

From pregnancy to the 9th month: the development of early interactive-relational competencies of the child in the family context *

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Summary. *The study is focused on the “father-mother-infant” primary triangle, which starts developing during pregnancy with the co-parental interaction, and has a specific role on the early infant’s interactive development. Several studies have demonstrated links between the co-parental interactions in pregnancy and the quality of the early adult-child interactions (McHale, 2007). The research aimed to investigate: a) the characteristics of co-parenting in pregnancy with the prenatal Lausanne Trilogue Play (LTP, Corboz-Warnery and Fivaz-Depeursinge, 2001); b) the patterns of stability and change of early triadic interactions from 4^o to 9^o month of the infant with the postnatal Lausanne Trilogue Play (LTP; Fivaz-Depeursinge and Corboz-Warnery, 1999); c) the role and/or the influence of co-parental interaction on the development of mother-father-child interactions in the first year of child. 70 non-referred primiparous families were recruited at child-birth courses. Observational data were collected at time 1 (7th month of pregnancy) by the prenatal LTP, and at postnatal times 2 and 3 (when infants were four and nine months of age) by the postnatal LTP. Collected data show good reliability of the LTP coding and a consistent factorial structure. The analyses highlight an improvement of the family interactions over the first year: the quality of triadic family interactions increases from pregnancy to parenthood. The adult interactive capacities in pregnancy represent an interactive matrix for the construction of family relations during the child’s first year and may be considered as a central factor in the infant’s development of early triadic interactive abilities.*

Key words: *pregnancy, primiparous families, triadic family interactions.*

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Within adult-child/infant interactive exchanges, the intersubjectivity is defined as the capacity of the child to experience a sense of “sharing the experiences” (Rochat and Striano, 1999) through the establishment of interactive rhythms with the adult; these rhythms are organized on the basis of reciprocal behaviours, such as directing one’s gaze, or sharing vocalizations, reciprocal movements and mirroring. Many researches have studied the occurrence and the developmental trajectories of early intersubjective competences as a form of primary intersubjectivity which appears during the second - third month of life (Trevarthen, 1984; Trevarthen and Hubley, 1978). Subsequent to primary intersubjectivity, the child develops a form of secondary intersubjectivity (around the ninth month of life), that refers to the interactions in which the partners intentionally exchange messages related to a common aim, but in some way external to the relationship itself (Bretherton, 1992). Studies on the development of intersubjectivity are principally focused on the adult-child dyad and, more specifically, on the mother-child dyad.

Recently, however, the researches on the development of intersubjectivity has benefited from a very important contribution, that is, the identification of triangular competences, which refer to the capacity to interact with more than one person at the same time (person-person-person or PPP interactions) and of triadic competences, which refer to the possibility of being engaged in a dyadic interaction while remaining connected with a third part (for example, an object; person-person-object or PPO interactions). However, the emergence of this ability has only rarely been subjected to research. Consequently, most of the research within this approach is focused on the ability of the child to interact with more than one partner, with specific reference to the emergence of referential communication and secondary intersubjectivity in a triadic situation. However, the concept of triads, as studied, has always been referred to as a concept in which the dyad, as a primary unit, is placed in front of a third part, which either one or both partners can make direct contact with (for example, an external object or third part; PPO). On the other hand, ample evidence points to the fact that triangular competences are present at an earlier stage than the age of nine months. It should be noted that not only the interaction between the dyad and an object is involved, but also the interaction with two other people (Striano and Stahl, 2007; Tremblay and Rovira, 2007).

Basically, this evidence generates two questions which require further studies and empirical verifications: (a) at what age does a child start showing triangular and triadic competences? Are these already present at the stage of primary intersubjectivity or do they develop from it? (b) are the

triangular competences which the child exhibits in the interaction with two people (for example, mother-father-child) based on a dyadic programme within which the child communicates separately and in succession with each of the two partners, or are they based on a triangular and/or collective programme by means of which the child is able to communicate with more than one partner at the same time? Furthermore, a form of triangular intersubjectivity could have its developmental basis in the fact that children are frequently exposed to interaction with more than one interlocutor within a multi-person, interactive environment and this seems to be confirmed both in Western culture, and in other, different cultures (Tronick, Morelli and Ivey, 1992).

