

**REPORT TO THE RESEARCH ADVISORY BOARD OF THE INTERNATIONAL
PSYCHOANALYTICAL ASSOCIATION***

1. Title of project:

“Microanalytic study of changes in psychotherapeutic processes using verbal and non verbal indicators”.

2. Principal investigators:

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3. Amount of money awarded:

US\$ 8000

4. Dates of beginning and end of proposed renewal period:

Beginning: June 2001

End: June 2002

Hypothesis 1

5. Brief summary of Research objectives:

The first phase of our project “*Comparing verbal exchange of mother and analyst and non-verbal interaction between mothers and babies with functional problems*” showed that brief interventions have an impact in the attachment indicators in our sample of ten cases. We didn't find significant correlation for the verbal measures in the mother and therapist's speech and the attachment indicators in the mother- baby interaction. (the verbal and non-verbal measures were studied following a 150 words block segmentation of the sessions).

The data showed that this model of psychotherapeutic intervention¹ had a positive impact in the attachment indicators as measured by Massie- Campbell. We also found that moments of productivity in

¹ The goal of these psychoanalytically oriented consultations with mothers and their babies is to help the mother to better understand her emotions, especially when interacting with her child in the therapeutic situation itself, but also in a retrospective manner when she reports narratives about past events including the baby. A psychotherapeutic objective is to enable the mother to (re) adjust to her baby in direct response to its non-verbal interventions by connecting the baby's gestures and behaviour with emotions and by verbal expressing of such. The work takes into account both: the interpretation of meaning and different projections the mother does on the baby and the observation of the interaction as it takes place in the session. These psychotherapeutic interventions aim at the reorganisation of the mother-baby bond and do not attempt to encourage regressive processes within the mother. (Altmann et. al., 1992, 1993, 1995, 2000).

the verbal exchange between the mother and the therapist are not necessarily moments of activation of non verbal attachment indicators between the mother and the baby.

This design enabled us to study the relationship between verbal and non verbal measures. We found that analysing the data between the verbal exchange and the non verbal interaction in a parallel way does not show any correlation between the two systems. In order to study if there is a non parallel correlation in the process in each case in a micro-analytic level a new phase of the project had to be implemented.

The objective of this new phase of the project is to investigate in a micro-analytic level the relationship patterns in the psychotherapeutic process with the idea of identifying which channels impact in others and can be considered paths for psychotherapeutic changes *in each patient*.

The purpose of this new phase is to focus in the following questions:

- **How the different relationships between verbal and non verbal variables take place?**
- **Which variables produce an effect in the mothers mind?**
- **How does the mother response to the childs behaviour: in a non verbal way or in a verbal way and how many lags after?**

Sample: Same as in the previous projects. First and last sessions, fully videotaped and transcribed, of brief psychotherapeutic process with ten mother-baby dyads. The babies suffered from psychofunctional problems. The study will follow the same segmentation (blocks of 150 words).

Case N.7 will be presented in this report.

6. Overview of work accomplished to date (including publications and presentations)

a) Publications

Proceso y cambio a través de dos metodologías: entre la clínica y la investigación. Angulo, B., González, E., Nogueira, G., Sasson, E., Altmann M. (Coord) y Corti, A. In Publicación del Primer Congreso Uruguayo de Psicología Médica y Medicina Psicosocial, 1999, pp. 249-258

Acerca del vínculo no verbal entre la madre y su bebé. Altmann, M., Angulo, B., Brovetto, E., Nogueira, G., Perkal, A., Próspero, S., Sasson, E., González, E., Viera, M., Corti, A. in Investigación en psicoterapia. Procesos y resultados. Investigaciones empíricas 1998. SPR. Capítulo Sudamericano. Ed. Educat, Pelotas, 2000, pp. 169-188.

Del lenguaje a la conducta. Gril, S., Altmann, M., Mergenthaler, E. in Investigación en psicoterapia. Procesos y resultados. Investigaciones empíricas 1998. SPR. Capítulo Sudamericano. Ed. Educat, Pelotas, 2000, pp. 227-245.

Relación entre el duelo y el apego en el vínculo madre-bebé. Desde la clínica a la investigación empírica Altmann, M.; Gril, S. in Los duelos y sus destinos. Depresiones, Hoy. Asociación Psicoanalítica del Uruguay, May 2000, Tomo II, pp. 219-223

La relación entre el intercambio verbal de la madre con el analista y la interacción no verbal de la madre con su bebé. Altmann, M.; Gril, S. & cols. In Investigación en Psicoanálisis y Psicoterapia. Trabajos presentados en el Primer Pre Congreso de Investigación en Psicoterapia y en Psicoanálisis. Santiago de Chile. Julio 1999. CPU-IPA-SPR. 2001, pp. 119-134.

Lo cotidiano en la vida de los bebés. Altmann, M. et al. In Publicación del 4º Encuentro nacional de Educadores del INAME. Las prácticas educativo-sociales con niños, niñas y adolescentes en la vida cotidiana. UNICEF- INAME, 2001, pp.95-109.

Acerca del vínculo temprano. Distintos modelos teóricos. Altmann, M. et al, para INAME. En el marco del Proyecto de Cooperación Uruguay-España sobre Primera Infancia 2001 (in press)

b) Presentations at Congresses, Meetings, Seminars, etc.

“Observando la conducta de los bebés” Post-grade Seminar at Universidad Católica del Uruguay, July 2002.

“Nuevos desarrollos sobre el vínculo temprano. El Apego.” Seminar at Universidad del Desarrollo, Santiago, Chile, August 2002

“Verbal and non-verbal indicators in psychotherapies with mothers and babies” (IPA Award July 2001) Presentations at:

- FLAPIA (October, 2001) Discussant: Robert Emde
- Asociación Psicoanalítica del Uruguay (November, 2001)
- Sociedad Uruguaya de Psicología Médica y Medicina Psicosocial (March, 2002) Discussants: Dr. Ricardo Bernardi-Dr. José Díaz Roselló
- the Asociación Psicoanalítica Chilena (Agosto, 2002)

7. Tasks outstanding to accomplish objectives.

This paper will report the first hypothesis we mentioned in the project.

Hypothesis 1)

There is a cross-lagged relation between the verbal exchange as measured by the Cycles Model (Mergenthaler) and the Attachment indicators as measured by Massie-Campbell (non-verbal).

