

# VERY EARLY ATTACHMENT DEVELOPMENT IN THE PREMATURE INFANT

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## Summary

### Aims

To observe and analyze the autonomic and behavioral states of preterm newborn infants, while interacting with mothers and nurses, aiming to detect signals of attachment during early stages of development.

### Methods

The subjects of the investigation were ten clinically stable infants born between 24 and 28 weeks of gestation, with a birth weight less than or equal to 1250g and free of congenital anomalies.

Infants were video recorded weekly for periods of twenty minutes: ten minutes interacting with their mother and ten minutes interacting with a nurse. These recordings were sequentially performed until the patients completed 40 postconceptional weeks. Variations of heart rate (HR), oxygen saturation (O<sub>2</sub> Sat) and facial signs such as gaze, smile, cry and frown connected to the presence of the mother and nurse were registered every two minutes. The first two parameters were obtained from the infant's monitor and the four behavioural categories from videotape observations performed by two trained researchers who showed a high degree of reliability and consistency.

Trend Function was the statistical tool used to evaluate infant's autonomic and behavioural differences during the interaction with mothers and nurses. Each of the parameters measured was analyzed using gestational age as the independent variable.

### Results

- 1. Heart Rate:** When touched by the mother the infant's heart rate consistently increases until approximately the 30th week. After the 30th week the curve inverts (heart rate decreases) and this relation remains constant until the 40th week. No significant variations occur while the baby is being handled by the nurse.
- 2. Oxygen Saturation:** Lower O<sub>2</sub> Sat values are seen during interaction with the mother until the 31st week, after which the curve inverts and O<sub>2</sub> Sat are significantly lower during interaction with the nurse.
- 3. Cry:** Until the 32nd week the premature infant cries more with the mother than with the nurse; from that week on he cries more with the nurse.
- 4. Frown:** After the 28th week the baby shows greater frequency of frowning with the nurse than with the mother.
- 5. Gaze:** After the 28th week the frequency of gazing was greater with the mother than with the nurse.
- 6. Smile:** Throughout the observation the baby smiled more while interacting with the mother than with the nurse.

[See five graphs illustrating these results](#)

## Conclusions

Autonomic parameters (HR and O2 Sat) show more alterations in the early stages when babies interact with their mothers than with the nurses, perhaps reflecting maternal fear and anxiety during contact and/or differences in their skills.

Babies cried initially more with their mothers but significantly less after the 32nd week. A striking difference in the other three behavioural parameters was observed during the interaction between baby and mother (more gaze and smile) and between baby and nurse (more frowning).

This interaction differentiation occurs as early as the 30th week of postconceptional age. The repetitive and increasingly prolonged periods of contact of the mothers with their infants facilitates interaction and thereby attachment.

It will be crucial in future investigations to study infants and mothers' specific behaviour simultaneously in order to better define the dynamic of the interaction and the mechanisms involved.

Attachment involves proximity-seeking, distress on separation and comfort on re-union and results from maternal attunement to a wide spectrum of infant biological and affective states and the corresponding signals.

The human infant appears capable of emitting elicited attachment signals to their mothers at very early stages of development.

Mothers seem to identify and probably respond to those signals after a variable period of adaptation necessary to recover from the profound impact produced by the birth of an extremely premature infant and the anticipatory mourning and other emotional alterations that usually accompany the event.

## Implications for psychoanalysis

Attachment leads not to a behavioral set or a particular quality of the baby but to a peculiar emotional relationship between the baby and the caretaker. Like any other relationships, attachment develops with the passing of time. It is the result of dyadic interactive history. There is no such thing as immediate attachment.

The dyadic relationship continues postpartally between the caregiver and the infant, the behavior of one reinforces the behavior of the other. The infant level of neurophysiological development influences the appropriateness of maternal and caregiver behaviors. Because the young preterm infant's priority is mere survival, interaction with the environment and care providers is at the expense of physiological stability.

According to synactive theory Als (1978, 1979, 1981) the premature infant needs in the stage of very early life, organization along five subsystems of functioning: autonomic system, motor organizational system, state organizational system, attentional-interactive system, self regulatory system. Early on the issue that the human preterm newborn is grappling with is the stabilization and integration of respiration, heart rate, temperature control, digestive function and elimination competence.