The works of Tremblay-Leveau and Nadel (1995) and Nadel and Tremblay-Leveau (1999) seem to prove the presence of primary, triangular, intersubjective ability by the age of two – three months: this specific ability does not seem to be a consequence of the dyadic intersubjectivity ability, already present at that time. In fact, these studies show that at three – four months, an infant is able to direct his gaze towards two people simultaneously: by doing this, the child signals his intention to establish contact with both people and to join a three-way system of communication. Attentive behaviours directed towards both parents are read as an index of triangular competence (PPP interaction) which is shown at a very early developmental stage (Corboz-Warnery, Fivaz-Depeursinge, Gertsch-Bettens and Favez, 1993), and as potential precursors of the same capacity, usually shown between six and ten months of age, in connection with the emergence of secondary intersubjectivity (Selby and Bradely, 2003). Support for this idea comes from the research of Tremblay and Rovira (2007) which is based on the paradigm of exclusion¹, used with children from three to six months. Children are placed in two interactive conditions, a triangular (PPP) and a triadic (PPO) one, where they can give proof of their ability in following the gaze of adults towards an object and to alternate their own gaze between both adults. Furthermore, children can

¹ The Paradigm of Exclusion refers to the work of Tremblay-Laveau and Nadel (1995) who tried to study a child's behaviour when he was momentarily excluded from interaction, as well as the ability of the child to monitor and influence the attention and the intentions of an interlocutor who was temporarily engaged with a third individual (present). In a triadic situation, each interlocutor can try to experiment with the temporary exclusion from direct communication occurring between the other two partners. Using this method, it is expected that the two interlocutors, interacting in turn with the child, establish with him a good level of positive involvement: once this moment is reached, the two adults should stop interacting with the child and speak between themselves without looking at the child, until the child himself tries to recall their attention.

send signals of communication (such as smiles, vocalizations and looks) to the adults to maintain and activate the interaction. These results seem to show an early ability of the child to participate in interactive exchanges including the presence of an adult and an object, or even two adults at the same time. However, the interesting fact emerging from this study is that children send more signals of interactive readiness (looks, smiles, vocalizations and arm movements) when interacting with two adults (PPP) than when interacting with an adult and an object (PPO): the authors interpret this result as being an early expression of willingness to be part of a three-way interaction and to share attention between two adults interacting at the same time. Taken together, these data – mainly of evolutionary nature – support the idea of early triangular competences as being an integral part of basic social motivation which is not built later on, throughout development, starting from dyadic interaction or from the triadic coordination child-object-person (McHale and Fivaz-Depeursinge, 1999).

In this same area, the Lausanne Trilogue paradigm (Fivaz-Depeursinge and Corboz-Warnery, 1999) defines the research on early interactive and intersubjective development from a theoretical and methodological point of view by proposing an approach which describes mother-father-child interactions as a nucleus of differentiated competences and with evolutionary pathways which are not necessarily dependent on dyadic pathways. Rather, they are based on the triadic unit which the natural development of the child is founded upon: the triangular system of mother-father-child (PPP interaction) is described as a co-evolutionary system (McHale, Fivaz-Depeursinge, Dickstein, Robertson and Daley, 2008). Therefore, the quality of the interaction and the triangular interactive competences of the child will evolve in parallel to dyadic competences and not as a later, subsequent, evolutionary acquisition (Fivaz-Depeursinge, Lavanchy-Scaiola and Favez, 2010).

This perspective introduces an interesting theoretical modification to the research but also necessitates a suitable methodology: the observational procedure of the Lausanne Trilogue Play (LTP, Fivaz-Depeursinge and Corboz-Warnery, 1999) is an attempt to introduce a specifically designed method to observe and evaluate the quality of the baby's early interactive competences in the context of the mother-father-child triad he/she is part of. The LTP procedure is a measure of the degree of coordination of the family as a group, as well as of the level of intersubjective competence and triangular interactivity of the child in the different phases of observation (Carneiro, Corboz-Warnery and Fivaz-Depeursinge, 2006). The use of the Lausanne Trilogue Play is giving its first results with respect to the

development of early triangular competences. Several works by the authors (McHale and Fivaz-Depeursinge, 1999; Fivaz-Depeursinge, Frascarolo and Lob-Izraelski, 2000; Frascarolo, Favez, Carneiro and Fivaz-Depeursinge, 2004) show how, at already three months, babies manifest indicators of coordination of the attention and affection for both parents, in line with the studies of the evolutionary matrix which have already signalled the emergence of this competence in this time frame. The ways in which the child precociously orientates his gaze and other communication signals towards the parents who interact with him seem to suggest the presence of triangular affective-relational competences which could be considered precursors to the intersubjective competences which emerge later by means of referential communication (Donzè, 1998; Fivaz-Depeursinge, 2002; Fivaz-Depeursinge, Favez, Lavanchy, De Noni and Frascarolo, 2005).