Definition of variables:

Massie-Campbell Scale of Infant Attachment Indicators during Stress (Massie-Campbell, 1984)

The indicators are defined as follows:

Gazing (GA): The eye-to-face contact within a dyad and the maintenance of this contact. E.g. The infant initiates looking at the mother, the mother responds by smiling at the infant and showing pleasurable affect.

Holding (HOL): The mutually reciprocated posturing of the infant and mother while the infant is supported in the arms of the mother: the infant molds to the mother, the mother responds by anticipating the infants wish to mold and matches the infants rhythm in regard to this movement.

Vocalizing (VOC): The making of vocal sounds for the benefit of the parent-infant dyad. The infants crying is considered a signal of dismay during stress. Which alerts the parent to its tension.

Touching A (TOA): Skin-to-skin contact initiated by either parent or infant, not for physical support; the infant reaches out to touch the mother; the mother responds by reaching out to the infant in a rhythm appropriate to that of the infant.

Touching B (TOB): The withdrawal from skin-to-skin contact initiated by either parent or infant.

Touching A and B does not refer to contact in the service of holding, clinging, or body support. Rather, it refers to playful grooming, affectionate, communicative, or other touching that may be expressed by fingers, hands, feet, toes or face nuzzling.

Affect (AFF): The facial expressions signalling emotional states. An unclear, slightly anxious, alert, attentive, or bland expression is considered typical of the individual under stress and is appropriate.

Proximity (PROX): The state of being near, close to or beside another. In the context of the Scale it refers to the infants maintaining either physical or visual contact with the parent, and to the parents maintaining physical contact or being immediately accessible to the infant.

The responses in each attachment modality are graded from 1 to 5 to indicate the increasing intensity of mother-infant involvement.

Cycles Model (Bucci-Mergenthaler)

Referential activity (HIP): is defined as the activity of the system of referential connections between verbal and non-verbal representations. The referential activity measures assess the degree to which a speaker is able to translate such experience into words in a way that will evoke corresponding experiences for the listener. The measure tells us whether or to what extent non-verbal, including emotional, experience is likely to be activated in the speaker's mind as he generates his discourse.

“The referential process is defined as the function of connecting non-verbal experience, including emotional experience, with language (Bucci, 1993, 1995, 1997). The speaker (or writer) transforms inner experience into verbal form; the listeners (or readers) transform the words of others back into their own non-verbal representational systems. The referential process has central importance in any discourse context, wherever inner experience –images, ideas, emotions, sensations— must be captured and communicated in words.”(Mergenthaler, E & Bucci, W. 1999 p. 339 “Linking verbal and non-verbal representations: Computer analysis of referential activity. British journal of medical Psychology, 72, 339-354. the British Psychological Society)

Emotional Tone (ETP): measures the density of emotionally tinged words within a given text unit and thus serves as a marker for the activation of emotional schemata.

Abstract words (AWP): measures the density of abstract nouns and serves as a marker for reflective processes

When the indicator measures the baby's behaviour, number 1 is preceded by the name of the indicator, e.g. GAZ1, if we are talking about mothers' behaviour number 2 is preceded by the indicator, e.g. GAZ2.

To test this hypothesis the following studies were performed:

Find an unidimensional time series model for each variable in each case.

Steps performed:

1. *Estimate missing values* using linear interpolation
2. *Differentiation of series*

The objective of this procedure is to get rid of the trend of the drift. (So we partialize correlations and the mean of the different series is dislocated.) Stationary series will be obtained

3. *Calculate Autocorrelation function and Partial autocorrelation function* for each individual and each variable (240) to identify models (ARIMA)

The first objective was to find a time series for each variable in each individual. We used the Box-Jenkins method. Firstly we took first-order differences to get rid of the trend and then we used the auto-correlation function (ACF) and the partial auto-correlation function (PACF).

4. Estimation of models

Essentially, two types of time series were identified:

- auto-regressive order one (AR1)
- random walk (RW).

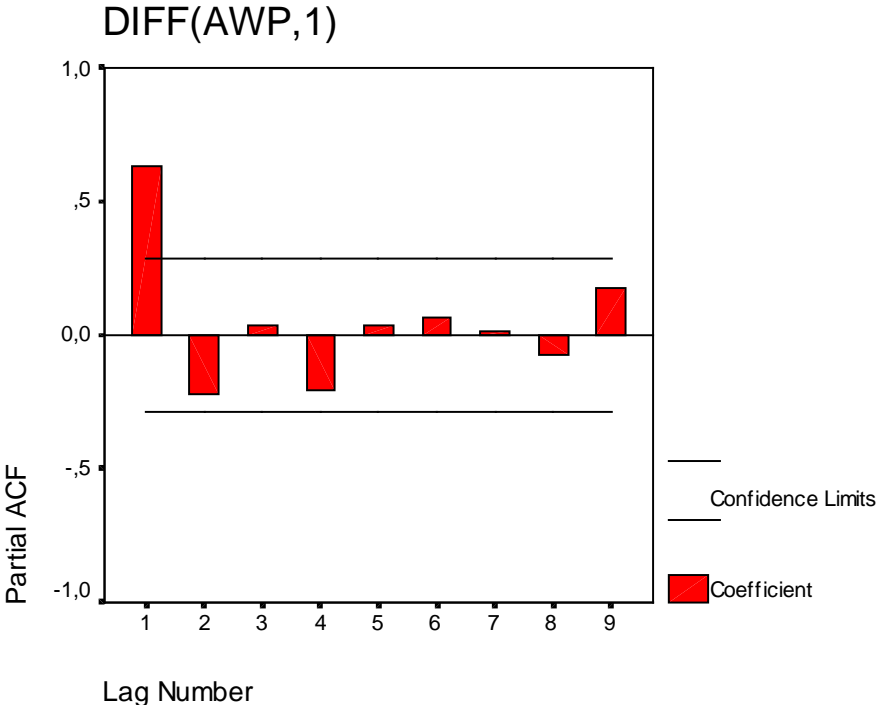
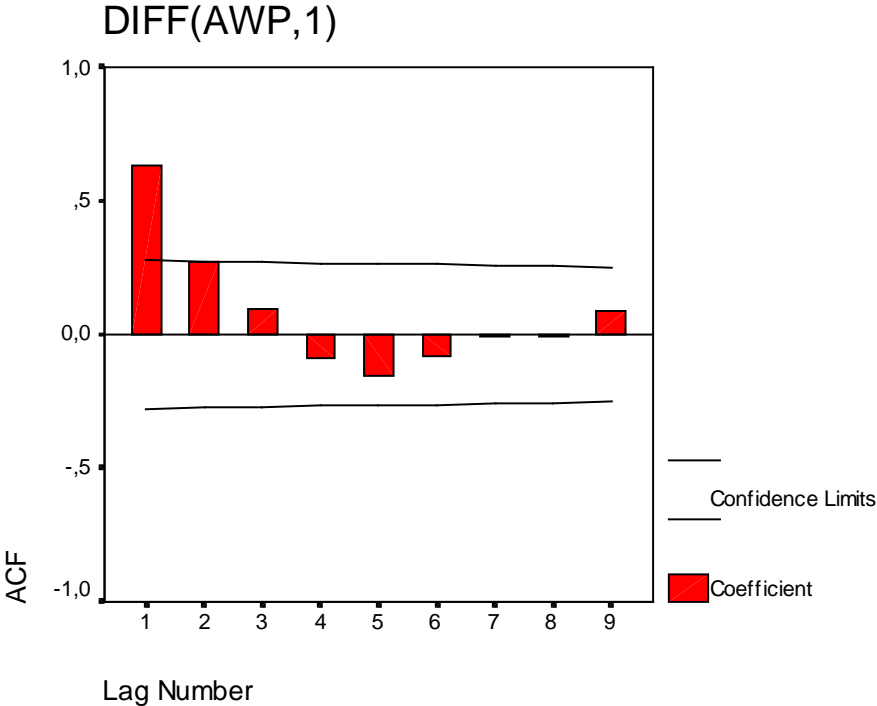
The auto-regressive model order one ($Y_n = a + b Y_{n-1} + E_t$) ties linearly the value of a variable with its value in the time $t=n$ with its value in the time $t=n-1$ at less than a white noise.