As the motor system gets energized, movements and active postural adjustments may infringe on the early balance, as to tactile and vestibular manipulations brought from the outside of the infant, possibly sending him into apnea or other defensive strategies, such as bowel movements or spitting up.

Gradually, the full range of state from sleep to awake to crying emerges; states become clear rather

than being diffused and increase in flexibility, again initially impinging on motoric stability and possibly even on psychological stability.

Finally the alert state becomes robust and well differentiated within the other states often initially disrupting motor control and psychological balance. Gorsky et al. (1979) have based the clinical description of the preterm infant on this formulation and speak of the "in-turning" or psychological stage; the "coming out" or first active response to the environment, and the stage of "reciprocity", the ultimate stage of environmental opportunity which corresponds to the agenda of the full term healthy newborn

According to our study from the very early stages of life when biology is determining factor, the premature baby shows signs which could be interpreted as attachment. Comparing the frequency of the different signals such as heart rate, oxygen saturation, gaze, frown, smile and cry between mother and nurse shows clear differences which up to now had never been explored.

It would be necessary to increase the number of samples to confirm those differences. Then the concept of attachment in the early stages of the life could be added, expanding the present frontiers of attachment theory.

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## Keywords

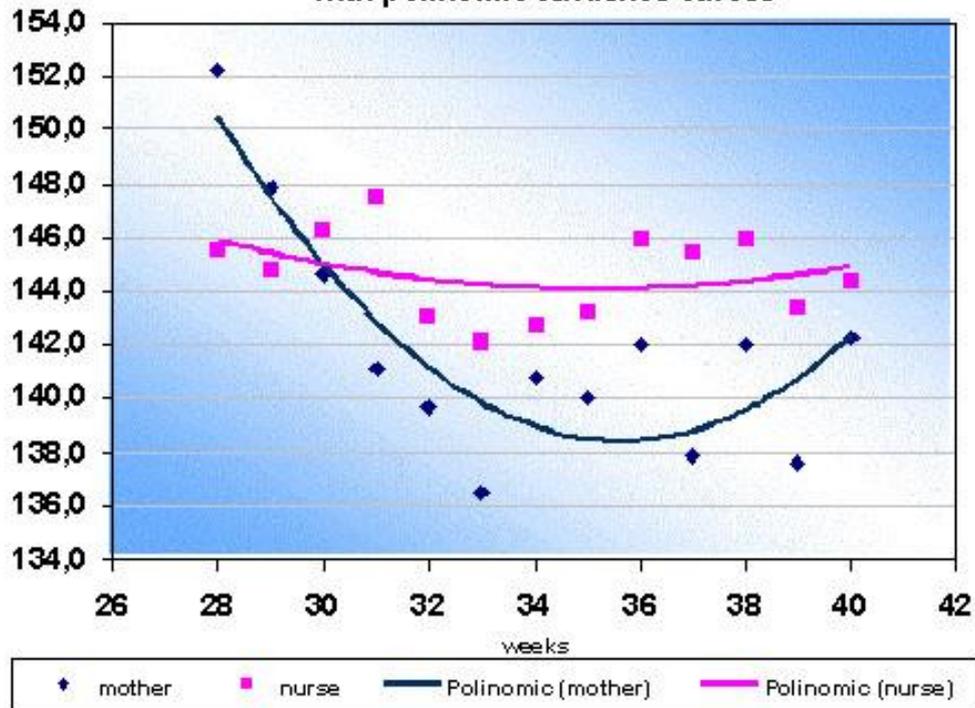
Behavioral organization, biological foundations of neonatal behavior, caregiver factors, early attachment, facial expression, premature infant, synactive theory