Some of the research based on this paradigm is starting to give results which confirm the hypothesis that the quality of interactive family patterns seems to be a stable characteristic from pregnancy onwards, during the first year of a child's life and until he reaches eighteen months of age (Weber, 2002; Favez, Frascarolo, Carneiro, Montfort, Corboz-Warnery and Fivaz-Depeursinge, 2006a; Favez, Frascarolo and Fivaz-Depeursinge, 2006b). Furthermore, a link is shown between the quality of family interaction assessed during pregnancy and the child developmental outcomes during the first year of life (Favez et al., 2006a), particularly with respect to the emergence of psycho-functional symptoms, such as sleep and behaviour disorders. These data emphasize the role of the parental component and of the quality of family interactions in influencing the developmental path of the child, starting from pregnancy and during the first year of life (Fivaz-Depeursinge, Frascarolo and Corboz-Warnery, 1996; Fivaz-Depeursinge, Lopez, Python and Favez, 2009).

On the basis of the described theoretical assumptions and methodologies, the present work aims to investigate the development of the quality of triangular interactions within a time span ranging from pregnancy until the child reaches the ninth month of age, thus contributing to the existing research applying the Lausanne Trilogue Play (LTP) method. Whilst, if many international researches, in which the observational technique is used and applied to longitudinal studies similar to those proposed by the authors, are available (Favez et al., 2006a; Favez et al., 2006b), no research has been done in our country which can be compared to the results of this work. The only one refers to the quality of co-parental interactions in pregnancy, but it does not consider the longitudinal data after the delivery (Simonelli, Bighin and De Palo, 2012).

This contribution is, therefore, offered as a replication of the original studies on the development of triangular competences in the first year of life. Specific objectives of this work are:

1) to study the quality of the mother-father-child triadic interactions throughout the first nine months of a child's life. Specific questions were: Is the overall quality of triadic interactions stable from pregnancy till the infant's ninth month of life? Does it increase or decrease in this period? Are family interactions a continuous/stable or developmental/changing phenomenon? Previous studies have found that a child's early interactions in a triadic context are stable from pregnancy till the child reaches 18-months of age: the authors consider this result to be an initial proof of the existence of early interactive triangular competences starting from the third month, which occur following a developmental path which is independent of dyadic interaction abilities and which develops in parallel (Fivaz-Depeursinge et al., 2005; Frascarolo, et al., 2004). With reference to these studies, it is hypothesized that a similar pathway characterized by stability during the nine months will be found in the studied group, to support and confirm our theoretical hypotheses and the empirical evidence;

2) to investigate if and how the interactive skills observed in parents-to-be can be associated with and/or be predictive of the triangular interactive features of the mother-father-child triadic system at child's birth and during his/her first year of life. Previous studies (Carneiro et al., 2006; Favez et al., 2006b; Frascarolo et. al., 2004) found that the quality of the co-parental interaction in pregnancy, albeit under conditions of role play, is predictive of the interactive modalities that will be used with the child and appears to be strongly linked to the developmental pathways and interactive triangular competences which the child shows in turn. The hypothesis is, therefore, to find a match with or new aspects of predictability between the qualities of the interactions observed during pregnancy and those after birth.

Method

Participants

The sample consists of 70 primiparous families who volunteered to participate in a large research project on family interactions and child development. They have been recruited at child-birth courses held by the Obstetric Gynaecological Clinic of a public Italian hospital, they all have Italian nationality and have been born in Italy. They have been informed that they would need to fill out various questionnaires and that they would be asked to come to the laboratory to be filmed in various family-interaction situations, both prenatally and postpartum. For this specific

study, families have been seen in the seventh month of pregnancy and when their child was four and nine months of age: data obtained through questionnaires and interviews administered to the parents have not been considered. This research includes a range of time from pregnancy to the 48th month of child's life and it has involved a total amount of 90 families; of these, the 70 considered for this contribution represent an homogeneous group, whose data have been taken into account and correctly gathered during the different phases. 20 families have not been included in this study, because: (a) they have dropped out the research in one of the various moments when the have been collected, or (b) they missed some data in some of the phase considered.

In the seventh month of pregnancy, the prenatal LTP observation procedure (Fivaz-Depeursinge and Corboz-Warnery, 2001) has been administered, whereas at the fourth and ninth post-natal month, parents and children have been observed through the postnatal LTP procedure (Fivaz-Depeursinge and Corboz-Warnery, 1999). In the present study the LTP prenatal procedure has been administered at the 7th month of pregnancy, in so far it corresponds to the future parents' participation to the pre-birth classes organized by health facilities; in the original researches, conducted in Losanna (CH), the prenatal LTP is administered from the 5th month of gestation, because this is the one when parents participate in pre-birth classes and they may be involved and thoroughly informed about the study. However, this difference has been discussed with the authors of the procedure, who have not underlined any substantial methodological issues in this term. The LTP procedure has been administered at the 4th month of a life in a way through which the triangular interactive patterns emerged during the previous months would have had a certain stability, thus to be observed systematically; similarly, the second administration at the 9th month coincides with the emergence of the child's secondary intersubjective competences, as it has been exposed in the theoretical part.