This means that what happens a lag before affects linearly what is happening in the actual lag.

The random walk model means that the difference between the value of a variable in $t=n$ and its value in $t=n-1$ is a white noise

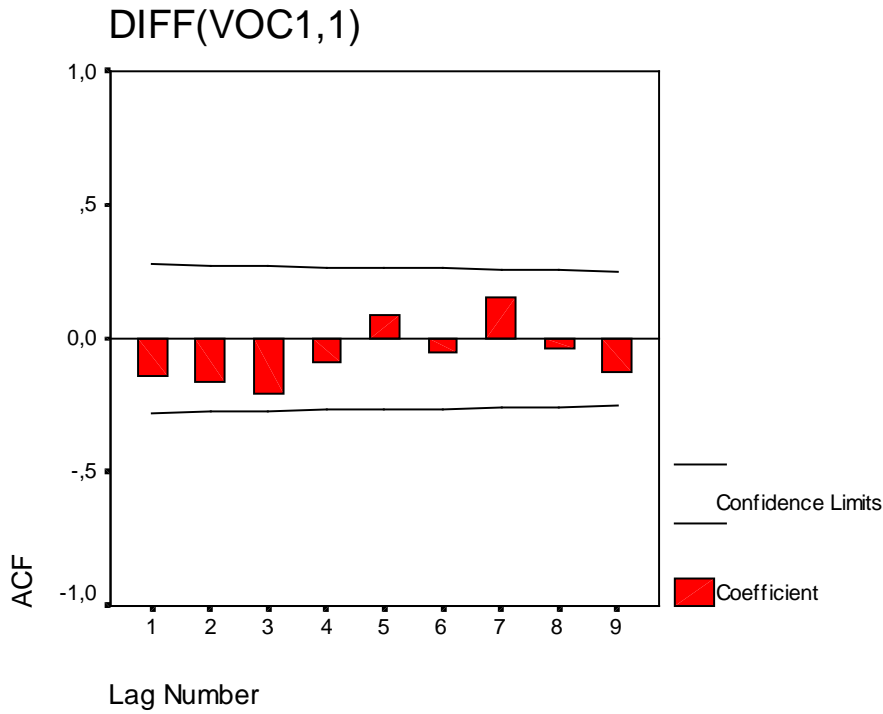
Then we estimate the parameters and the adjustment of the models.

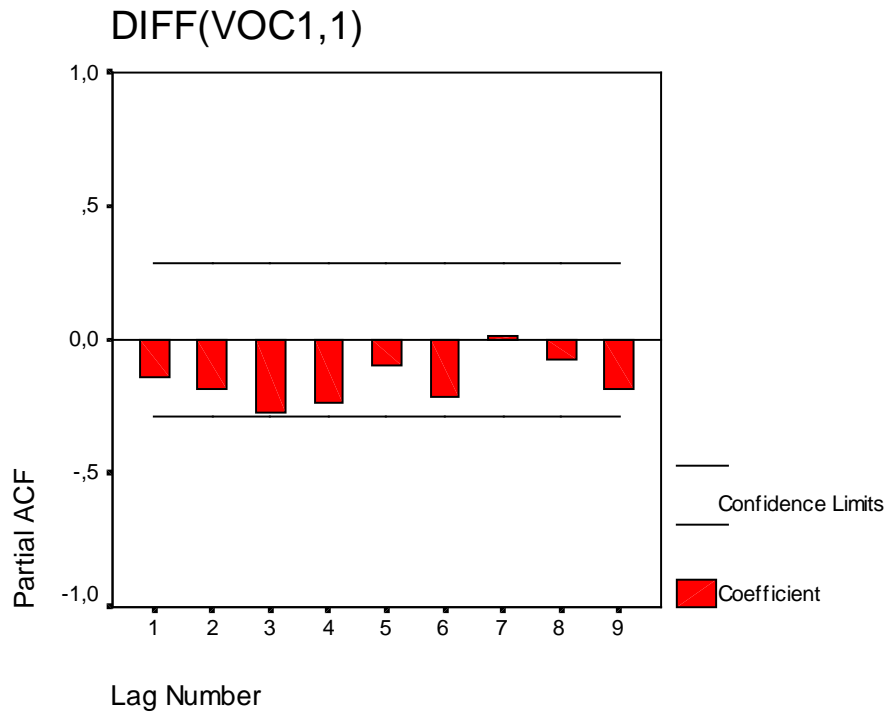
As an example we selected two graphs to illustrate the models we found.



The exponential decrease of the ACF (auto correlation function) and the significance of the correlation coefficient only, suggest a AR(1) model for the differenced AWP variable (abstract words) for the case N°7. The model was estimated and its adjustment studied.