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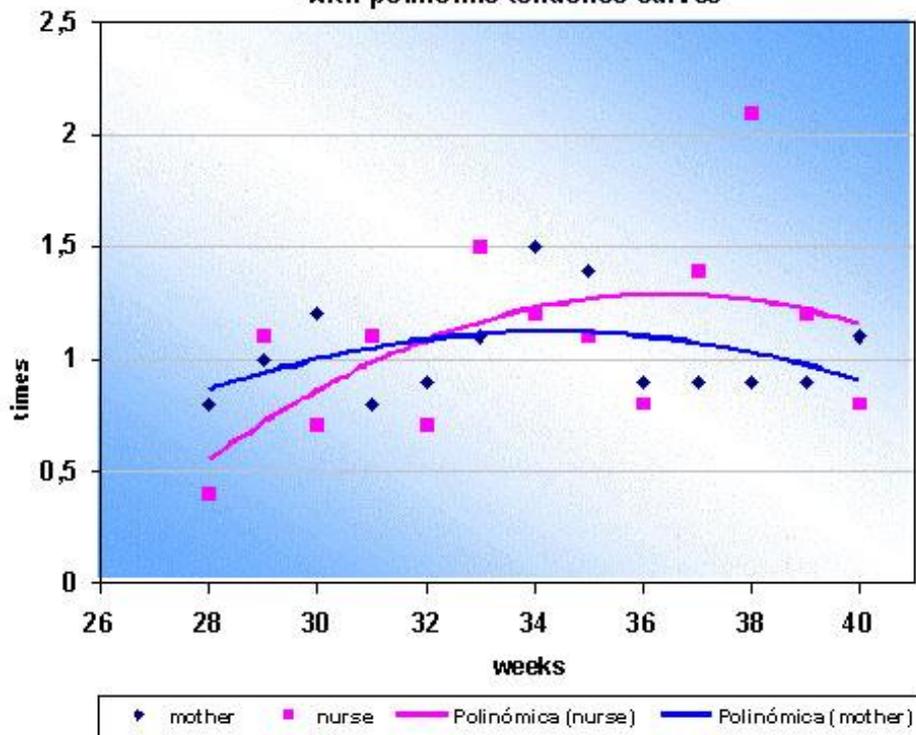
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## Heart Frequency Average - Dispersion Chart with polinomic tendence curves

