



Short communication

Mother- and father-infant interactions at 3 months of corrected age: The effect of severity of preterm birth



Erica Neri^{a,*}, Francesca Agostini^a, Giovanna Perricone^b, Maria Regina Morales^c, Augusto Biasini^d, Fiorella Monti^a, Concetta Polizzi^b

^a Department of Psychology, University of Bologna, Bologna, Italy

^b Department of Psychological, Educational and Training Sciences, University of Palermo, Palermo, Italy

^c C.E.S.I.P.P.U.O., A.O. Ospedali Riuniti Villa Sofia Cervello, Palermo, Italy

^d Paediatric and Neonatal Intensive Care Unit, Bufalini Hospital, Cesena, Italy

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ABSTRACT

Early interactions of 92 preterm infants with their mothers ($n = 54$) and fathers ($n = 38$) were explored at 3 months using CARE-Index. Results showed differences in interactions based on parent's gender, with higher control in mothers and unresponsiveness in fathers, while no effect of severity of birth weight emerged.

Since the 1970s, the field of Infant Research has deepened the study of early mother–infant interactions. Studies have emphasized the importance of maternal sensitivity (i.e. the ability to give an appropriate response to an infant's needs) in promoting later child development, and fostering the growing abilities in self-regulation, socialization, cognitive and emotional functioning (Ainsworth, Blehar, Waters, & Wall, 1978; Feldman, 2007). Recently researchers have shown increased interest in early father–infant interactions, highlighting that paternal sensitivity is similarly associated with an infant's growth and plays a buffering role when the mother–infant relationship is at risk (Lamb, 2010; Sarkadi et al., 2008).

Some studies have compared early mother–infant and father–infant interaction patterns, showing similar levels of synchrony and positive affect (Feldman, 2003). However some differences in arousal levels have been noted: mother–infant interactions seem to be more frequently characterized by neutral or low arousal, while interactions with fathers often appear to be exciting and animated engagements, associated with more points of high arousal (Feldman, 2003; Forbes, Cohn, Allen, & Lewinsohn, 2004; Kokkinaki & Vasdekis, 2015).

Given the relevance of the co-construction of early parent–infant interactions and their consequences for child development, it is important to recognize situations where infants may be at risk. Among these, preterm birth (i.e. childbirth before 37 weeks of pregnancy) represents a specific risk factor for infant survival and also constitutes a stressful and traumatic event for parents, often impairing the onset of interactions and the relationship with the baby (Forcada-Guex, Borghini, Pierrehumbert, Ansermet, & Muller-Nix, 2011; Monti et al., 2013; Neri, Agostini, Salvatori, Biasini, & Monti, 2015; Perricone et al., 2014).

The neurophysiological immaturity of preterm babies means that they are often more passive, and less attentive and alert compared with full-term infants in the early interactions with their mothers (Feldman & Eidelman, 2007; Goldberg & DiVitto, 1995; Forcada-Guex et al., 2011; Korja, Latva, & Lehtonen, 2012; Montiroso, Borgatti, Trojan, Zanini, & Tronick, 2010; Sansavini et al.,

* Corresponding author.

E-mail addresses: erica.neri4@unibo.it (E. Neri), augustobiasini@gmail.com (A. Biasini).

2015). Furthermore, many studies have reported how mothers of preterm infants tend to interact in a very active and overstimulating way, in comparison to mothers of full-term infants (Feldman, 2007; Forcada-Guex et al., 2011). In general, mothers' interactions with their preterm infants have been considered less synchronous than those of full-term dyads (Feldman & Eidelman, 2007). However, recent studies (Bilgin & Wolke, 2015; Korja et al., 2012) have called into question previous findings, showing that interaction patterns characterized by very active stimulation could actually be appropriate for preterm infants, balancing the weakness of infants' communicative signs.

To date there is a very small set of studies investigating father–infant interaction in the context of prematurity (Baldoni et al., 2010; Feldman & Eidelman, 2007; Field, 1981; Harrison & Magill-Evans, 1996). In comparison with fathers of full-term babies, those of preterm infants tend to interact in a less sensitive way (Baldoni et al., 2010). Early interactions of fathers and preterm infants seem characterized by less synchrony and moments of joint attention compared with full-term dyads (Feldman & Eidelman, 2007; Harrison & Magill-Evans, 1996; Kmita, Kiepusa & Majos, 2014).

In general, most studies have investigated the characteristics of early interactions in separate samples of either mothers or fathers. To our knowledge, only three studies (Feldman & Eidelman, 2007; Hall et al., 2015; Harrison & Magill-Evans, 1996) directly compared preterm mothers' and preterm fathers' interactive styles, showing maternal patterns as more appropriate than paternal behaviors. These studies hypothesized that the effect of prematurity on interactions was no longer significant when parent gender was considered. However, to date the influence of parent gender on the quality of early interactions in preterm populations remains unclear.

