



## **PRENATAL MATERNAL PSYCHIC DEVELOPMENT AND FETAL BEHAVIOR: AN INTERACTING REALITY**

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### **ABSTRACT:**

Psychological development during pregnancy and along transition to parenthood stood under scientific attention during the second half of the twentieth century. Research yielded data suggesting that human adaptation to the reproductive steps of the life cycle is very important in our quest for quality of life. Namely, studies of maternal prenatal emotions revealed the existence of a relationship between, on one side, pregnant women psychological functioning and, on another side, obstetric health, labor and delivery vicissitudes, newborn's health and behavior, etc. Recently studies about prenatal stress showed how important intrauterine experiences can be for babies' development. Interventions dedicated to prevent negative consequences induced by maternal stress should be organized as early as possible in human life. In this sense, it is argued that positive aspects reinforcement, both in the mother and in the baby as well as in family functioning, should be seen as the major focus in relational strategies assumed by professionals operating in this field.

### **Key words:**

Psychological development during pregnancy; Maternal prenatal emotions; Obstetric health; Newborn's health and behavior; Prenatal stress.

The evolution of the human species induced many interesting adaptations which are detectable in a huge number of observable characteristics. Among these, medical knowledge has pointed some aspects that led humans to a better interaction with the permanently changing environment where we live. Particularly, adaptations related to reproduction do signal, remarkably well, the way we get around so many obstacles that stand in our way to survival. The fact that humans stand most of the



time in a nearly vertical position, together with the increasing cranial volume of our newborns, turned more difficult for human babies to cross the birth canal at the crucial moment of delivery. To overcome this delicate situation, a singular solution was adopted: human babies must always be born prematurely. Consequences of this strategy are therefore present in delivering women, in newborns and probably in their fathers. It is quite consensual that in the organism of human females there is not a unique mechanism for delivery triggering but instead several mechanisms are present; if one of these will fail another one will be working in order to induce delivery. Once that delivery is triggered several factors of mother's anatomical plasticity will be used (e.g., anterior and posterior diastases). About babies' organisms several anatomical specificities will cooperate for that an earlier birth will turn successful: a) the anterior and posterior fontanelles will offer some cranial flexibility and b) the fact that at birth the outer layers of the baby's neocortex are not yet fully matured prevents the induction of lesions at that part of the brain, etc. Last but not the least, endocrine changes in expecting fathers like increase in prolactin hormone or decrease in testosterone hormone in newly fathers (Storey, Walsh, Quinton & Wynne-Edwards, 2000) are seen as evidence that human males undergo a process of adaptation which turns them more cooperative with the delivering woman as well as more cooperative with the birthing baby.

From the psychological point of view, several signals in pregnant women development were identified at the middle of the twentieth century and served as a powerful stimulus for scientific scrutiny around everything that could be understood as maternal or parental investment towards healthier and informed maternity and paternity.

Following some seminal contributions (ex., Benedek, 1952; Deutsch, 1945), concepts like "primary maternal preoccupation" (Winnicott, 1958), protection as a characteristic of pregnancy and the view that human gestation is not only a matter of biological developmental (physiological, anatomical, etc.) but also a period of psychological development (Bibring, 1959; Bibring, Huntington & Valestein, 1961a; Bibring, Huntington & Valestein, 1961b; Colman & Colman, 1971) offered a new light in those domains. Much the same way as in cognitive development, pregnant women development should implicate a sequence of phases with their respective goals, tasks, instruments and changes in several domains of everyday life.

On the side of medical knowledge, pregnancy is also seen as a sequence of phases related to embryonic structures development: a) first trimester - a period dedicated to the emergence of structures, b) second trimester - dedicated to the expansion of structures and c) third trimester - a special phase for structures maturation. It is hard to be sure but possibly this idea influenced Bibring's contribution about the view of pregnant women's psychological development when she proposed that: I) a first phase (coinciding with the first trimester of gestation) would have pregnancy integration as main goal, implying pregnant woman's regression to childhood as well as the re-elaboration of her relationship with her mother, using a psychological tool known as introspection; II) a second phase (corresponding to the gestational second trimester), where the main goal would be mother-fetus differentiation, consisting on the pregnant woman's resettling with present time and re-elaboration of her relationship with the marital partner, using a psychological tool known as "extrospection"). As a conclusion, according to the Colman couple (Colman & Colman, 1971), we should consider a third phase (happening during the third trimester of pregnancy), with the main goal being separation between mother and child, based at pregnant woman's progression relatively to the moment when the baby will be already born and consisting in the re-elaboration of her relationship with her future son while using a psychological tool that we would like to designate as "maternal-sepection").

