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Infant-Directed Singing as a Vehicle for Regulation Rehearsal in the Medically Fragile Full-Term Infant

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Abstract

A significant step in the full-term infant's development is the achievement of self and mutual regulation. The invasive nature of care on the Neonatal Intensive Care Unit can undermine the medically fragile full-term infant's efforts to control his experiences through regulation of stimuli. During active music therapy, the therapist provides a contingent relationship in which improvised infant-directed singing serves as a vehicle for rehearsal of self and mutual regulation.

Keywords: Neonates, infant-directed singing, self-regulation, mutual regulation, music therapy.

Introduction

The Music Therapy Unit at the Royal Childrens Hospital Melbourne offers a Neonate and Infant program for families with an infant less than 12 months old. Infants admitted to this Unit have complex surgical requirements or congenital conditions which require a long hospitalisation. The music therapy service focuses on infants who were born at 32 weeks gestation onward. Most infants receiving services are aged between two weeks and 16 weeks. This is a critical time in their neurological development.

The focus of this paper is a case study which highlights how infant-directed singing supports and promotes significant development which would normally begin during these early weeks, but is inhibited by the non-contingent hospital experience.

The Hospitalised Infant

It is now accepted that the infant brain develops in response to experience. I subscribe to the theory of "optimal periods" in which the infant's brain is sensitive to developing particular systems at certain times, but with some elasticity which enables the brain to develop differently in response to radically altered experience rather than not developing those pathways at all (Werker, 2005). This drives my sense that a music therapist in a Neonatal Unit is in the right place at the right time to construct accommodating experiences through which the infant's brain may develop in a timely fashion.

To look at it simply, we understand from the research surrounding music therapy for premature infants that *music is a safe and positive sensory experience for the newborn infant*, including

sick newborns (Butt & Kisilevsky, 2000; Caine, 1991; Cassidy & Ditty, 1995; Kaminski & Hall, 1991; Standley & Moore, 1995). From the infant development literature, we know that *positive sensory experiences are necessary for healthy neurological development* (Beebe et al., 2000; Cyander & Frost, 1999; Sameroff, Bartko, Baldwin, Baldwin & Seifer, 1998; Papousek & Papousek, 1991). If we accept these two premises, then we must conclude that music is necessary for healthy neurological development. While this might overstate the matter, I am satisfied that we have a real and adequate basis for pursuing music as a vehicle for the development of infants in hospital.

We know from music therapy research that the experience of listening to recorded music assists even the most fragile premature infants (Caine, 1991; Cassidy & Standley, 1995) in regulating state but as infants mature, the next step beyond this is to empower the infant to regulate his experience of people in an interpersonal relationship by accepting and withdrawing from the stimulation they offer (Als, 1982; Jaffe, Beebe, Feldstein, Crown, & Jasnow, 2001; Nadel, Carchon, Marcelli, & Réserbat-Plantey, 1999).

For the infant who has experienced a great deal of trauma in the first days and weeks of life, any sensory stimulation may easily overwhelm him. Even if it is a positive stimulus like his mother talking to him, he may need to limit the stimulation by withdrawing for a short time. This self-regulation of the stimulation is a vital step on his part. His mother can support this by letting him withdraw and then re-engaging him when he shows he is ready (mutual-regulation).

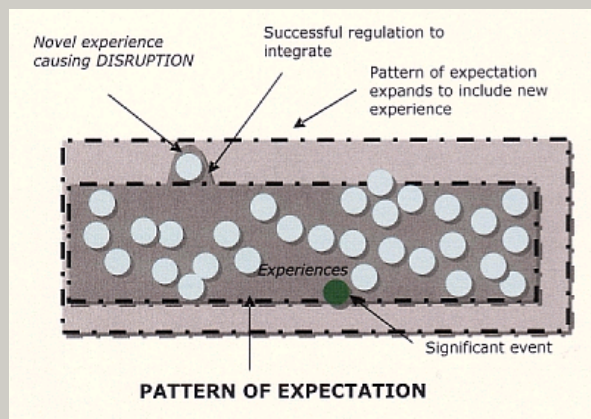
Consideration of Infant Regulation in Therapy

The success of mutual regulation is dependent upon a contingent or reciprocal relationship. The "give and take" in each partner's response to the other is how they learn to regulate what they bring and take from that relationship. Hospitalisation does not support this experience. The infant's efforts to regulate experiences are mostly ignored by the pragmatic needs of necessary procedures, positioning in the bed, and physical fragility. Because this is not the ordinary experience of a newborn, *extraordinary* experiences such as active music therapy offer a counter-balance which promotes opportunities for mutual regulation.

