeling less anxious and stressed combining kangaroo care with singing and relaxing smooth vibrations by the monochord.

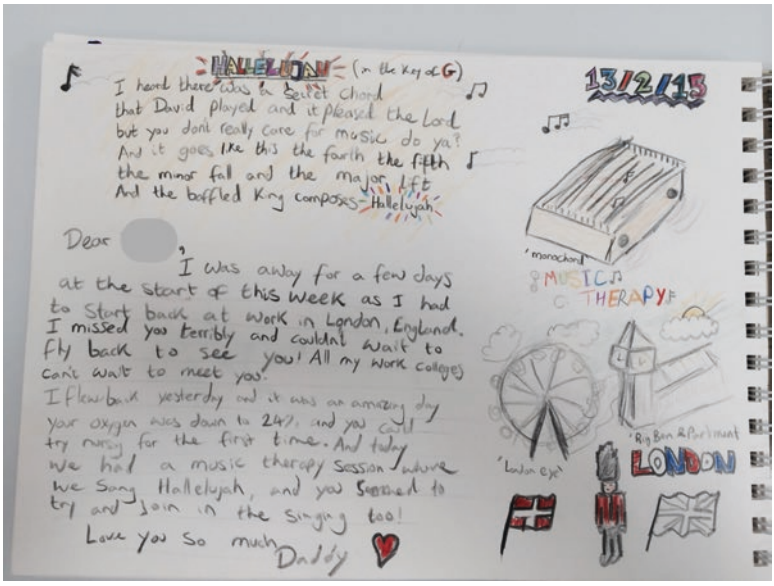
Since she told me that she would be too shy to sing but that perhaps her husband would sing for Michael, we scheduled a session with the father as soon as possible. When I asked him for a special song (song of kin) he proposed “Hallelujah” from

[1] Names changed to protect their anonymity.

[2] Name changed to protect his anonymity.

Leonard Cohen as one of his favorite songs being nurtured by which he often plays along with his bass guitar. We sang the song together while the father was in kangaroo care, entrained to the breathing rhythm of Michael and accompanied with the monochord. Michael reacted with smiling, soft finger, and mouth movements, so the father smiled back, caressed him tenderly, and seemed fulfilled with joy. He wrote in his diary: "….we sang Hallelujah, and you seemed to try and join in the singing too. Love you so much, daddy" (see illustration). Especially for the father who had to struggle with the circumstances that he was not able to visit his son every day, this was a very important and valuable "moment of meeting" for parenting and bonding.

Illustration: Diary note of Peter



From now on, the father sang regularly "Hallelujah" for Michael during kangaroo care and reported that it helped him to calm down and feel connected and that Michael continued to react positively to his singing. I also encouraged the mother to sing for Michael during kangaroo care, and she started humming softly when she felt less observed. However, when there were some health complications with Michael, the mother still worried a lot and she seemed to be stressed. There also seemed to be some tensions inherent to the couple's relationship. To support their relationship and to further help them to relax while drawing strength, I asked them if they would like to write a song, together with me, in which all their mixed feelings, individual experiences, and concerns could be given room.

The songwriting went very well. Using the melody of "Hallelujah," we drafted lyrics to incorporate the parents' individual experiences and feelings about the premature birth and their anxiety, but mainly their joy, hope, pride, love, and care were

given room. The first verse was created and sung by the father from his personal perspective and the second by the mother and her perspective. While composing the lyrics, they shared their individual experiences, feelings, and struggles to become a premature parent. After giving room for each other's feelings, they then created and sang the third verse together – much the same as a reunion of their relationship, their points of view, and their new hope and reconnection. Once the song was written, they grinned from ear to ear, filled with pride and a new sense of strength and purpose.

Hallelujah for Michael[3]
Dad*: I remember the day*
That you were born
The doctors came to inform
That you are here and
You would like to meet me
My heart was jumping out my chest
I held my hand to my breast
And every breath I drew was Hallelujah
Refrain (both):
Hallelujah, Hallelujah.
Hallelujah, Hallelujah.
Mum: *I remember the day*
That I held you
The very first time in kangaroo
Your tiny fingers touched my skin and heart
I was overwhelmed by the love I felt
It melted away the fears I held
And every breath we drew was Hallelujah
Refrain (both)
Mum and Dad:
Every day you grow strong
In our hearts you belong
We cannot wait
Until we'll take you home
Every step makes us proud
Every gaze lets our heart sings loud
Thus, it's a bold and joyful Hallelujah.
Refrain (both)

From then on, they sang that song together for Michael as much as possible. They became more and more sensitive to their son's signs and affects and the meaningful shared interactions of the music. Altogether, we had 15 music therapy sessions.

[3] Lyrics composed by his parents in the melody of the Leonard Cohen song. Listen to the original song here: https://www.youtube.com/watch?v=WIF4_Sm-rgQ

Two weeks later, they could leave the hospital with the words "We will definitively continue singing for Michael. It was as if the sun sends its golden rays. It is such a valuable resource. And we look forward to sing him to sleep in his own bed in our own home so much."