Pregnancies and deliveries have been medically uncomplicated, and all infants are in good health. Parents do not result to have any diagnosed psychiatric disorder. All participants have been asked to fill in a socio-demographic questionnaire which has been specifically developed for this very research so as to investigate their demographic characteristics (age, education, health condition, etc.) as well as their social characteristics (type of job, dwellings, etc.). Father's age range from 28 to 42 years ($M = 35.2$, $SD = 4.15$), and mother's age range from 26 to 41 years ($M = 33.2$, $SD = 3.78$). The average family socio-economic level is medium high. Whilst the fathers are mainly freelance professionals (38.6%; e.g. lawyers, medical practitioners, architects,), the mothers are mainly employers

(48.6%; secretaries, government employees, teachers, etc.). The length of the accomplished educational path is $M = 14.38$ years for the fathers ($SD = 3.51$, range 8-18 years) and $M = 15.26$ ($SD = 2.84$, range 8-18 years) for the mothers. 52.9% of the women have a university degree, 44.1% have a secondary school leaving certificate and 1.5% have completed the first three years of secondary school. 45.7% of the men have a university degree, 40% of them have a secondary school leaving certificate and 14.3% of them have completed the first three years of secondary school. The mean length (number of years) of couple relationship is 9 years, including both engagement and marriage years ($SD = 4.80$, range 1-17 years). Children born from these couples counted as 40 male (58%) and 30 female (43%) infants.

Procedures

In order to assess the development of triangular interactive competences in the above specified period of time, we have used the Lausanne Trilogue Play procedure (LTP, Fivaz-Depeursinge and Corboz-Warnery, 1999) in its prenatal and postnatal versions. We will describe the procedures starting from the postnatal LTP, since it represents the methodological basis on which the prenatal procedure has been built upon.

- The Lausanne Trilogue Play (LTP) is a play situation which involves father, mother and baby together (Figure 1). Parents sit in front and at each side of their child, who sits in a chair specially designed to be adapted to the child's size and weight and to be oriented towards each parent, or between them. Thus, parents' and child's bodies positions form a triangle. Whoever begins the game is decided by the research team, in order to counterbalance a possible order effect. The play is structured in four parts, related to the four possible relational configurations in a triad: (1) 2 + 1, one parent is active with the child, (2) 2 + 1, the other parent is active, (3) 3, parents and child all play together, (4) 2 + 1, parents talk to each other, while the child takes on the third party position. In the study by Favez, Lavanchy-Scaiola, Tissot, Darwiche and Frascarolo (2010), the mean duration of the LTP is 10 min and 30 seconds.

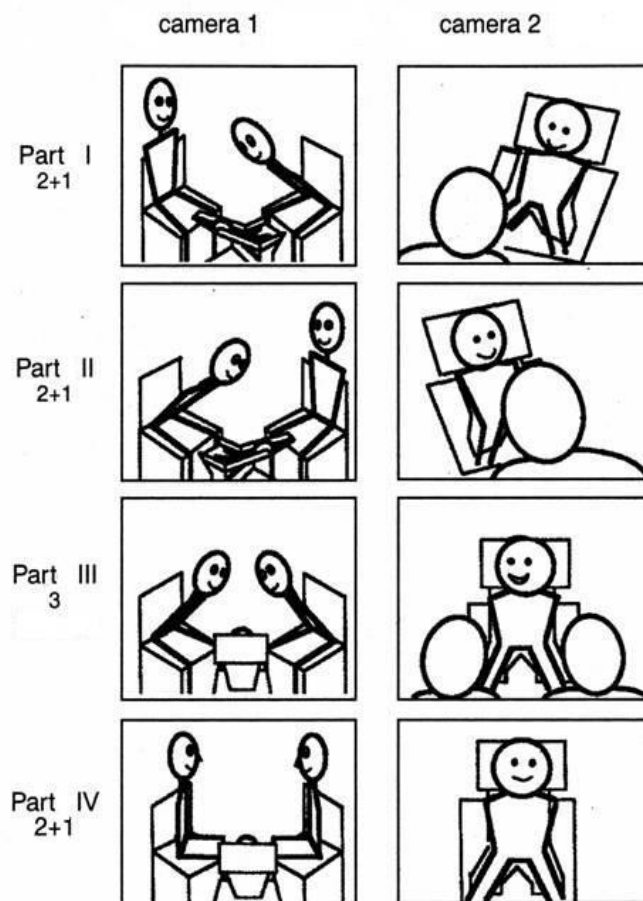


Figure 1. The four steps of the Lausanne Trilogue Play procedure (Fivaz-Depeursinge & Corboz-Warnery, 1999)