A further consideration regarding premature birth is the heterogeneity of risk factors that may impact differently on early parent–baby interactions. These risk factors may include the presence of complications during hospitalization (Miceli et al., 2000), low gestational age (Sansavini et al., 2015) and low birth weight (Agostini, Neri, Dellabartola, Biasini, & Monti, 2014; Morales, Polizzi, Sullioti, Mascolino, & Perricone, 2013). Babies weighing less than 1500 grams (extremely low birth weight; ELBW) are considered at high risk and may report a delay in global development (Biasini et al., 2012) that could significantly affect infant ability to interact. For this reason, preterm dyads with VLBW and ELBW infants may show more difficulties interacting compared with full-term dyads (Neri et al., 2015).

The main aim of this study was to deepen understanding of the role of parental gender on the quality of early parent–infant interactions with preterm babies. Mother- and father–infant interactions were compared in such families. Based on previous studies, we expected to find more difficulties in father–infant interactions compared with mother–infant interactions (Hall et al., 2015; Harrison & Magill-Evans, 1996). Second, the study aimed at evaluating the role of severity of prematurity (based on birth weight) on the quality of interactions, hypothesizing that ELBW parents would display less sensitive behaviors during their interactions than for VLBW ones. Finally, we explored the combined effect of the two factors (parental gender and severity of prematurity) on the quality of interactions. Given the limited literature in this area, this effect was investigated from an exploratory perspective.

The present study was part of a follow-up project which assessed preterm infant development from 3 to 18 months of corrected age and the quality of the relationship with mothers and fathers, aside from parenting stress and symptoms of depression/anxiety (PRIN 2013/2016).

The sample was recruited from the Neonatal Intensive Care Unit (NICU) of two Italian hospitals (Bologna and Palermo), in collaboration with the Alma Mater Studiorum University of Bologna and the University of Palermo. The research was approved by the corporate ethics committee (Palermo 2 at A.O. Ospedali Riuniti “Villa Sofia-Cervello”, prot. AOR/164–05/06/2014), as well as by the ethics committee of the Department of Psychology, University of Bologna (prot. 160–18/02/2012).

All parents of the severely preterm babies (gestational age < 32 weeks and birth weight < 1500 g) were considered eligible for the study in accordance with the following exclusion criteria: the presence of pre-existing psychiatric disorders, the lack of fluency in Italian language, the presence of infant neurological diseases or complications and a genetic disease or syndrome. In total, 92 parents (54 mothers and 38 fathers) were included in the study.

Parents were subdivided into the following two groups according to the level of prematurity of their infant (defined on the basis of birth weight): 69 newborns with a gestational age ranging between 32 and 28 weeks and a weight between 1500 and 1000 g were included in the VLBW group, while 23 babies with a gestational age less than 28 weeks and a birth weight lower than 1000 g were included in the ELBW group.

Recruitment of mothers and fathers was mediated by the medical staff of the NICUs involved. At 3 months of infant corrected age, all families were invited to a university laboratory for the assessment, where parents completed a written informed consent form as required by the Italian law (Art. 13 of Law no. 196/2003) and an *ad hoc* questionnaire regarding socio-demographic variables (age, education, employment status, marital status, parity). Infant clinical data (birth weight, gender, gestational age, type of delivery) were collected from the hospital medical records.

During the assessment, we video recorded five minutes of free parent–infant interaction for later evaluation using the Child-Adult Relationship Experimental Index (CARE-Index; Crittenden, 2007), a video-based assessment of the quality of parent–infant interaction, already widely applied in preterm populations (Bilgin & Wolke, 2015; Forcada-Guex et al., 2011; Korja et al., 2012). According to the CARE-Index procedure, parents were asked to play freely with their infants using a standard set of toys. Parental interaction patterns were evaluated by three scales: Sensitive (a behavioral pattern which can positively involve the infant in the interaction, raising his/her well-being and attention, and reducing discomfort); Controlling (characterized by actions experienced by the baby as intrusive, typical of a hostile caregiver); and Unresponsive (characterized by physical, facial and vocal withdrawal). Infant interaction patterns were assessed by four scales: Cooperative (the infant's interactive behavior is characterized by pleasure and involvement); Compulsive-Compliant (characterized by withdrawal and mistrust); Difficult (the infant manifests resistant behaviors and opposition); and Passive (the infant tends to reduce contact and interaction with the caregiver). Each scale ranged from 0

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