Family-Centered Music Therapy in Sweden

The neonatal intensive care units in Sweden provide family-centered care on different levels. In short, it means that the parents have the opportunity to attend their preterm-born baby 24 h/day. Parents also have the possibility to take part in the care of their baby as much as they can based on their unique situation, encouraged and supported by the staff (Craig et al., 2015; Gooding et al., 2011; Griffin, 2006; McGrath, 2001). The neonatal unit at the Karolinska University Hospital/Danderyds Hospital in Stockholm, Sweden, is one of three units in Stockholm which all three together comprise the biggest regional center for neonatal care in Scandinavia. The ward is a family-centered developmentally supportive care unit where all the medical staff are skilled in supporting and encouraging the parents as the primary caregivers with the infant's well-being, development, and possibility to attach in focus (Westrup, 2015). The neonatal unit at Danderyds Hospital was one of the first units in Sweden to implement the developmental supportive and family-centered care model NIDCAP (Westrup, Kleberg, von Eichwald, Stjernqvist, & Lagercrantz, 2000; Westrup, 2007; Örtenstrand, Westrup, Broström, et al., 2010).

At the unit, there is room for 24 infants and their parents. The ward carries two acute care rooms with four beds. In adherence to each bed is an armchair available for the parents, and the family can easily get some privacy by putting a shield in front of their corner of the room. There are also several family rooms where the parents and their baby move when the infant is stable enough. Here, the family stays until the baby is ready for discharge. In the family rooms, the parents have the whole responsibility for taking care of their baby 24 h around the clock supported and coached by the nurses. Music therapy takes place two times per week and can take place both in the acute care rooms and in the family rooms.

Case Vignette: Feelings of Closeness

I knock on the door and hear a tiny voice that says "" "Come in." When I enter the room, I see the mother sitting in the armchair with her baby girl on her naked chest. She looks at me with tired eyes and says "Oh, it's you." The room is shadowed and the air feels a bit stuffy. I ask her if I can come in for a moment, and she says yes. Beside the armchair is a stool and I settled down. When I gently ask her how it is and how her baby girl is feeling today, she answers that she is so tired that she hasn't any energy to talk about it. So we just sit together for a while, looking at the baby and following her breathing and small movements. After a while, the mother asks me if I can sing for her and her baby girl. "Can't you sing the one that we sang the last time we met?" she asks. I start to hum on the well-known lullaby with a smooth

and gentle voice, very quiet and attentive to the signs from the baby. The mother closes her eyes, and I can see that her body relaxes and that her face loses its tension. The baby seems to adjust to her mother's more relaxed posture, and the saturation of the oxygen that has been quite irregular stabilizes for a while. After some minutes, the mother opens her eyes and smiles "I love when you sing to us, it gets me so relaxed!" she says. "Do you want us to sing it together?" I ask. "Yes, please!" So, we sing together on the same lullaby and now she is looking at her baby girl with a smile and some tears in her eyes and says: "My wonderful, pretty daughter you are so strong. You are struggling all the time but Mommy is here to help you, always!" After a pause, she starts to sing on a song that she has invented and that she invents just now in the moment. The melody consists of just a few tones and is very simple. It's about how her daughter is running in their garden trying to catch a small rabbit that she wants to keep as her own, but Mommy says no, no, no, and (child's name) says yes, yes, yes. The mother invents the text while singing about how wonderful it is to be with her daughter in the garden. Afterward, we can talk about how it is and she reveals how she sometimes feels such hopelessness and that she never can rest because everything can change from moment to moment. I put her attention to the song that she just sang, how it was about their future and of what will come and mediates the importance of having dreams of the future and how it can help her in the present moment and give strength to the relation between her and her daughter. She smiles and some tears are falling. I also mediate what I observe is happening when she is singing: a smile in her face, glitter in her eyes, more energy around her and her baby, and maybe the most important – a closeness between them that is difficult to put in words but that is very strongly felt in the room. "Yes, I can feel that she likes when I sing to her!" she says. When I after a while leave them, the room seems brighter and once again I think of how absolutely invaluable it is to have the possibility to share feelings and how clearly they express themselves through our bodies, facial expressions, and voices.

Summary and Discussion

Both case vignettes illustrate how family-centered music therapy can facilitate the attachment and bonding process between the preterm infant and their parents from the very beginning through music and through parental singing (compare Fig. 13.1). Even if the infants are placed in an open space, NICU (parental) singing has the potential to facilitate a personal and safe place of intimate contact and growing relationship. Or in the words of a mother: "Singing helped me to build a bubble around us during the kangaroo sessions, a bubble that was oblivious to the surrounding world and that could shut out the disturbing going-ons. There were only the two of us. Singing helped me to build intimacy."