For the variable VOC1 (baby vocalizing) in case N°7 the pattern suggests a random walk (RW) model. A normal residual test was performed to confirm the model.





This table shows the models found in each individual and each variable.

	Gal	Voc1	ToA1	ToB1	Hol1	Aff1	Prox1	Gal2	Voc2	ToA2	ToB2	Hol2	Aff2	Proz1	ETP	AWP	AW	HIP	HI	POSP	POS	NEGP	NEG	ET
1	RW	RW	RW	AR(1)	AR(1)	RW	RW	AR(1)	RW	RW	RW	AR(1)	RW	RW	RW	RW	AR(1)	RW	AR(1)	AR(1)	AR(1)	AR(1)	AR(1)	AR(1)
2	RW	RW	RW	RW	RW	RW	RW	RW	RW	RW	RW	RW	RW	RW	AR(1)	RW	AR(1)	AR(1)	AR(1)	AR(1)	AR(1)	AR(1)	AR(1)	AR(1)
3	RW	AR(1)	RW	RW	RW	AR(1)	AR(1)	AR(1)	AR(1)	AR(1)	AR(1)	AR(1)	AR(1)	RW	RW	AR(1)	AR(1)	AR(1)	AR(1)	AR(1)	AR(1)	AR(1)	AR(1)	RW
4	AR(1)	AR(1)	RW	RW	RW	AR(1)	RW	RW	AR(1)	RW	RW	RW	AR(1)	RW	AR(1)	AR(1)	AR(1)	AR(1)	AR(1)	AR(1)	AR(1)	AR(1)	AR(1)	AR(1)
5	AR(1)	RW	AR(1)	RW	RW	RW	AR(1)	RW	AR(1)	RW	RW	RW	RW	AR(1)	AR(1)	AR(1)	AR(1)	AR(1)	AR(1)	AR(1)	AR(1)	AR(1)	AR(1)	AR(1)
6	RW	AR(1)	RW	RW	RW	AR(1)	RW	AR(1)	RW	AR(1)	RW	AR(1)	AR(1)	RW	RW	RW	AR(1)	AR(1)	AR(1)	AR(1)	AR(1)	AR(1)	AR(1)	AR(1)
7	AR(1)	RW	RW	RW	RW	RW	RW	RW	RW	AR(1)	AR(1)	RW	RW	RW	RW	AR(1)	AR(1)	AR(1)	AR(1)	AR(1)	AR(1)	AR(1)	AR(1)	AR(1)
8	AR(1)	RW	AR(1)	AR(1)	AR(1)	MA(1)	RW	AR(1)	RW	RW	AR(1)	RW	AR(1)	RW	AR(1)	AR(1)	AR(1)	AR(1)	AR(1)	AR(1)	AR(1)	AR(1)	AR(1)	AR(1)
9	RW	RW	RW	RW	RW	RW	RW	RW	RW	RW	RW	AR(1)	RW	RW	RW	AR(1)	AR(1)	AR(1)	AR(1)	AR(1)	AR(1)	AR(1)	AR(1)	RW
10	RW	RW	RW	RW	RW	RW	RW	RW	RW	RW	RW	RW	RW	RW	AR(1)	AR(1)	AR(1)	AR(1)	AR(1)	AR(1)	AR(1)	AR(1)	AR(1)	AR(1)

We found that the verbal variables are mostly AR(1) models, while the non verbal variables are more random walk models.

5. Multivariate series to identify these models

The aim of the multivariate analysis is to find prediction models of each variables with the time series of the other variables.

For the identification of the causal variables, and the identification of the time in which they predict we did a cross lag correlation.

Then we estimated the models and studied their relations.

The Box & Jenkins method allows us to make causal inferences about the interaction of this mother-baby dyad in the psychotherapy sessions.

Case history

Tamara is 13 months old. She suffers asthma since she was 4 months old. She lives with her mother (18 years old) in a state institution for single mothers.

The mother rejected her pregnancy and maintained it secretly for 6 months. She had high pressure and *preclamsia* in the delivery. The contact with her own mother has been difficult: her mother is a prostitute and she was brought up in a nun's institution from the age of 12 to 18.

Psychotherapeutic process

The first interview with this mother was very difficult, she was concise and hermetic. When she started to tell us her history, Tamara showed scary eyes and cried, clinging to her mother's body. The rejection appears as a very important issue in this first session: rejection of the girl towards the therapist's invitations to play, and her constant negative attitude: "no, no".

In the last interview the girl comes full of initiative to take the toys and play and the mother does not stimulate her to develop these initiatives. When the girl manages to settle down a more important transferential bond with the therapist and begins to play, to explore toys (she plays with a doll), to exercise her body and to prove her corporal skills (to raise and to descend of the chair, to stand on the chair), the mother is seen more distant and receives with difficulties what the girl brings, and her inner world, and also what the therapist shows her through the interventions. The mother has difficulties accepting Tamara's emotional development, mainly when it's not a skin-to-skin relation. We see a mother who does not label nor clearly frames each of the emotional states of the girl.

Results

For this case the multivariate models we obtained were:

$GAZ1(t) = -0,65 \text{ PROX2}(t-3) - 0,71 \text{ PROX1}(t-1) + 0,63 \text{ PROX1}(t)$ **R2=0,45**

$VOC1(t) = 1,09 \text{ AFF2}(t) + 0,50 \text{ AFF1}(t-1) - 0,30 \text{ GAZ2}(t)$ **R2=0,36**

$TOA1(t) = 0,27 \text{ TOB2}(t) + 0,73 \text{ TOB1}(t) - 0,48 \text{ HOL2}(t) + 0,96 \text{ HOL1}(t-2) + 0,36 \text{ AFF1}(t-3)$ **R2=0,87**

$TOB1(t) = 0,39 \text{ TOB2}(t) + 0,14 \text{ TOA1}(t) - 2,81 \text{ ETP}(t-1)$ **R2=0,59**

$HOL1(t) = 0,57 \text{ HOL2}(t) + 4,42 \text{ ETP}(t)$ **R2=0,52**

$AFF1(t) = -0,41 \text{ HOL2}(t-1)$ **R2=0,23**

$PROX1(t) = 0,89 \text{ VOC2}(t) + 0,26 \text{ GAZ1}(t)$ **R2=0,54**

$GAZ2(t) = 1,33 \text{ PROX2}(t-2) + 1,17 \text{ AFF2}(t)$ **R2=0,29**

$VOC2(t) = -0,34 \text{ PROX1}(t-1) + 0,35 \text{ PROX1}(t) + 0,12 \text{ GAZ1}(t-1)$ **R2=0,75**

