

BUILDING A COMMUNITY WITH MOTHERS AND BABIES IN A CONTEXT OF POSTNATAL DEPRESSION: A STORY OF COOPERA- TION AND RELATEDNESS IN HUMAN KINSHIP

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Overture

You are floating and being rocked by the gentle waves of a body ocean. Initially, in an endless silence. Slowly you start to hear things. You are listening. You listen to the pumping noise of blood circulation, to the rhythm of a heartbeat, to the sounds of digestion but also to a voice. Sometimes multiple voices. But that one voice keeps on returning. This voice is the stable factor in your early and tender life and facilitates you to make the difference between day and night. Between active and passive. It provides you with the first rhythms of life. After a while you start to recognize this voice that brings you familiarity in rhythm and melody. You even start to recognize the timbre. And then, suddenly, you want to get out, searching for that same voice. Ready to give birth to your own sound. Ready to harmonize.

As a human person, we are born in a relational world. This article will bring a story of relatedness and cooperation on different levels of society and human kinship. It will describe how a cooperation between universities created artistic space to enhance the intimate social bonding between mothers and babies. Behind the narrative of the story, this article attempts to explore our human capacity to connect with the social environment from birth onwards. It will show that we appear to possess a so-called communicative musicality (Malloch & Trevarthen, 2008), a body alphabet of rhythms and tonalities to engage spontaneously with our social environment.

Artistic creation as a window into human relatedness

In 2011, 'Companhia de Música Teatral' created the musical project 'Opus Tutti' that was funded by the Fundação Calouste Gulbenkian. This project aimed to facilitate full human development and the quality of community life through

inclusion of arts in early infancy and childhood. The project developed into an international success and facilitated the building of communities between people from different cultures and ages. From a scientific perspective, Opus Tutti made it possible to examine the foundations of human relatedness by offering new tools to increase our understanding of intuitive parenting processes in early human life. In 2012, we generated an 'Opus Tutti – echo' in a cooperation between the Vrije Universiteit Brussel and Universidade Nova de Lisboa¹ to explore the potentials of artistic creation in the context of mothers with postnatal depression and their babies.

Cooperation between adults and infants: The roots of human relatedness

Numerous researchers have described the first interactions between newborn babies and their parents as a dynamic and intuitive dance (e.g., Feldman, 2007; Malloch & Trevarthen, 2008; Stern, 2004; Tronick & Reck, 2009). This dance typically features shared vitality (Stern, 1985, 2004) and joyfulness (Stern, 1990; Winnicott, 1971) and it has been shown that such moments of pleasure are fundamental to the newborns' neurobiological wiring (Ammaniti & Ferrari, 2013) along with their ability to attach to their parents (Schore, 1994). Moreover, during these daily interactions, parents provide a well-balanced structure that alternates predictability with small periods of variability (Stern, 1985, 2004) to create brief moments of surprise (Gratier, 2000; Gratier & Apter-Danon, 2008; Lamour, 1990).

During the last decade, an increasing number of studies have highlighted the musical features of these early mother-infant interactions (e.g., Gratier, 2003; Malloch & Trevarthen, 2008; Schögler, 1998; Stern, 2004). Specifically, some studies emphasized the musical quality of a mother's voice during communication (e.g., Malloch & Trevarthen, 2008; Van Puyvelde et al., 2010, 2013, 2015) along with the mutual vocal adaptations on a rhythmical (Gratier, 2003; Schögler, 1998), tonal (Van Puyvelde et al., 2010) and acoustical (Malloch, 1999-2000) level. The attempts to pinpoint spontaneous mutual vocal adaptations in the interpersonal connection between mothers and infants have revealed new concepts, such as spontaneous musicality (Malloch & Trevarthen, 2008), tonal synchrony (Van Puyvelde et al., 2010, 2013, 2015) and shared feelings of belonging (Gratier, 2008). All of these studies have in common that they emphasized the importance of proto-musicality in the creation of intersubjectivity between mothers and infants. Intersubjectivity

has become a key concept in research on human development and refers to the interpersonal processes of mutual engagement and human relatedness (e.g., Stern, 2004; Trevarthen & Aitken, 2001; Trevarthen, 2001). The intersubjective capacity has been ascribed by researchers to the neurobiological base of empathy and the mechanism of mirror neurons (e.g., Gallese, 2003; Stern, 2004; Trevarthen, 2011). Mirror neurons are a particular class of visuomotor neurons that were originally discovered in a sector of the ventral premotor cortex of monkeys, called area F5. This class of neurons becomes active when observing an action by another individual as if the observer was itself acting (e.g., Gallese, Fadiga, Fogassi, & Rizzolatti, 1996). In humans, a similar network of a 'mirror matching mechanism' (Gallese, 2001) has been established and recognized as the base of empathy (Gallese, 2003), sympathetic matching (Trevarthen, 2005) and finally intersubjectivity (Gallese, 2003; Trevarthen, 2011).