Simultaneously with many doubts triggered by these three phases of maternal development during pregnancy, a particularly intriguing question emerges in this field: what is it that pushes preg-



nant women to jump from one phase into the subsequent one? About the shift from the first to the second one it has been argued that the beginning of maternal perception about fetal movements is the factor we are looking for. To reinforce this conclusion it must be acknowledged that the beginning of this perception usually occurs by the beginning of the second trimester. Now, about the shift from the second to the third phase, studies of fetal behavior are suggesting that near the transition from the second to the third trimester prenatal babies' behavior becomes more patterned (Einspieler, Prayer & Prechtl, 2012). By this time, pregnant women start to predict the most likely moments for babies' behavioral outbreaks. It is not uncommon to listen these women saying that their unborn babies already got a clock inside of them.

This general view about the "usual" process to go along gestation may also be useful if threatening or stressful events or even "medical conditions will arise at the horizon; the medical prognosis of the mother's or of the fetus may become compromised and, on the side of maternal psychological functioning we may face a kind of "standby reaction". If so, psychological development will be suspended and women's ability for deep emotional involvement will be like frozen; the use of defenses related to contact with the women's impulsive life will decrease and at the same time the increase of defenses related to rationalization, denial an reversal of frustrating situations will be observed (Justo, 1990).

Several obstetrical conditions showed to be related to pregnant women's psychological functioning: hyperemesis gravidarum, second trimester spontaneous interruption of pregnancy, late eclampsia, preterm labor and preterm delivery. Very interesting is the time at which these conditions arise. Articulating the phases of psychological development with the timing at which we expect those conditions to happen, it is supposed that: a) hyperemesis gravidarum becomes likelier when integration is not set in motion, b) second trimester spontaneous interruption of pregnancy happens when differentiation does not starts (possibly because integration was not completed), c) late preeclampsia and late eclampsia may take place at the clinical landscape when differentiation is not completed and therefore separation does not begins and, finally, d) signals of preterm labor may emerge when separation is not being achieved by the last trimester (Justo, 2002).

At the present time, besides the connection with obstetric events, maternal development is also connected with delivery issues and with the baby's behavior. Specific emotional circumstances may have implications like: a) labor being too long or too short, b) medical instrumentation being required, c) repeated medication be needed to regain control and d) caesarean birth becoming an option for medical staff to overcome a process that will possibly harm the mother and the baby (for a review see Justo, 2005).

It may also be the case that emotional experiences of the pregnant woman will play an important role on fetal behavior determination (Van den Bergh, 1990; Groome, Swiber, Bentz, Holland & Atterbury, 1995). Something similar may happen with fetal stress: 1) maternal stress is capable of inducing fetal stress through the stress hormonal axis; 2) corticosteroids do increase some fetal structures maturation, 3) for that reason some preterm babies are not as premature as they should, 4) this will increase probabilities of fetal organic lesions and 5) some behavioral changes are supposed to be linked to the accelerated maturation of the brain (Salihagic-Kadic, Medic, Kurjak, Andonotopo, Azumendi, Hafner & Milenkovic, 2005).

If maternal prenatal psychological experience is connected with so many issues of fetal life it becomes inevitable that prenatal maternal variables will play a part at the postnatal infant's behavior. Farber, Vaughn and Egeland (1981) showed that newborns rated optimal at NBAS state control were delivered by mothers having the lowest scores in prenatal anxiety evaluation. At the same investigation, it was noticed that female newborns delivered by mothers having the highest rates of prenatal anxiety were rated as less alert and less active by nurses and had worrisome scores at



NBAS scale of orientation processes. The same researchers observed that three and six months after birth mothers that had higher scores of prenatal anxiety presented worst maternal abilities in feeding and playing situations with their babies as well as less positive affect. Finally, these data evidenced that maternal cooperation and sensitivity assessed by Mary Ainsworth scales at six months after birth correlated negatively with prenatal maternal anxiety.