$HOL2(t) = 0,72 \text{ HOL1}(t) + 6,18 \text{ ETP}(t-1) - 0,19 \text{ TOA1}(t)$ **R2=0,67**

$TOA2(t) = 0,87 \text{ TOB2}(t) - 0,65 \text{ HOL2}(t) + 0,49 \text{ HOL1}(t-1)$ **R2=0,63**

$TOB2(t) = 0,9 \text{ TOB1}(t) + 0,62 \text{ TOB1}(t-1) + 0,18 \text{ TOA2}(t)$ **R2=0,81**

$AFF2(t) = 0,13 \text{ VOC1}(t) - 0,20 \text{ TOB2}(t)$ **R2=0,34**

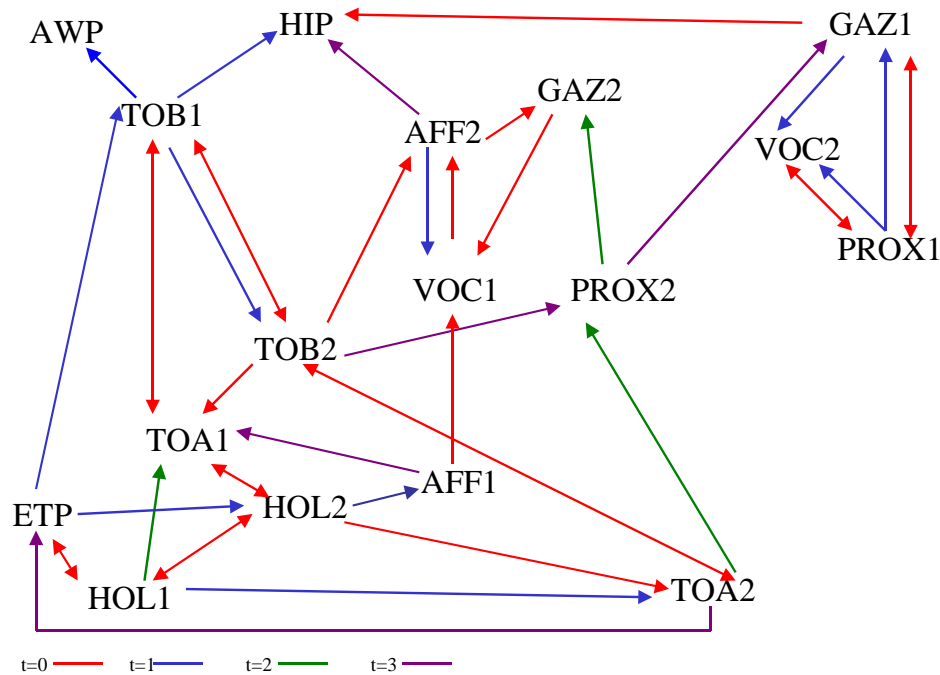
$PROX2(t) = -0,30 \text{ TOB2}(t-3) - 0,19 \text{ TOA2}(t-2)$ **R2=0,33**

$HIP(t) = -0,12 \text{ TOB1}(t-1) - 0,12 \text{ AFF2}(t-3) - 0,05 \text{ GAZ1}(t)$ **R2=0,37**

$ETP(t) = -0,01 \text{ TOA2}(t-3) + 0,02 \text{ HOL1}(t)$ **R2=0,30**

AWP=0,002 TOB1(t-1) **R2=0,11**

The relationships between variables can be observed in this diagram:



Hypothesis 1)

There is a cross-lagged relation between the verbal exchange as measured by the Cycles Model (Mergenthaler) and the Attachment indicators as measured by Massie-Campbell (non-verbal).

We observe that in this case verbal and non verbal variables correlate in a cross lagged way.

- TOB1 correlates ETP in lag t-1. R= -0,33
- HOL1 correlates with ETP in lag t. R= 0,33
- HOL2 correlates with ETP in lag t-1. R= 0,35
- HIP correlates with TOB1 in lag t-1, R= -0,40; with AFF2 in lag t-3, R= -0,32 and GAZ1 in a simultaneous lag. R= 0,33
- ETP correlates with TOA2 in lag t-1, R= -0,21; and with HOL1 in lag t, R= 0,33; AWP correlates with TOB1 in lag t-1. R= 0,33

The hypothesis is confirmed for case N.7.

Descriptive analysis

This micro analytic study allows us to observe the micro-affective interchange between the two partners (mother and baby) in the interaction in their “ways of being together”², (The Boston Change Process Study Group, 2002; Lyons-Ruth, 1998; Stern, et al, 1998; Tronick, Als, & Adamson, 1979) *We have investigated which variables produce which effect in each patient identifying a pattern of relationship for each dyad.* The relevance of the identification of these indicators is that we are getting through the gates that generate process of change in the psychotherapeutic process.

How does the baby respond to the mother's behaviour?

The baby responses:

- to mother's touching B and holding with touching A. $R^2=0.87$
- to mother's touching B and emotional tone with touching B. $R^2=0.59$
- to mother's vocalizing with proximity. $R^2=0.54$
- to mother's holding and emotional tone with holding. $R^2=0.52$
- to mother's proximity with gazing. $R^2=0.45$
- to mother's affect and gazing with vocalization. $R^2=0.36$
- to mother's holding with affect. $R^2=0.23$

The more the mother rejects skin to skin contact, the more Tamara tries to touch her; and the less the mother molds her body to her baby's in the holding, the more the baby looks for skin to skin contact with her mother to play or communicate with her.

When the mother rejects the skin to skin contact, the baby also does it. The less emotional tone of the mother, the more rejection of skin to skin contact from the baby.

If the mother vocalizes the baby tends to stay close to her.

If the mother molds her body to her baby's, the baby will match her rhythm in her mother's arms. An increase in the emotional tone of the mother also will make Tamara mold her body in her mother's arms.

When the mother is not close to her daughter, the baby will gaze more, while when the mother gazes less, but expresses more positive emotions, Tamara increases vocalization.

When the mother less matches her body and rhythm to her baby when she is on her arms, the baby expresses more positive affects.