In our own research, with the discovery of tonal synchrony during vocal mother-infant interaction, we designated a new form of proto-musicality as a road to intersubjectivity (Van Puyvelde et al., 2010). During tonal synchrony, mothers and infants engage in short periods of mutual vocalizing during which they mirror and adapt their vocal utterances alternately in such a way that their pitches become tonally related (Van Puyvelde et al., 2010, 2015). Moreover, we observed how these moments of tonal relatedness could suddenly be terminated by atonal aspects, as if the mother or the baby attempt to create an alternating moment of surprise in their dialogue or a 'social negotiation' (Van Puyvelde et al., 2013). In other words, these first steps into early language, colored by spontaneous vocal games, appear to support mothers and babies in the expression of their shared lived experience during interaction. Gratier (2008) hypothesised that these kinds of interaction, that incorporate a balance between structure and variation, facilitate in mothers and babies a feeling of shared belonging.

When cooperation blocks: Music stops to play

Sometimes in life, happiness and joy are not self-evident and it may happen that a baby is born in an atmosphere that lacks vitality and 'dancing' dynamics. When music stops playing, the dancing ceases. The flow of the interactive cycles between the mother and the baby can be interrupted for several child-related and/or mother-related factors, either of which can confuse the partners about the other's non-attuned signals (Trevarthen & Aitken, 2001; Bozette, 2007; Papoušek & Papoušek, 1987; Papoušek, 2007; Trevarthen, 2011). For the mother, this confusion can cause a sense of failure to perform in accordance with the expectations of societal norms for being 'a good mother'.

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A persistent sense of failure can work as a slow poison that gradually undermines the intuitive competencies and feelings of self-efficacy in both mother and infant, ultimately affecting their intersubjective prospects (Papoušek, 2007; Trevarthen, 2011). Knudson-Martin and Silverstein (2009) described accurately how mothers with postnatal depression reported feeling imprisoned by the pressure of society to be 'a good and happy woman' and their own negative experiences in motherhood. The taboo against expressing such confusion results in feelings of depression, anxiety, paralysis and finally social isolation. As a result, both mothers with postnatal depression and their babies risk losing their voice, both literally (Papoušek, 2007; Robb, 1999) and figuratively (Knudson-Martin & Silverstein, 2009). As a result they "suffer in silence" (Knudson-Martin & Silverstein, 2009, p. 145), lock up their dissonant voices and risk severe isolation.

Cooperation between artists, mothers and babies: Searching for joy and vitality

In our project, we searched for ways to approach the isolation and give voice to this silent uncertainty in communication. We tried to develop non-invasive methods to connect with the buried instinct of spontaneous intuitive parenting, thereby formulating with the mothers an antidote to lost confidence in communication. In weekly sessions, we created a group dynamic that started to breathe vitality and joyfulness into mother-infant interactions using approaches of music and dance (Trevarthen, 2001) in a context that promotes group coherence (Knudson-Martin & Silverstein, 2009). As such, we conducted five sessions over a five week period in a 'Mother-baby Unit' of a Psychiatric Residential Setting for postnatal depression in which we aimed to clear up the misty atmosphere of the postnatal depression. The sessions were divided into 30-minute mother-infant group sessions in the morning and 90-minute mother-only group sessions in the afternoon. All sessions were recorded by four synchronized digital cameras. Using second-by-second micro analyses, we outlined the course of mother-baby intersubjectivity and the influence of group dynamics on intersubjectivity (see also Van Puyvelde et al., 2014a).

The fundamental structure was based on elements from the *BebéBabá* project of the 'Companhia de Música Teatral' (Rodrigues et al., 2010; Rodrigues et al., 2008) and the Music Learning Theory of Gordon (1990). *BebéBabá* was created in Portugal with the aim of stimulating parents to be the artists for their own infants and to promote social relatedness through music. *BebéBabá* always starts with a series of music workshops (a minimum of four sessions) and ends with a final joyful festivity on stage (Rodrigues et al., 2010; Rodrigues et al., 2008). In this project, we replaced the final performance with a

CD-recording of a song that we created with the mothers themselves to keep as a memento afterwards. Further, we incorporated principles of Gordon's (1990) methodology, making use of a diverse repertoire of songs, chants, movement activities and silences to maintain infants' interest. With regard to the context of postnatal depression, we chose songs with pentatonic and consonant characters in order to evoke moments of tonal synchrony (Van Puyvelde et al., 2010, 2015).