The experimenter invites the parental couple not to exceed a total time of approx. 15 minutes. The technical equipment includes two cameras: one records the parents, while the other is set to record the baby. The final images are joined into one single video so that two different images can be observed at the same time (the baby's image is in the foreground, his parents' image in the background) which makes it possible to apply the coding scheme, as suggested by the authors. This scheme is made up of ten assessment scales, rated on a 1-5 Likert scale (FAAS 4.0; Lavanchy,

Cuennet and Favez, 2006) defining ten variables, which are used to observe family interactive behaviors. The assessment scales of the LTP procedure in its prenatal and postnatal versions are, in fact, observational variables rated on a Likert scale: however, we keep calling them *Scales*, although this could be judged as a partial improper use, in order to comply with the definition offered by the authors (Favez et al., 2010). The scales of FAAS 4.0; Lavanchy, Cuennet, and Favez, 2006 are: 1. Postures: this scale derives from the basic level of interactions and it describes the ensemble of “readiness to interact” signals converging to indicate engagement in the interaction; 2. Gaze orientation: mutual gaze orientation during family’s interaction; 3. Inclusion of the partners: it’s referred to the reciprocal interpersonal engagement within the group as a whole; 4. Support and cooperation between parents (co-parenting): family unity principally depends on co-parental unity. One of the dimensions for evaluating co-parental cohesion is the support parents give/offer one another; 5. Implication of each partner in his/her role: this scale describes the position by which individuals modulate their involvement without breaking out of the interaction; 6. Parental scaffolding: to ensure the focalization function, the parents, who are hierarchically above the child, must supervise the child and provide appropriate stimulation to keep him/her engaged; 7. Infant’s involvement: this scale evaluates the extent to which the child’s signals are clear and interpretable by the parents; 8. Co-construction: inter-attentiveness is the characteristic that makes the fact of sharing a common object of attention through the orientation of the gaze or a common subject of discussion; 9. Sensitivity: this scale concerns empathic emotional reactions, or sensitivity, which is an essential component of the child’s affective development; 10. Family warmth: this scale concerns one of the emotional characteristics which is most favorable to interaction and that is associated with optimal child development (McHale and Rasmussen 1998). Each scale is assessed in each of the four procedure parts: the scores of each part (range: 10-50) are summed up as to obtain a global score (range 40-200, Favez, et al. 2010). All LTP videos have been coded by two independent judges who had been trained to this purpose: they obtained an agreement index $K=.80$ for the coding referring to the fourth month and $K=.87$ for the coding referring to the ninth month².

² The independent judges (Dott.ssa Bighin, Dott.ssa De Palo and Dott.ssa Simonelli) who coded the prenatal and postnatal version of the LTP procedure were trained to use these methods under supervision of Prof. Fivaz-Depeursinge, Prof. Frascarolo and Prof. Favez at the Centre d’Etude de la Famille in Lausanne.

-The prenatal LTP procedure (LTP, Corboz-Warnery and Fivaz-Depeursinge, 2001) is a semi-standardized, role play situation which has been developed on the methodological scheme of the postnatal LTP (Fivaz-Depeursinge, Corboz-Warnery, Carneiro and Wasem, 1998) involving mother, father and a doll, following the four parts of the postnatal LTP. The baby is represented by a "neutral" doll, with the typical size and shape of a newborn, while the face has features and traits of a Caucasian baby, "neutral" in relation to sex or particular eye, skin and hair colour. Such a "neutrality" should help parents-to-be to role-play the situation. The facilitator asks the parents to imagine the moment when the three of them will meet for the first time after delivery. She explains that the task has got four parts similar to the post-natal LTP ones. The exercise takes about 5 min. The prenatal co-parenting interaction is assessed using five scales ranging from 1 to 5 on a Likert Scale. The first three scales for the coding of the pre-natal LTP have been specifically developed by Carneiro et al. (2006) and are: 1. Co-Parent Playfulness that assesses a couple's capacity to create a playful space and to co-construct a game; 2. Structure of the Play that assesses the couple's capacity to structure the four play segments according to the instructions. Two dimensions are considered: the differentiation of the play into four discrete segments and the duration of the entire play sequence, as well as of the four segments; 3. Intuitive Parenting Behaviors that assesses the parent's use of intuitive parenting behaviors. Six behaviors known from the literature (Papousek and Papousek, 1987) are coded: holding and "en face" orientation, dialogue distance, baby-talk and/or smiles at the baby, caresses and/or rocking, exploration of the baby's body, and preoccupation for the baby's well-being. These intuitive parenting behaviors are assessed as present or absent for each parent separately. The coding system offers a score for each parent, then these scores are summed up to obtain a global score for the couple. Scales 4 and 5 are based on the Co-Parenting and Family Scale (CFRS; McHale, Kuersten-Hogan and Lauretti, 2001) and are: 4. Couple's Cooperation that assesses - at a behavioral level - the degree of active cooperation between the parents during the play; the absence of antagonism or interference is not enough to attain a high score. 5. Family Warmth that captures the affection and humor shared by the partners during play; namely, whether they manifest affection and tenderness as a couple and towards the "baby." The scores of the five scales are added up to obtain a global score varying between 5 and 25. Two independent observers code all sessions to assess inter-rater reliability using Cohen's Kappa index, $K = .87$. The Inter Class Correlation index (ICC) is $ICC = .85$ (Simonelli, Bighin and De Palo, 2012; Simonelli, Bighin and De Palo, 2011).