The consistent and predictable elements in infant-directed singing make it an ideal vehicle for a co-constructed experience to rehearse regulation. *Improvised* infant-directed singing means that the song is created in the moment in response to the infant, and thus provides an excellent vehicle for mutually regulated experiences. Consideration of each element of music - tempo, volume, timbre etc. - offers subtle and striking variation to provide the possibility for new experiences without serious disruption.

This conceptualisation of Neonatal Music Therapy works well with the model of Beebe and Lachmann (1994) who conceptualise infant experience through three principles: patterns of expectation, disruption, and significant events (Figure 1).

Figure 1. Model of infant development: Graphic representation by Shoemark incorporating principles from Beebe and Lachmann (1994).



These principles offer excellent guidance to the clinician in the moment. We grow and develop through each experience we have. Each new experience is checked against the existing range of experiences, and where similar enough, is integrated. That range of familiar experiences is known as the *pattern of expectation* (Beebe & Lachmann, 1994). Within this pattern of expectation, the infant feels safe and is able to respond with some certainty. However, new experiences will inevitably fall outside that pattern of expectation, causing *disruption*. It is in this new place that the infant may struggle with how to regulate his exposure to the experience

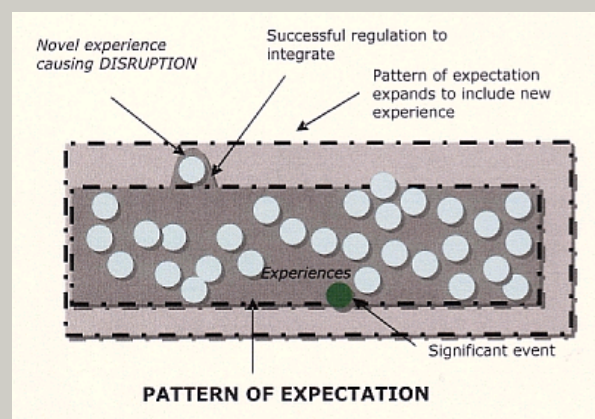
and needs assistance to incorporate it into his pattern of expectation. For the medically fragile infant, this may be a common experience. Here, the experience of improvised infant-directed singing supports the infant to learn how to use self and mutual regulation to integrate the new experiences.

Finally, the *moment of meeting* or *significant event* is what we aspire to, the transformative moment in which therapist and client share an understanding of their intention, and significant progress can occur. The experiences offered by the therapist should be ones easily consumed into the *pattern of expectation* so that the session can *progress* comfortably (Figure 2). However, because so much is new for the infant, there will be many occasions where the therapist may provide a novel stimulus causing real *disruption*. In that moment, the therapist must *repair* the experience by returning to a more familiar experience to which the infant can retreat for as long as needed (Figure 2).

The music I use is simply unaccompanied improvised singing; based on the understanding that infant-directed singing is an approachable and useful medium for all infants (Bergeson & Trehub, 2002; Rock, Trainor & Addison, 1999; Trainor, Clark, Huntley & Adams, 1997). The singing is improvised so that I can manipulate it in direct response to the infant and how I perceive him to be handling this interaction we are having. It is an authentic representation of this moment in the infant's life.

Each musical element serves a purpose. A fragile infant who shows gentle interest may be offered a melodic line with a bright timbre and tonality to engage him, and yet I might keep the phrases short with long pauses to allow the infant to form a response. An infant fully engaged in our playful song, may suddenly be struck by pain, and the bright clipped phrases will be lengthened, slowed and made legato, and the timbre will shift to a stronger, more grounded timbre to offer more stable support until the pain passes.

Figure 2. The music therapist's impact in infant experience: Graphic representation by Shoemark incorporating principles from Beebe and Lachmann (1994) and Tronick (1998).



Frank

"Frank" participated in the "Music Therapy for Vulnerable Infants" study. This multi-disciplinary study was a collaboration between MARCS Auditory Laboratories at the University of Western Sydney, the Royal Children's Hospital, Melbourne, the Murdoch Children's Research Institute, and the Mercy Hospital for Women. Significant results from the Neurobehavioral Assessment of the Preterm Infant (NAPI) before and after the music therapy intervention showed that the music therapy helps hospitalised infants cope with the Neonatal Unit environment. Infants who did not receive the therapy showed clear deterioration on the NAPI scales of irritability and crying, while infants who did receive the therapy demonstrate resilience on these measures (Malloch, Shoemark, Newnham and Prior, in preparation).