In the morning sessions, we attempted to create a unique ocean of musical experiences and exchanges that attracted both mothers and babies. During these sessions we made use of singing, movement and small baby games being careful to respect the organizational structure/variation of a mother-baby interaction as suggested above (Gratier, 2000, 2003; Gratier & Apter-Danon, 2008). The weekly use of an identical welcome and farewell song and the fact that the lyrics of these songs included the names of all participants, fostered companionship and established a predictable ritual or structure. The sessions were characterized by musical improvisation based on the rhythms and sounds that were spontaneously uttered by mothers and babies. Further, we refrained verbal speech to avoid cognitive appraisal and perseveration (Trevarthen, 2011) and to create openings for vitality and companionship (Rodrigues et al., 2010; Trevarthen, 2001; Trevarthen, 2011). Mothers were never encouraged in a direct verbal way. Instead, they were invited to take part and to submerge in our climate of vitality and music. Finally, we also chose two artists to guide the sessions in order to encourage potential maternal-infant dynamics by means of brief moments of voice and gesture games, mimicry and pantomime between the two artists in the effort to fulfill an implicit dyadic role model (see also Van Puyvelde et al., 2014a).

In the afternoon sessions, we worked with the mothers while the babies were sleeping or nursed by the hospital staff. The afternoon sessions were also non-verbal group experiences based on movement, dance and enacting, organized around several relational themes relevant in a context of postnatal depression. These themes included (1) taking care and being taken care of, (2) social coherence and social isolation, and (3) inner strength and emptiness (e.g., Beck, 2006; Knudson-Martin & Silverstein, 2009; Mauthner, 2002; Raphael-Leff, 2004). All these themes are interrelated with one another in a subtle way. One of the consistent destructive feelings observed by clinicians during post-natal depression is a general confusion about changing identity with regard to 'becoming a mother' (e.g., Beck, 2006; Mauthner, 2002; Raphael-Leff, 2004) which is strongly related to the earlier discussed social construct of motherhood (Knudson-Martin & Silverstein, 2009).

According to the literature, when mothers experience desperation or have the feeling of losing control on their own thoughts, they start to feel as though

their 'normal self' has been disappeared. They feel empty, flattened and report feelings that refer to the 'dying of the self' (Beck, 2006). When the 'self has died', they feel overwhelmed and isolated (Beck, 2006). A depression-related emptiness or flattened affective state, indeed, often obstructs a mother from feeling her own needs, for instance, the need to be cared for themselves. Consequently they risk losing the desire to care for the infant, which in turn risks developing into feelings of guilt and worthlessness as a mother. A carefully developed containing context may awaken forgotten memories of trust and nursing. Even if the mothers were themselves raised in an environment with limited happiness and care, the experience of a caring community may – although being confronting – finally offer a healing experience and consolation (see fig. 1).

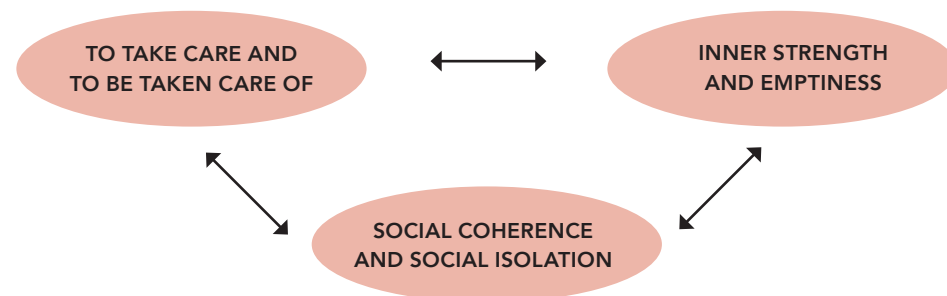


Figure 1. Three interrelating themes with regard to postnatal depression that were central during the afternoon sessions

In order to explore these central themes in a safe manner, the non-verbal approach was also applied in the afternoon-sessions (with the exception of some small instructions). Many mothers who suffer postnatal depression report experiences of feeling misunderstood by their community when trying to explain their feelings of despair and helplessness (e.g., Knudson-Martin & Silverstein, 2009; Mauthner, 2002). This taboo imposes silence upon their thoughts and forces them to escape into isolation as a logical self-protecting consequence. By substituting the verbal dialogue with a simple enactment of the needs, we could avoid this internal conflict. Moreover, we are convinced that it was easier for mothers to accept and trust consolation in the arms of a soul mate (i.e., another mother) struggling with similar feelings than to be held by the arms of an outsider who may be judgmental.