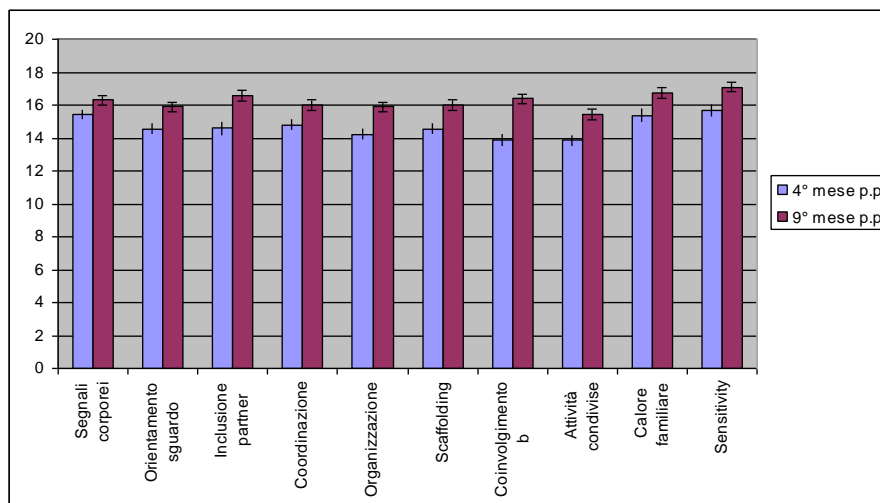
Results

The development of triadic family interactions from the 4th to the 9th month of the child

The first aim of the research is to study the quality of mother-father-child interactions and its trend during the first 9 months of the child. To this purpose, Pearson's correlation analysis has been applied to the total scores of the LTP at the two stages of administration: the analysis of the dimensions has not found significant correlation between the LTP score at 4th and 9th month of the child. As a consequence, the T (paired sample) test has been applied, in order to test any possible difference between the total scores obtained at four and nine months. Results show a statistically significant difference ($t = -3.866$, $df = 69$, $p = 0.001$), with a Cohen's d effect size = .58 indicating that this difference is not attributable to casualness or to sample numerosness but, rather, to its intrinsic characteristics.

In order to understand if the differences between the four and nine months scores have been determined by a general change concerning all scales, or whether this change should be attributed to some of them only, a Multivariate Analysis of Variance (MANOVA) has been performed considering the families' total scores obtained from the LTP coding scales as dependent variable and "time" (2 levels: 4 and 9 months) as one within-subject factor. Results show a significant main effect of "time" at multivariate level ($F(10,69) = 3.142$, $p < .001$), as well as a univariate effect of the LTP scales: in other words, the scores of all scales significantly increased over time, between the first and second administration time (Graph 1).

Graph 1. Post-natal LTP Results observed at the 4th and the 9th month of the child