In the baby's responses we can observe that Tamara is trying to activate her mother, looking for contact when she can't find it spontaneously. Tamara responds with synchrony to her mother's emotional tone, vocalization, holding and affect.

How does the mother respond to the child's behaviour?

The mother responses:

- to baby's touching B with touching B. $R^2=0.81$
- to baby's proximity and gazing with vocalization. $R^2=0.75$
- to baby's holding and touching A with holding. $R^2=0.67$
- to baby's holding with touching A. $R^2=0.63$
- to baby's touching B and gazing with referential activity. $R^2=0.37$
- to baby's vocalizations with expression of emotions. $R^2=0.34$

² Specific fittedness (Sander, 1977) is the on-going micro-analytic matching (fit) of affective expressions and relational moves of the infant and another. It is the “I do ‘x’, in relation to your ‘y’.” “I smile when you gurgle.” Furthermore, the implicit relational knowing of one relationship is unique to that relationship. “We do this together, and I don't do it with others.”

- to baby's holding with emotional tone. $R^2=0.30$
- to baby's touching B with abstract words. $R^2=0.11$

The more the baby rejects the mother's physical contact, the more the mother will reject her daughter's physical contact.

When the baby is not near the mother one lag before, the more the mother vocalizes, but the relation between proximity and vocalization is inverse in the same lag: the closer the baby is to her mother, more she vocalizes. The baby gazing also affects her vocalization: more gazing mean more vocalization of the mother.

When the baby molds her body to her mother's arms, the mother responds matching the infant's rhythm. When the baby initiates skin to skin contact with her mother, not for physical support but to play, groom or communicate, the mother's matching her body to her baby's decreases.

If the baby doesn't touch her mother, she will match her body to her daughter's in the holding.

When the baby less gazes the mother and less rejects her skin to skin contact, more referential activity the mother develops.

The baby vocalizations make the mother express more positive emotions, and the baby matching her body in the holding increases emotional tone in the mother's speech.

We identify in this mother's responses a communication with her daughter that is mediated through the holding and the skin to skin contact (rejected or looked for). These are mainly the baby behaviors that make her react. Baby's proximity, gazes and vocalizations also have some effect. The indicator that does not appear to make her react is the expression of emotions (affect) of her daughter.

The decrease of the rejection of the skin to skin contact of the baby (TOB1) is also one of the variables, together with baby's gazing, that predict the mother's referential activity, and the only indicator that predicts abstract words of the mother (although not significant).

Baby's matching her body to her mother's in the holding affects her emotional tone.

The relation between variables that appear reveal a synchronic (baby increases, she increases) response of the mother in the holding and when the baby rejects her skin to skin contact, but this response turns asynchronous when the baby looks for her physical contact, because her holding decreases, and inversely: when the baby rejects her, she tries to match her body to her baby's in the holding.

Baby's proximity and gazing seem to impact in the mother's vocalizations, while baby vocalizations makes her affect (expression of emotions) more positive.

Which variable produces change in the mothers mind?

- Gazing1 impacts on HIP in a simultaneous lag.
- TouchingB1 influences inversely HIP one lag before.
- Mothers affect impacts inversely on HIP three lags later.
- ETP is influenced inversely by Touching A2 three lags after.
- ETP influences and is influenced by Holding1 in a simultaneous lag.

What is interesting is that the referential activity of the mother (HIP) has no effects over the child's behaviour, but the child's behaviour (gazing, touching B) has some effect in the mothers referential activity.

When the child gazes less and less rejects her contact, more referential activity she has. This variables affect the way the mother is thinking. The mother does not have the capacity to process and to help to transform through actions what happens through mental activity, nor giving back to her daughter what she receives from her behaviour, for example Tamara’s gazes.

It seems that the referential activity is affected by the interaction with the child. Specially by touching and gazing, but it does not returns to the behavioural system.

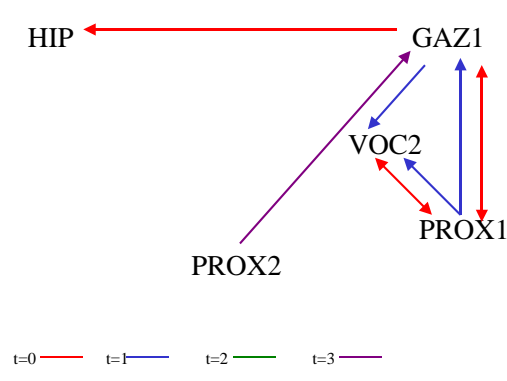
But when the mother becomes more emotional in her words (ETP), she affects one lag after, her own holding and simultaneously, her child’s holding. She becomes attuned with her child through the holding and touching. So when the mothers state of mind changes through the emotional words, this produce a effect (inverse) over the touching B (the baby rejects less her contact) and this also impacts the mothers referential activity.

The less the mother touches her daughter three lags before, and the better the position of the baby when the mother holds her, more emotional tone will be expressed in the mothers speech..

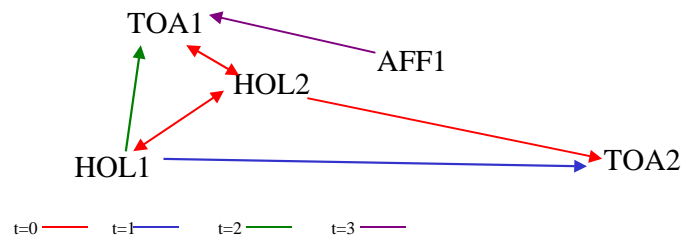
How the different relationships between verbal and non verbal variables take place between the dyad?

We have a **complex model of relationship between variables**. We could identify four subsystems of variables:

1) One subsystem appears between Proximity of the baby, that impacts one lag later in the vocalization of the mother, and simultaneously it affects and is affected by her vocalizations. Baby gazing is the other indicator that appears affecting mother vocalization one lag later. The gazing of the baby also impacts in the mother’s referential activity.



2) We have another system, of nonverbal interaction between holding of the mother, which has a reciprocal and of simultaneous interaction with touching A of the baby and with the holding of the baby. The affect of the baby three lags before will affect the baby the touching A.