Because maternal prenatal emotions do have a physiological substratum, research about prenatal psychological times went to a deeper level. For a start, infants exposed *in utero* to high levels of cortisol tend to be delivered sooner and, after birth, they are prone to cry more, to be fussier and to show more negative facial expressions (Weerth, van Hees & Buitelaar, 2003). Because pregnant women with higher scores of averseness to infant crying become mothers of babies that at three-month are rated with higher levels of fussy, difficult and unpredictable behavior (Pedersen, Huffman, del Carmen & Bryan, 1996), one should be particularly alert to maternal pre and postnatal sensitivity. Once that infant crying is viewed as one of the first and most important babies' inputs while interacting with their mothers, prenatal maternal negative appreciation relatively to babies' communication can be seen like a warning signal at the domain of emotional transactions at the field of humans' first moments of life.

According to recent data (Davis & Sandman, 2010), prenatal maternal cortisol levels are related with development during the first twelve months of baby's life and, more interestingly, this relationship is not a linear one: 1) by the fifteenth week of pregnancy lower cortisol levels predict accelerated mental development of the baby by the third, by the sixth and by the twelfth month of age with better cognitive results by the last moment of assessment; 2) by the thirty-seventh week of gestation higher cortisol levels predict accelerated mental development of the baby at the three postnatal moments of assessment providing better cognitive performance by twelve months; 3) at twelve months of age best results on cognitive development were observable in babies that during intrauterine life were exposed to a specific cortisol pattern (lower levels before the eighteenth week of pregnancy, acceleration along pregnancy and higher levels from thirty weeks on); d) when the cortisol slope is included in regression analysis, maternal cortisol impacts earlier and later in pregnancy are no longer significant, i.e. the cortisol profile along gestation is much more important than cortisol levels.

Because maternal stress is so negative and because it can start to act so early in fetal life, while contacting multi-challenged families at transition to parenthood, professionals of all areas may be overwhelmed by negative expectations. Nevertheless, investigation is showing that mothers' behavior is of crucial importance for the reparation of difficulties of babies' development, especially when communicating with them during the first year of their lives. Getting together prenatal maternal negative emotional states, on one side, and observations of mother-infant interactions in laboratory stressful settings and also scores of infant development, on the other side, one may conclude that: 1) maternal sensitivity plays an important role as moderator variable between anxiety in pregnancy and infants' behavior at the still-face situation (Grant, McMahon, Reilly & Austin (2010b)); b) maternal sensitivity may also be considered as moderator variable between anxiety in pregnancy and mental development of the infant (Grant, McMahon, Reilly & Austin (2010a) and c) the style of attachment moderates the impact induced by prenatal cortisol exposure upon the cognitive development of the baby (Bergman, Sarkar, Glover & O'Connor, 2010).

At a first glance, these contributions seem to place a heavy burden upon mothers' skills and competences. Especially, when objective conditions act pro stress and against health, we may ask: is there enough maternal resilience to foster good quality interactions with babies. About this question, professionals involved at supporting families should be reminded of two things. First, fetal and infant communication has got rewarding characteristics that if used in an appropriate way can make



the difference in terms of maternal and familial perseverance. Second, maternal and familial perseverance need to be reinforced positively; moments when professionals underline infants' rewarding communication are of the utmost importance for mothers and families to progress in a healthy way.

The fact that mothers' investments can foster babies' development after experiences of prenatal stress and also can help to surmount sequelae induced by that stress allows two conclusions: 1) growth, development and maturation of our babies is a permanent possibility apart obstacles standing at the clinical and social landscape and 2) information proceeding from the mother and directed contingently to the baby's initiative is the most important aid an infant may get for the reinforcement of his motivation to thrive.

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