In both the morning and the afternoon sessions, the voice was a central factor. We believe that the exploration of identity can be fostered by an exploration of the mother's own voice and its personal resonance. Therefore, we explored the voices in all their facets of color, timbre, volume, pitch, rhythm,

sound-variation, etc. So besides the creation of togetherness by simply recalling the songs that we sang during morning sessions with the babies, we also made use of improvisatory sound, chant and movement expressions. It was also during the afternoon sessions that we created and recorded the aforementioned special song that was based on the nick-names of the babies. In other words, we attempted to liberate the choir of voices that were imprisoned in each of these mothers, chained to a wide range of emotions.

The program had a significant impact on the mother-baby intersubjective² interactions. Figure 2 illustrates that moments of intersubjectivity were more than doubled and the total time of shared intersubjectivity was tripled from the first towards the last session. Moreover, the mean duration of an intersubjective moment increased significantly. Overall, mothers and infants reached more moments of intersubjectivity that also were longer in duration. Figure 2 also shows that the number of intersubjective moments and the amount of intersubjective time were both similar in the first part of Session 1 and Session 5. Mothers seemed to be socially desirable in the start of the program, trying to do their best to engage with the artists. However, in Session 1, this intersubjective involvement could not be continued towards the end of the session, there was a significant decrease from Part 2 onwards. However, by Session 5, increased climates of joy and vitality could be sustained throughout the whole session (for a detailed overview, see Van Puyvelde et al., 2014a).

Since we were interested in the group processes involved in the creation of mother-infant intersubjectivity, we analyzed the group dynamics as well and considered dyadic intersubjectivity between a mother and her baby at three possible levels. Dyadic Intersubjectivity could occur as a small step being part of a larger group process as a whole (i.e., Level 1). For instance, during group singing, the infant starts to vocalize and attracts the mother's attention, who – at her turn – starts to laugh and rock the infant for a short moment. At Level 1, mothers and babies actually would not have reached intersubjectivity without the stimulation of the group dynamics. Dyadic intersubjectivity at Level 2 was a long mother-baby exchange that was still inspired by previous group dynamics. For instance, a mother starts a rhythmic interactive game with the infant based on a chant that was previously introduced by the artists. At Level 3, the dyadic intersubjectivity appeared independently from the group processes. At this level, intersubjectivity occurred between the mother and the baby without

² Based on Loots, Devisé, & Jacquet (2005), we defined intersubjectivity as "an interaction state of shared involvement in a reciprocal exchange that is observed after an initiating act by one of the interaction partners toward the other". "Shared involvement" refers to a state of shared attention during which the partners address a same topic, activity, object, or meaning. "Reciprocal exchange" refers to the mutual responsivity of the interaction partners by means of coordinated behavior patterns, shared intentions or feelings, exchanged vitality affects, joint attention, or meaning.

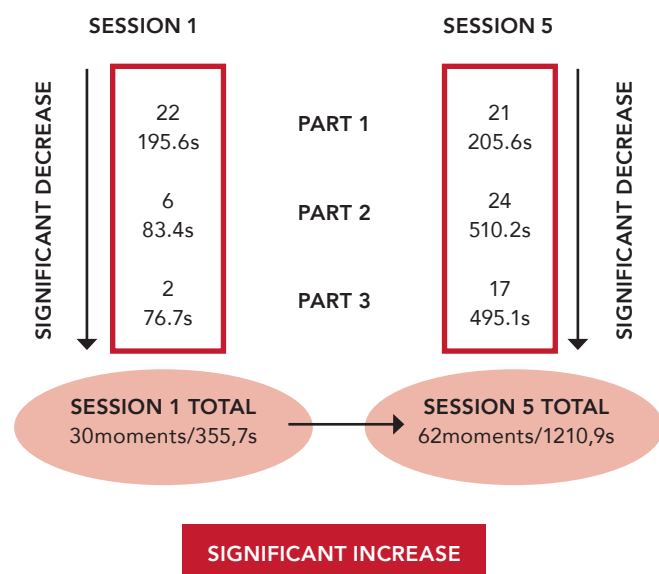


Figure 2. Overview of the course of the observed moments of intersubjectivity and their duration (in seconds) between mothers and babies with postnatal depression in Session 1 and 5 of a mother-baby music group session.