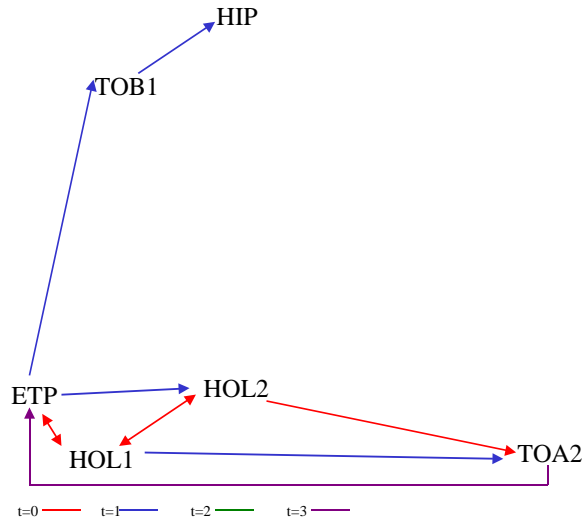


3) Another sub system of relationship between verbal and nonverbal variables is: the emotional tone of the mother simultaneously produces an effect in baby's holding. The baby's Holding produces two lags later effects in the mother's touching A, and simultaneously in the mother's holding, and one lag after in touching B of the baby.

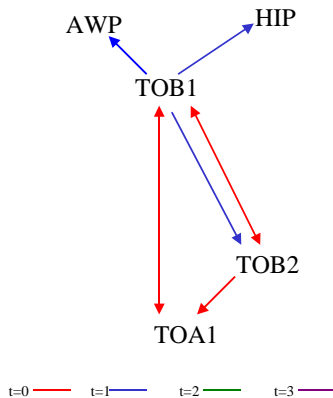
The emotional tone of the mother produces an effect on the baby: she rejects less the skin to skin contact with her mother, and this behaviour of the child impacts on the mothers referential activity.

But here, **the relationship between variables is ended, the referential activity has no effect in other variable.**

When the mother does not touch her daughter, and the baby shows a good position when the mother is holding her, more emotional tone will have the mothers speech, this means that her emotional schemata is activated. This emotional activation impacts on the child's behaviour, who rejects less the mothers physical contact, and when the mother feels less rejected on her physical contacts, her referential activity increases.



4) Touching B of the mother produces simultaneously an effect in the touching B of the baby. This variable also impacts in the same lag touching B of the mother, and one lag after the referential activity.



All the variables that involve physical contact have an active effect over the other verbal and the non verbal variables.

Two ways of relation between this dyad were observed: a very corporal way, where one could perceive a great pleasure of the mother, although that meant that the girl could not play nor be related to the therapist.

Which would be the intermediate steps (variables) so as the experiences of relation with the daughter could be mentalized by the mother, so that an experience could be represented and therefore mentalized?

One variable can hit another and give energy to another variable.

- The vocalizing of the baby impacts simultaneously on the mothers affect, her affect also impacts one lag after the baby vocalization.
- Mother's affect impacts on her referential activity. We can say that the mother can transform her affect in referential activity. (physical to words).
- The holding of the baby has a simultaneous correlation with the mother's holding and its motional words. Impacts one lag later the touching A of the mother, which as well impacts in the mother's holding.
- Emotional tone of the mother impact in touching B of the baby, which affects the referential activity one lag later. The more emotional words the mother express, less rejection of the contact on the part of the baby, and the less rejection, more referential activity.

Discussion

Our findings show us an interactional system between mother and baby (through the variables studied) in a psychotherapeutic process context.

From the interactive experience between mother and baby, representations are constituted. Finding out a mathematical model that describes the particular interaction of this mother infant pair we are observing the interaction underlying the fantasies established in the mother-baby bond. We can get closer to the subjective "experience of being with" through the clinical sessions.

These mathematical models could be compared to the "working models" (Bowlby, 1980) and also with the "models of being with" (Stern).

Another related concept is that of the "implicit relational knowings" developed by the Process of Change study group of Boston. In contrast to the more usual verbal, symbolic, or "semantic" mode, Lyons Ruth defines procedural or "implicit" relational knowing as "...rule-based representations of how to proceed, of how to do things with others. It begins to be represented long before the availability of language and continues to operate implicitly throughout life." (p.3). It operates out of awareness, outside of verbal consciousness and the dynamic unconscious." (Lyons-Ruth).

An interesting result of the complex model of interaction of this dyads we found out that the referential activity of the mother (HIP) has no effects over Tamara's behaviour, but baby's behaviour (gazing, touching B) has some effect in the mothers referential activity.

In the baby's responses we can observe that Tamara is trying to activate her mother, looking for contact when she can't find it spontaneously. AS we have pointed out, it's the child's behaviour that directly affects the mother's referential activity. The referential activity of the mother can be predicted in this case by baby's gazing and touching B, and by mother's affect. Tamara responds with synchrony to her mother's emotional tone, vocalization, holding and affect.

Comparing these results with our clinical approach we found out that this mother has a rejected self representation. She was abandoned by her parents when she was a child. In order to protect herself, she reacts in a distant and avoidant way.

But it is not enough to say that she rejects her daughter and keep distance of her, it is necessary to describe in concrete behavioral terms what the mother does to reject and to stay distanced from Tamara, so that the baby perceives it and has effects on her. The rejection can be translated into behaviors like: turning aside the glance, avoiding Tamara's physical contact. The distance can be translated in behaviors like selectively ignoring some of the infant's vocalizations or to be incapable to smile after the baby smiles.

We identify in this mother's responses a communication with her daughter that is mediated through the holding and the skin to skin contact (rejected or looked for). These are mainly the baby behaviors that make her react. Baby's proximity, gazes and vocalizations also have some effect. The indicator that does not appear to make her react is the expression of emotions (affect) of her daughter.

The decrease of the rejection of the skin to skin contact of the baby (TOB1) is also one of the variables, together with baby's gazing, that predict the mother's referential activity, and the only indicator that predicts abstract words of the mother (although not significant).

Is this a well functioning mother infant pair?

What happens in this dyad with the reciprocity, synchrony and contingency?

"... in Ainsworth's original conceptualisation of maternal sensitivity (Ainsworth et al., 1974), the emotional or hedonic tone might be described as a component of synchrony that –besides contingent temporal organization of the interaction—has a major impact upon the formation of representational structures. In further prompting this argument, it can be postulated that joint synchrony-reaching provides the essential mutual-fit experience that is necessary to derive social harmony and sharing-like states" (Lemche et al., 1999 p.7)

The synchrony can be operationally defined as a correlation between a variable of the baby and one of the mother that is mutual, in the same lag and with the same sign. For example between baby proximity and mother vocalizing, and touching B of the mother and touching B of the baby.