Frank was born with Oesophageal Atresia (OA). His oesophagus did not go all the way down to his stomach finishing in a little pouch. The most obvious outcome of OA is that food cannot travel from the mouth to the stomach. When he was born four weeks prematurely, he had surgery on the first day to construct a gastrostomy, a tube through which he was fed directly into his stomach. The gap between the end of his oesophagus and the top of his stomach was a long one and therefore it was nearly 12 weeks before he had the surgery to repair it and he was in hospital all that time.

While Frank waited for the operation, a fine tube, called a Replogle tube, was inserted past his vocal chords into his oesophagus to gently suction out the saliva which pooled in the bottom. It was taped to his face to ensure it was secure. He wore mittens most of time to reduce his opportunistic attempts to actually remove it. This all caused him understandable discomfort, and he was often irritable. The machine was not portable and thus Frank was confined to bed, with lifting his upper body and head up at a 45-degree angle, the only opportunity for a change.

Frank struggled to develop self-consoling behaviours such as finger sucking, self-stroking or holding. He could not make the transition from wake to sleep without assistance and slept poorly. His threshold for stimulation was very low, and novel stimuli (like someone talking to him) were not tolerated well.

I met Frank when he was nearly 8 weeks old. On my preliminary assessment visit, I wanted to discover his threshold for over-stimulation. I positioned myself in his field of vision. I looked at him, and after a moment I spoke to him in a voice that was soft and breathy, in a high register, and with descending intonation. In response, he exhibited fearful surprise with his eyes wide enough to see the whites all around, mouth open, arms presenting with jerky movement and fingers splayed. I tried to provide a simple stimulus to allow him the opportunity to get used to me as a new person. I talked in short soothing phrases, leaving silence between the phrases, offering my face in gentle invitation of raised eye-brows and mouth smiling. I continued to speak this way until he became accustomed and calmed. I concluded the session shortly thereafter, it was clear that his threshold for over-stimulation was instantly breached, and that he had little foundation upon which to place this new experience. I anticipated a program where every new experience would be considered a *disruption* and my work would be one of constant repair.

In the first session, two days after the initial assessment described above. I began the session noting that he looked uncomfortable, his body held at an angle as if he was arching his back. On reflection his cues are so very easy to read, but not so in the moment. He attempted to self-regulate by averting his gaze, simply looking away from me. Initially I did not support his effort, but continued to interact with him using short phrases of infant-directed speech. At the penultimate moment he was arched so severely away from me that he was looking behind himself. I then finally understood and I moved out of his field of vision. He responded by bringing his head forward again and adjusted his body into a more relaxed position.

This is an excellent example of *disruption* and an attempt at self-regulation and then finally mutual regulation. He found my stimulus far more than he could cope with and he regulated the experience by trying to withdraw himself. When I withdrew and respected his efforts, then he could relax. The potency in my withdrawal was that he learnt he could influence me, we could mutually regulate and this empowered us both.

By the time we reached the fifth session, 12 days later, Frank and I were more familiar with each other and were fine-tuning the range of experiences which would keep him safely within the limits of his current pattern of expectation, while exploring new experiences.

As we began the session Frank seemed annoyed. He was protesting beautifully, using voice and hands and feet in single utterance protests, with spaces between. I offered my hand to him and he used this as a stable base to centre himself, each of his hands holding one of my fingers. I emulated his vocalisation using simple descending melodic motifs to affirm him and suggested to him that he can cope. As he settled and listened to me, I transformed the spoken phrase that engaged him into a melodic motif. I had found the right level of stimulation to engage him within his pattern of expectation and offered him the new experience of singing without causing disruption.

After a few minutes, he finally did begin to cry. I decided to tilt his upper body and head up at a 45-degree angle, as the nurses had suggested that he really enjoyed this and settled well. As soon as he was raised his face and body visibly relaxed. To minimise the chance of *disruption* at this point, I returned to the melodic motif keeping my voice pianissimo, high register, breathy, with pauses at the end of the phrases. He responded with intent eye-contact, and with this

increased attunement, I added in key familiar words, such as our names and "hello." Apart from some lovely slow blinks, Frank moved his hands and his right foot in small smooth circles. I responded to these movements as pre-verbal gestures of communication. They were his shared expression with my singing. This attuned interaction was a significant event for our relationship. In this moment, with these simple movements of his hands and feet, we entered a new phase of equitable interaction and mutual regulation.