Within the finely attuned infant-directed singing, parents and infants are able to share a "neonatal moment of meeting" that Bruschweiler-Stern (2009) describes as essential after birth to unfold the mother-infant attachment process.

As demonstrated in a micro-video analysis (Haslbeck, 2013b), even for parents who have problems to connect with their infant, singing can lure out hidden parental capabilities of attunement and sensitivity to infant cues. This experience may result in increased numbers of appropriate parent-infant interactions and secure attachments, as argued by several authors (Fig. 13.1) (Edwards, 2011; Stern et al., 1998; Whipple, 2000).

Supporting parents in singing during SSC while holding their infant in their arms is not only the most natural way of singing lullabies, but it is also the most natural way for the infant to learn about affects and stimuli in an already-interactive and multisensory manner. When parents sing for their infant in SSC, the babies can "bathe" in this vibro-acoustic-olfactory experience that may facilitate the most natural way of relaxation, sensory perception, and attachment. However, parental stress can block these relaxing effects since stress, for instance, changes breathing patterns into small, shallow breaths and inhibits a fluently soothing vibratory voice and inner balance (Brown, 1977). And also, the infants are often very stressed and have therefore struggles to breathe calmly and deeply (Pediatrics, A. A. of, 2007). Unfortunately, stress also acts easily in a transference-countertransference dynamic and blocks relationship building (Diamond, 2015). It is therefore even more important to facilitate relaxation in both, the infants and their parents, e.g., by offering a blanket of relaxing and nurturing sound for the traumatized and stressed parents and infants during SSC and guiding the parents to breathe deeply and relax (Fig. 13.1).

Affording parents the opportunity to actively interact with their baby by singing may be an effective way of reducing feelings of guilt, fear, and lost self-esteem. Supporting parents' singing offers the opportunity for music to be a continuously stabilizing factor – a bridge from the prenatal to neonatal period and even throughout childhood. However, not all parents are comfortable to sing; they can feel exposed and worried about someone hearing them singing. The role of the music therapist is therefore to support and motivate the parents to use their voice individually, and if singing seems (not yet) appropriate, also talking in a responsive way with "motherese" is effective and powerful for both, e.g., as demonstrated by Filippa, Devouche, Arioni, Imberty, and Gratier (2013). The aim should be neither to force nor to teach the parents in singing but rather to give parents the opportunity to playfully and creatively lure out endogenous capabilities of using their voice to reconnect with their baby.

The initial conversation about family songs and musical background may also act as key to inspire parents to start singing for their infants. When the therapeutic process proceeds and the parents have been getting more confidence in singing, they often share experiences of different situations where they have been using singing or where singing has been a way to be near and to connect with their baby emotionally. Through sensitive and perceptive coaching, the music therapist can help the parents to gain a deeper understanding of their baby's emotional needs and how the singing and talking to their baby support the baby's development in different stages (Hanson-Abromeit, 2003; Malloch et al., 2012; Shoemark & Dearn, 2008; Shoemark et al., 2015). It is a reciprocal dialogue, both musical and conversational, between the parents and the music therapist where they share their knowledge,

observations, and experiences (Malloch et al., 2012; Shoemark & Dearn, 2008; Shoemark et al. 2015).

Exposure to repeated stress in preterm infants is associated with altered brain development, function, and neurodevelopmental outcomes (Radley & Morrison, 2005; Vinall & Grunau, 2014). On the other side, individualized interactive and multisensory experiences support brain development in preterm infants (Als, 2009). Also, music promotes neurobiological processes and neuronal learning and modulates synaptic plasticity in the human brain (McMahon et al., 2012; Xu et al., 2009). This begs the question if creative music therapy promotes preterm infants' brain development by facilitating relaxation, individualized interaction, and finely attuned auditory experiences at the same time. Therefore, two trials, one in Scandinavia and one in Switzerland (Haslbeck, 2015a; Haslbeck, 2014; Hugoson et al., 2015), currently examine if preterm infants who experience infant-directed singing by a music therapist and their parents during their neonatal intensive care period demonstrate improved short- and long-term neurological development. To our knowledge, these are the first randomized controlled clinical trials worldwide to systematically examine the effects of (parental) infant-directed singing on brain structure and function in preterm infants as well as their long-term neurological behavior, particularly socio-emotional and language outcomes. New insights into the potential of music on brain function and development may be gained, and a low-cost, low-risk family-centered intervention found to support brain development and well-being and secure attachment in this vulnerable group from the very beginning.

Key Messages

- Family-centered music therapy can facilitate parental singing.
- Parental singing during SSC is the most natural way for premature infants to learn about affects and stimuli in an interactive and multisensory manner that is essential for further neurobehavioral development.
- Family-centered music therapy can relax and empower both the infants and the parents.
- Family-centered creative music therapy supports bonding through experiencing communicative musicality from the very beginning.

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