being engaged with the group, playing their own game, as if they were just the two of them. The results showed that, in the start of the program, mothers and babies needed the energy of the group to break through the social isolation, to build trust in being a good 'dancing-partner' and to reach intersubjective encounters. The flow of the group and the music appeared to provide the containment that mothers and babies needed to find this confidence to abandon their silence and to harmonize their voices (i.e., Level 1, see fig. 3). By Session 5, they showed autonomy in the creation of playful moments (i.e., Level 3, see Figure 3). It seemed that mothers and babies initially adhered to the belief that the artists were the owners of the dynamic forces of the musical ocean, that the lively dynamic exchanges that they experienced weekly during the sessions were intrinsic to music therapy. However, by Session 5, they started to learn about creating their own ocean with storms, bays, ebb and flood. They discovered vital and joyful communication as a spontaneous constituent of the interpersonal world with their own baby. Mothers and babies came to express what Dissanayake (2000) has already suggested, namely, that the dynamic of a mother-baby relationship is akin to that of a music therapy session.

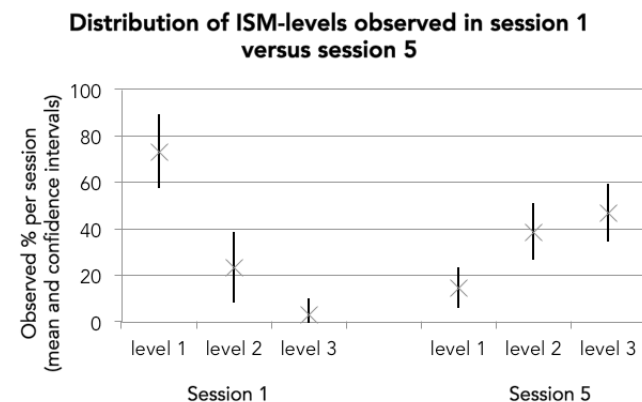


Figure 3. Illustration of the distribution of the qualitative levels of intersubjectivity that refer to the group contribution, observed in Session 1 versus Session 5 (mean observed % and confidence intervals). Confidence intervals show a significant decrease in Level 1 and a significant increase in Level 3 from Session 1 towards Session 5 pointing to increased autonomy in the creation of intersubjectivity (see text). The increase in Level 2 was not significant (© Figure illustrated with permission from Wiley, *Infant Mental Health Journal*, Van Puyvelde et al., 2014a).

We believe that the use of musical improvisation was an essential part that contributed to the success of the program. Improvisation appeared to provide a well-balanced platform to stimulate relatedness as well as self-actualization. For Ruud (1998), during musical improvisation, a piece of music is built in a very similar way as social identity in life. Both constructs comprehend circular processes that involve other people who may influence one's plans, decisions and goals. Indeed, these playful islands of exploration were used by the mothers and the babies to nurture a sense of identity, inner strength and self-confidence in the presence of the other group members. The mothers and babies were challenged in mastering their experiences in the influential presence of the others in the group and in making choices about their next step in the process. In other words, they learned to tolerate multiple voices (Gratier, 2008) in a musical and experiential way.

From this perspective, the increased observed autonomy throughout the sessions within between the mothers and the babies can be interpreted as an increased level of trust in the partner. We believe that trust is essential to re-engage in intuitive parenting and to reconnect with one-self's identity. Therefore, it is not surprising that the observed improvisation group processes were very similar to processes that have been described in earlier mother-infant observation research: "The actions of the self and the other interlock and engage, each motivated and coordinated by and through an orientation

to the other without reflective awareness of either oneself or the other. Individuals do not think about their others. They respond to them and are absorbed in a common action. Each action by the one calls forth an action from the other, which calls forth an action from the first, and so on [...]” (Loots & Devisé, 2003, p. 298 based on Crossley, 1996). This quote was used in a previous study to describe how parents and babies can be engaged in a mutual action, just being absorbed in the present and enjoying the moment without the need to reflect on it. The resemblance – again, as already suggested by Dissanayake (2000)– with musical improvisatory processes is meaningful.