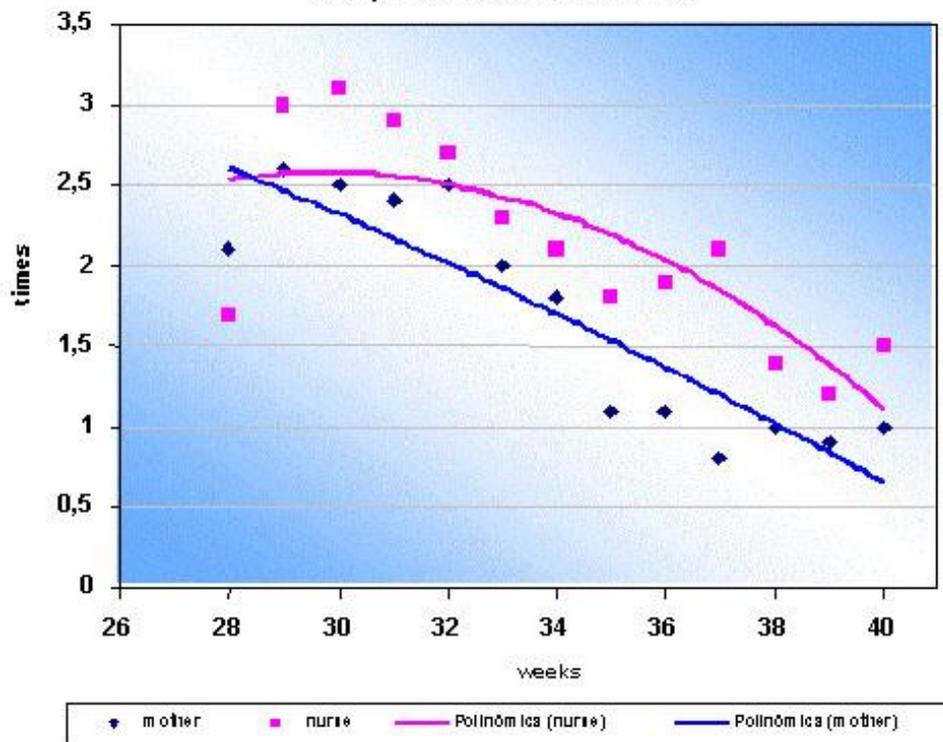


## Crying Average - Dispersion Chart with polinomic tendence curves

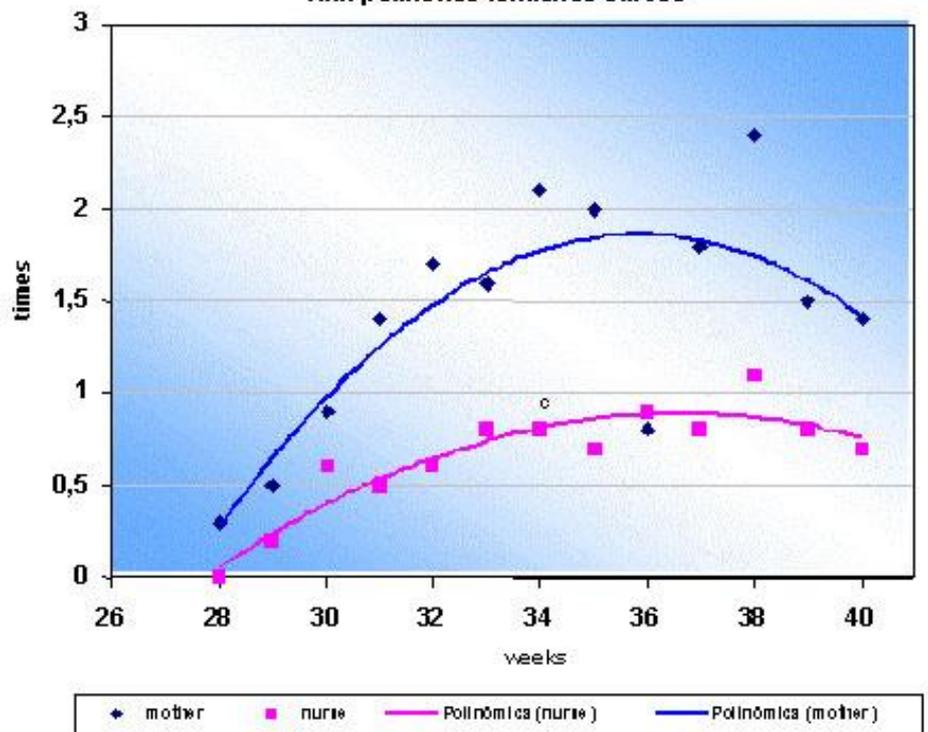


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**Frown Average - Dispersion Chart**  
with polinomic tendence curves

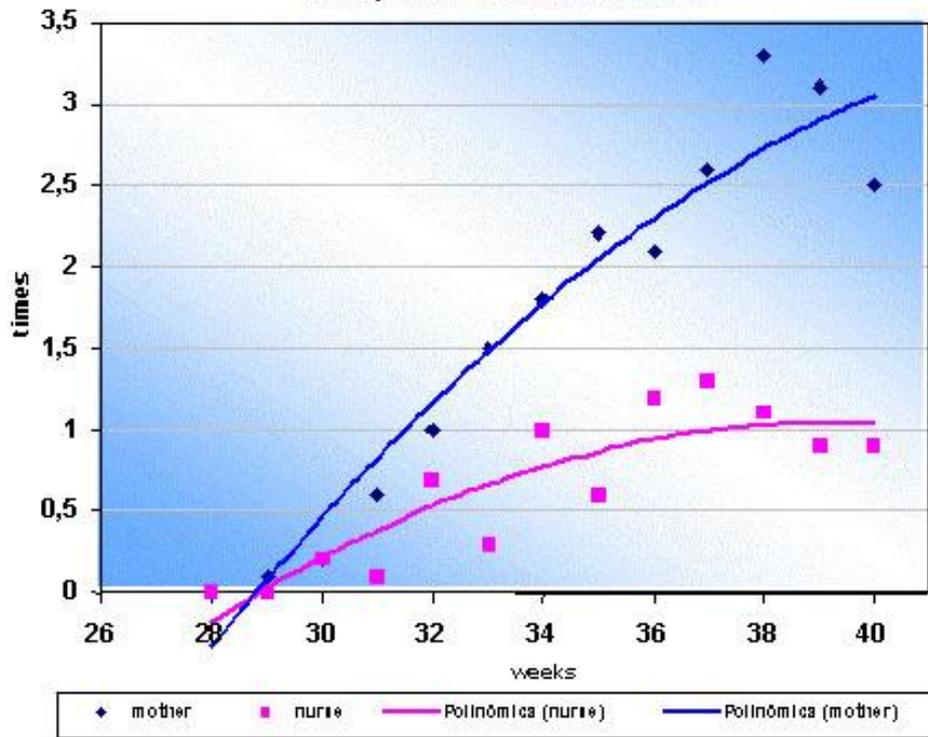


**Smile Average - Dispersion Chart**  
with polinomic tendence curves



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Gaze Average - Dispersion Chart  
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