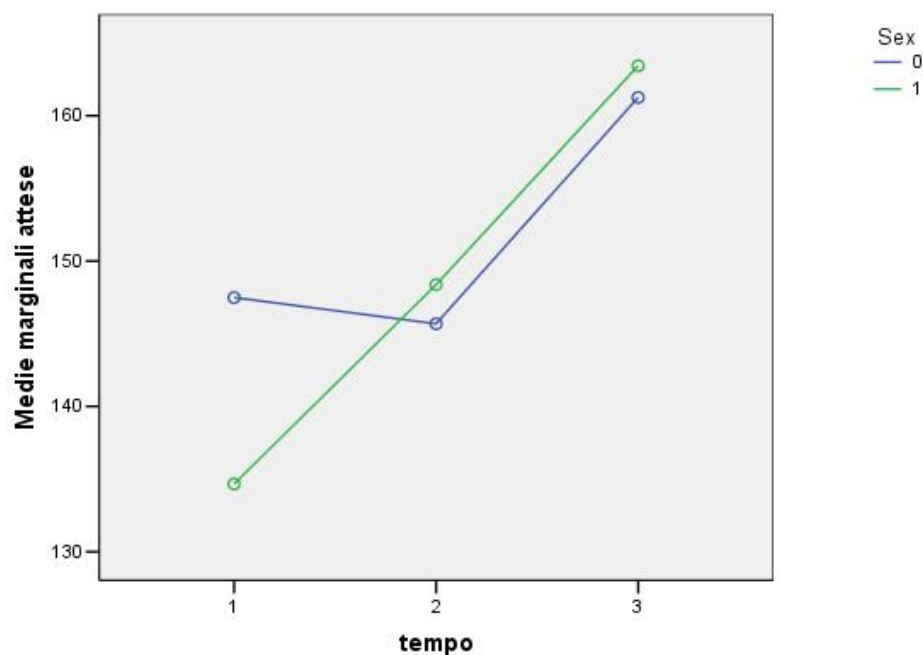


All the variables show a significant change over time, however, the major effect derives from the score of the following scales: Involvement of the child ($\eta^2p = .262$), Inclusion of the partners ($\eta^2p = .198$), Role Organization ($\eta^2p = .172$), Co-Construction Activity ($\eta^2p = .165$). These scales mainly assess the contribution of the child and his triadic interactive competences influencing the quality of interactions within a triadic setting with his parents, that is, his ability to take part in the interaction with two people simultaneously involved. In addition, these variables consent an assessment of the capacities of all members of the family system of interact as a whole: this seems to be a peculiar competence that evolves during the time thanks to the contribution of each of the components of the system itself.

The predictive role of co-parenting on triadic family interactions

The second aim of the study is to investigate whether and how the co-parental interactive competences displayed by parents during pregnancy may be associated with and/or are predictive of the interactive features of the mother-father-child triadic system at child's birth and during his first year of life. To this purpose, a Repeated Measures Analysis of Variance (ANOVA) has been performed considering the total LTP scores of each assessment stage as our dependent variable, and time (three stages of measurement: pregnancy, 4th month, 9th month) as one within-subject factor. Results show a significant main effect for "time" ($F(2,69) = 13.052$, $p < .01$). The Post-hoc test has been conducted using Bonferroni's correction of p values ($p < .05$) on the comparison of estimate means: it has revealed that the total LTP scores have increased significantly from 4 ($M=152.39$, $SE=4.24$, $p < .05$) to 9 months ($M=167.03$, $SE=3.21$, $p = .010$). In other words, there is a significant increase in the interaction level from pregnancy to mother-father-child interaction and is independent to the child's gender ($F(2,69) = 2.120$; $p = .124$, *n.s.*). The ANOVA analysis is able to verify the degree of association of the collected data during the time, in terms of the LTP prenatal and postnatal scores (Graph 2).

Graph 2. Increase of the LTP results from pregnancy to the 9th month considering child gender



However, this new evidence does not provide any information on the predictive role of the quality of interactions assessed during pregnancy in comparison to the interactions observed later on, that is, in a triadic setting including the baby. Pearson's correlation analysis has been applied to the total scores of the LTP at the three stages of administration: the analysis has found a significant positive correlation between the prenatal LTP score and the LTP score at the 9th month of the child ($R = .028$, $p < .05$). In view of this result, data have been submitted to linear regression analysis in blocks, choosing the total score obtained at the ninth month as our dependent variable and the total score obtained at the seventh month of pregnancy as our independent variable. Results highlight the predictive role of the co-parental score during pregnancy with regard to the level of triadic interaction when the baby is nine months of age ($R^2 = .069$, $F(1,69) = 5.063$, $p = .028$; $t = 2.250$; $p = .028$; $\beta = .263$). To sum up, we can state that the quality of the co-parenting interactions between parents-to-be in pregnancy is

predictive of the quality of triadic interaction with the baby, during the first year of life.