Cooperation between theory and practice: the relevance of Opus Tutti

In infant research, a growing number of scholars are interested in pinpointing potential biological determinants by means of psychophysiological and cross-cultural research. The current perspectives the research domains reported here suggest the existence of spontaneous musicality in adults as well as infants that appears to become evident in an affective and relational interaction context (e.g., Disanayake, 2000; Gratier, 2000; Gratier & Apter-Danon, 2008; Malloch, 1999/2000; Malloch & Trevarthen, 2008; Papoušek, Papoušek, & Bornstein, 1985; Schögler, 1998; Van Puyvelde et al., 2010, 2013, 2014a, 2014b, 2015). In infancy, during early interaction processes, the integration of intuitive micro-processes foundationally allied to music-related aspects of rhythm, timing (Jaffe, Beebe, Feldstein, Crown, & Jasnow, 2001; Gratier, 2003) and tonality (Van Puyvelde et al., 2010, 2015) has been demonstrated to be essential in the development of social engagement (Jaffe et al., 2001; Van Puyvelde et al., 2013), the formation of companionship (Malloch & Trevarthen, 2008; Trevarthen, 2001) and the sense of shared cultural belonging (Gratier, 2003, 2008). These findings raise the question whether our roots in intersubjectivity and our human capacity to build a community may be related with a biologically driven musicality as a foundation of our human civilization.

Throughout the history of mankind, music has fulfilled a role of social bonding and cohesion (Dissanayake, 2000; Freeman, 1998; Chanda & Levitin, 2013). Moreover, in several psychophysiological studies, the importance of specific qualitative vocal features in the formation of relationships has been shown. For instance, recent research demonstrated that the melodic prosody in human (Seltzer, Ziegler, & Pollak, 2010; Seltzer, Proski, Ziegler, & Pollak, 2012) as well as animal (Campbell, Ophir, & Phelps, 2009) vocals has a positive impact on oxytocin release and a negative impact on cortisol release. Oxytocin is the most prominent neuropeptide in the mediation of social affiliation and bonding (e.g., Insel, 2010, in Chanda & Levitin, 2013) by regulating

stress and anxiety-related processes (Bartz, Zaki, Bolger, & Ochsner, 2011, in Chanda & Levitin, 2013). From our own research (Van Puyvelde et al., 2014b), we have learned that listening to music featuring the typical consonant characteristics of tonally synchronized vocal mother-baby dialogues can regulate the physiology of young babies. Moreover, tonal music appears to evoke mother-baby physiological co-regulation when the two have close body-contact and are mentally engaged in a shared experience (Van Puyvelde et al., 2014b). Besides music and prosody perception, the impact of music group experiences have been studied in the literature. In this context, it has been shown that immune function is enhanced by group-singing. The immunity response levels of secretory immunoglobulin A significantly increase and the stress hormone cortisol significantly decreases during choir singing rehearsals (Beck, Cesario, Yousefi, & Enamoto, 2000) as well as during listening to choral music (Kreutz, Bongard, Rohrmann, Hodapp, & Grebe, 2004).

Overall, it seems that the current research findings with regard to the impact of the rhythm and prosody of music on physiological processes provide the first explanations of the beneficial effects of music and art on human well-being, supporting what clinical and artistic practitioners have been noticing for a long time. Musical and artistic experiences appear to correlate with the powerful capacity to form social bonding and build communities by means of biologically driven processes of mental and bodily regulation. Therefore, initiatives like Opus Tutti and its international echoes of inspiration that are oriented towards babies and young children are extremely important in promoting the maintenance of social coherence in future generations.

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Glossary

Intersubjectivity

Intersubjectivity has become a key concept in research on human development and refers to the interpersonal processes of mutual engagement and human relatedness. The intersubjective capacity has been ascribed by researchers to the neurobiological base of empathy and the mechanism of mirror neurons. We defined intersubjectivity as “an interaction state of shared involvement in a reciprocal exchange that is observed after an initiating act by one of the interaction partners toward the other”. “Shared involvement” refers to a state of shared attention during which the partners address a same topic, activity, object, or meaning. “Reciprocal exchange” refers to the mutual responsiveness of the interaction partners by means of coordinated behavior patterns, shared intentions or feelings, exchanged vitality affects, joint attention, or meaning.

Mirror neurons

Mirror neurons are a particular class of visuomotor neurons that were originally discovered in a sector of the ventral premotor cortex of monkeys, called area F5. This class of neurons becomes active when observing an action by another individual as if the observer was itself acting. In humans, a similar network of a ‘mirror matching mechanism’ has been established and recognized as the base of empathy, sympathetic matching and finally intersubjectivity.