Conclusion

It is difficult to describe the truly interpersonal nature of music therapy with newborn infants but the infant development framework of self and mutual regulation is compatible with the role of therapist as instigator of progress and repair.

I hope this brief case illustration served to highlight the potential of infant-directed singing for rehearsal of a developmental task which precedes all other interpersonal interaction. The predictive stimulus of sung melody aids in the creation of expectation, while improvisation encourages new experiences without undue disruption. Within this basic but well-understood relationship significant events may occur for the medically fragile newborn infant.

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References

- Als, H. (1982). Toward a synactive theory of development: Promise for the assessment and support of infant individuality. *Infant Mental Health Journal*, 3(4), 229-243.
- Beebe, B. & Lachmann, F. (1994). Representation and internalisation in infancy: Three principles of salience. *Psychoanalytic Psychology*, 11(2). 127-165.
- Beebe, B., Jaffe, J., Lachmann, F., Feldstein, S., Crown, C. & Jasnow, M. (2000). Systems models in development and psychoanalysis: The case of vocal rhythm coordination and attachment. *Infant Mental Health Journal*. 21(1-2). 99-122.
- Bergeson, T., & Trehub, S. (2002). Absolute pitch and tempo in mothers songs to infants. *Psychological Science*, 13(1), 72-75.
- Butt, M., & Kisilevsk, B. (2000). Music modulates behaviour of premature infants following heel lance. *Canadian Journal of Nursing Research*, 31(4). 17-39.
- Caine, J (1991). The effects of music on the selected stress behaviours, weight, caloric and formula intake, and length of hospital stay of premature and low birth weight neonates in a newborn intensive care unit. *Journal of Music Therapy*. 28(4). 180-192.
- Cassidy, J. W. & Ditty, K. M. (1998). Presentation of aural stimuli to newborns and premature infants: An audiological perspective. *Journal of Music Therapy*, 35(2), 70-87.
- Cassidy & Standley, J. (1995). The effect of music listening on physiological responses of premature infants in the NICU. *Journal of Music Therapy*. 32(4). 208-227.
- Cynader, M., & Frost, B. (1999). Mechanisms of brain development: Neuronal sculpting by the physical and social environment. In D. Keating & C. Hertzman (Eds.). *Developmental health and wealth of nations: Social, biological and educational dynamics* (pp. 153-184). New York: The Guilford Press.
- Jaffe, J., Beebe, B., Feldstein, S., Crown, C., & Jasnow, M. (2001). Rhythms of dialogue in infancy: Co-ordinated timing in development. *Monographs of the Society for Research in Child Development*, 66(2). vi-131.
- Kaminski, J., & Hall, W. (1996). The effect of soothing music on neonatal behavioral states in the hospital newborn nursery. *Neonatal Network*, 15(1). 45-54.
- Malloch, S., Shoemark, H., Newnham, C., Paul C. & Prior, M. (in preparation). The Art of Intersubjectivity - Music Therapy with Hospitalised Infants. *Nordic Journal of Music Therapy*.

Nadel, J., Carchon, I., Marcelli, D. & Réserbat-Plantey, D. (1999). Expectancies for social

contingency in 2-month-olds. *Developmental Science*, 2(2). 164-173.

Papousek, M. & Papousek, H. (1991). . The meaning of melodies in motherese in tone and stress languages. *Infant Behavior and Development*, 14(4). 415-440.

Rock, A. M., Trainor, L. J. & Addison, T. L. (1999). Distinctive messages in infant-directed lullabies and play songs. *Developmental Psychology*. 35(2). 527-534.

Sameroff, A., Bartko, W., Baldwin, A., Baldwin, C. & Seifer, R. (1998). Family and social influences on the development of child competence. In M. Lewis & C. Feiring (Eds.) *Families, risk and competence* (pp. 161-185). Mahwah, NJ: Erlbaum.

Standley, J. M. & Moore, R. (1995). Therapeutic effects of music and mothers voice on premature infants. *Pediatric Nursing*, 21(6), 509-512.

Trainor, L., Clark, E., Huntley, A. & Adams, B. (1997). The acoustic basis of preferences for infant-directed singing. *Infant Behavior and Development*, 20 (3), 383-396.

Tronick, E. (1998). Dyadically expanded states of consciousness and the process of therapeutic change. *Infant Mental Health Journal*, 19(3). 290-299.

Werker, J & Tees, R. (2005). Speech perception as a window for understanding plasticity and commitment in language systems in the brain. *Developmental Psychobiology*, 46, 233-251.

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