Discussion and conclusions

Our first research objective is to examine the development of early triadic interactions, with specific reference to two developmental stages - the 4th and 9th month of life - that are considered fundamental, at least as far as research on interactive competences and dyadic intersubjectivity is concerned. Results show how, between the 4th and 9th month post-delivery, there is a significant increase in the overall quality of family triadic interactions: this can be attributed to an increase in the global score of the LTP procedure. Moreover, when the main reasons for these modifications are investigated, it becomes evident that the most important contribution to this change is given by an increase in the scores evaluating the active role of the child within triadic interactions with two adults. This is the first evidence that supports the existence of early triadic competences already at four months of age: they are tied to the child's primary intersubjective abilities, which are manifested in a triadic interactive setting, and which seem to evolve during the first year and, particularly, at the fundamental, developmental stage of a child's ninth month of life, in connection with the emergence of secondary intersubjective competences. In addition, given the interactive nature of the variables used to evaluate both the behaviour of the child and that reciprocated by the adults, not only results do show a significant increase in the interactive triangular competences of the child when interacting with his parents, but they also show an increase in the ability of the adults to respond to the child's new needs and, finally, an increase in the competences of the family system and in the ability of its members to coordinate and co-regulate themselves, in order to succeed in managing the interaction. This fact seems to sustain the hypothesis that, within the family unit, the diverse elements which make up the system influence each other reciprocally via continuous and constant cooperation and coordination: an interactive circle is obtained from this influencing modes, whereby the actions of each partner influence and modify those of the others. From this process, both the triangular competences of the child and the functional ability of the system seem to arise as a whole.

Moreover, these results seem to go against those obtained by the Lausanne group (Carneiro, et al., 2006) which found a certain stability of the family interactive modalities over time, whilst in the present study, a significant increase in this competence can be seen between the 4th and the 9th month: it is necessary, however, to note a difference in the used

methods, since the data used by Carneiro et al. (2006) arise from a transformation of the ordinal data (scores obtained on the coding system scale) into categorical data which, in the view of the authors, reduces the possibility of identifying differences whilst increasing the stability of the measurement. Instead, in the present study, the choice made has been to maintain the graduation of the variables scale with the aim of highlighting any changes and their contribution to the developmental processes under investigation. The best way to understand discrepancies is to carry out further empirical work using larger subject groups, in order to be able to think about possible influencing factors linked to the different results obtained. In fact, even cultural variables could play a role in this complex transition period for couples entering parenthood, despite the fact that there are no control samples which would enable proper identification of any mechanisms underlying the differences we have found between the two studied groups. It is deemed necessary to carry out more research work bearing all this in mind, so as to try and solve the questions that have been left unanswered.

Our second objective has been to investigate if the quality of the interactive models developed by a couple during pregnancy could be predictive of the triangular interactive patterns that are put into effect after the child's birth. In accordance with previous studies (Carneiro et al., 2006; Frascarolo et al., 2006), the obtained results indicated that the parents-to-be's abilities observed at the seventh month of pregnancy are predictive of the family's interactive style when the child is nine months of age. In other words, an increase in the total score referring to the quality of co-parental interactive competences at the seventh month of pregnancy is matched by an increase in the total score referring to the quality of family interactive competences when the child is nine months of age. The data obtained through this research allow us to state that this new methodology can provide very valuable information in this field: observing and assessing the quality of parenting and co-parenting behaviors at the seventh month of pregnancy makes it possible to get relevant information on the relational style parents-to-be are going to adopt with their child. Specific reference is made here to various anticipatory behaviors, defined as intuitive parental behaviors (Papousek and Papousek, 1987), which can be performed by each partner prior to the child's birth and which reflect each partner's interactive ability as well as his/her cooperative attitude within the parental couple, once the two partners have become parents and start interacting with their child (Fivaz-Depeursinge, et al., 1996). This is a very useful feature of this tool, especially on a practical level, since it can become a support in developing parenthood: by observing the quality of the co-

parenting and care giving style within the parental couple as a predictive feature of the parents' behavior with their child, greater help and support in developing family interactive competences could be offered during a child's first year of life.

Some final remarks on these data. The longitudinal application of the LTP procedure shows that the observations derived are a reliable reference for clinical considerations and applications. The evidence of the predictive role of co-parental interactions observed during pregnancy on the subsequent mother-father-child interactions provides key information on how the transition to parenthood will take place and on how new parents will interact with their child. In sum, this highlights the application and preventive value of this kind of approach for an early identification of couples who might face difficulties in the co-parental function, so as to promote intervention before these difficulties can somehow threaten the socio-emotional well-being of the child and of the family as a whole. Thus, the prenatal LTP taps into the resources and vulnerabilities of parents-to-be before the arrival of their first child. In fact, assuming the early family interactions is a developmental issue of increasing importance during the child's first year of life, it is really extremely relevant, from a clinical point of view, to be able to predict this family characteristic already at prenatal stage. In fact, one possible goal for future research would be to clearly define interactive patterns, so that we can identify families at risk or else detect their protective factors in the "transition to parenthood" processes. This perspective could promote the application of the LTP procedure as an assessment tool, notably for prevention (particularly the prenatal LTP procedure): early parenting assessment could be a useful way to intervene in situations at risk earlier than has previously been possible, or to sustain protective factors that are present (Fivaz-Depeursinge, Corboz-Warnery and Keren, 2004).

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