Reciprocity should be in the same indicator, but not necessarily in the same lag. E.g. between baby vocalizing and mother's affect.

A well functioning mother-infant pair has a mother that reacts in a strongly contingent way to the infants behaviour. What the mother does should have to be somehow related to what the baby does.

"Promptness of response towards infants with short latencies are typical response tendencies in maternal behaviour and have been viewed as optimal parental interactional qualities" (Ainsworth et al. 1974; Papoušek & Papoušek, 1992)

"...a total lack of contingency, or a strong bias in nonverbal and verbal communication might result in a disorganizing abstraction of perceptual and emotional features that, in the extreme, could result in defunct representational structures." (Lemche et al, 1999)

"Expectation and anticipation structures from contingency experiences in the early interaction systems can therefore be seen as foundations of verbally based interaction systems that tacitly and implicitly steer the dynamics of the interactants". (Lemche et al, 1999, p.6)

Although the mother reacts to Tamara's behaviour, she seems to have an avoidant contact while the baby does not seem to have it. The less the baby gazes her mother, the more referential activity she develops. The less the baby rejects the physical contact of her mother, the more referential activity she has. When the daughter does not gaze her mother, she develops more referential activity.

These results correspond with what is clinically unfolded in the session, where the mother was not able, for example, to help to process in the girl different levels of organization of her play.

The sensitive responsiveness of the parent is traditionally regarded as the most important determinant of attachment security in the infant. The parameters of sensitive responsiveness include: prompt responsiveness to distress, moderate stimulation, interactional synchrony, non-intrusiveness, warmth, involvement and responsiveness, as defined by R. Emde.

This results contribute to examine early relationships in order to understand which communicational patterns are well functioning ones and which are not. In a next step we will search for a clinical judgement to contrast with the overall attachment measure (Massie-Campbell).

Limitations

- The results are restricted to a single case.
- The findings correspond to a brief psychotherapeutic process and the pattern of relationship found is specific for this context.

Hypotheses 2, 3, 4, 5.

Overview of work accomplished to date (including publications and presentations)

These hypotheses of the research plan are not fully completed to date.

During this period different adjustments of the Cornell Play Therapy Instrument (Kernberg-Normandin) were needed. We found difficulties for its application in infants aged 6-24 months and an adaptation has been done, with several discussion meetings with P. Kernberg and L. Normandin to precise our concepts.

As this instrument segments the sessions in minutes and seconds and the segmentation we are working with is based in blocks of 150 words we are trying to find a way to make attachment (Massie-Campbell) and linguistic measures comparable with the scores of the CPTI.

Nevertheless we could accomplish descriptive studies that showed us changes in the affect expressed between the first and last session.

The Core Conflictual Relationship Theme (Luborsky) was applied in one case and no relevant results were found.

During this period various reports were presented in the International Psychoanalytical Conferences and in the Society for Psychotherapy Research Meetings.

c) Publications

Jeu et regulation affective. Altmann, M. In Revue Spirale. Jue bébé jue. Decembre 2002. In press

Cantos, ritmos y sincronías en la relación madre- bebé, Altmann, M. et al. Revista Latinoamericana de Psicomotricidad, N°1, www.iberopsicomot.net, 2000.

Lo cotidiano en la vida de los bebés. Altmann, M. et al. In Publicación del 4° Encuentro nacional de Educadores del INAME. Las prácticas educativo-sociales con niños, niñas y adolescentes en la vida cotidiana. UNICEF- INAME, 2001, pp.95-109.

d) Presentations at Congresses, Meetings, Seminars, etc.

“Observando la conducta de los bebés” Post-grade Seminar at Universidad Católica del Uruguay, July 2002.

“Estudio microanalítico sobre juego y apego”, Congress of the Society for Psychotherapy Research, Reñaca, Chile, August 2002

“Nuevos desarrollos sobre el vínculo temprano. El Apego.” Seminar at Universidad del Desarrollo, Santiago, Chile, August 2002

“Estudio microanalítico sobre juego y regulación afectiva”, III Research Congress/XXIV FEPAL Congress, Montevideo, Uruguay, September, 2002

Tasks outstanding to accomplish objectives.

This paper will report the work done to accomplish hypotheses 2, 3, 4 and 5

Hypothesis 2)

Verbal interventions of the therapist that include the three components of the Core Conflictual Relationship Theme (Luborsky) –wish, response of the others, response of the subject- can change the emotional tone from negative to positive.(Therapeutic Cycles Model, Mergenthaler))

Hypothesis 3)

Verbal interventions of the therapist that include the three components of the Core Conflictual Relationship Theme (Luborsky) –wish, response of the others, response of the subject- can improve the quality of the interaction as measured by Massie Campbell. Scale.

Study of the **Therapist's Verbal interventions.**

Lester Luborsky's Core Conflictual Relationship Theme (1995)

To test hypothesis 2-3 we did an exploratory study with the Lester Luborsky's Core Conflictual Relationship Theme (1995) trying to identify the presence of the 3 repeated emerging components: the wish, the response of the object and the response from the subject in one patient: N°7

In the first session we found no interventions containing the 3 components of the CCRT (we think this is expectable because it is a new situation for the mother and the infant). In the last session we found only one intervention with the 3 components.

These findings showed us no relation from a descriptive perspective, because the positive and negative emotions were modified several times during the session.

An interesting finding is that the same relational pattern that we saw between mother and baby is repeated between therapist and baby: desire to help others, object reaction disrupts, annoy and the subject reacts with fear and shame.

This type of treatment has a huge amount of interventions that were not considered in the CCRT, so hundreds of episodes are disregarded with this type of patient.

Regarding these findings we decided to discharge the CCRT in this study.

Interventions must take into account which are the channels that are privileged in each dyad relationship: speech, gazing, touching, etc. or if the interventions point out the meaning of the speech.

Hypothesis 4)

The moments of play (Cornell Play Therapy Scales, Kernberg P, M. et al.) produce changes in the attachment scores as measured by Massie Campbell.

Hypothesis 5)

The moments of play (Cornell Play Therapy Scales Kernberg P, M.D. et al.) produce changes in the emotional tone in the mother-therapist speech (Therapeutic Cycles Model Mergenthaler)

Study of non verbal indicators in first and last sessions (based on 150 block segmentation).

Interventions referring non verbal aspects will be described as :

1.- Study of the Play

For this variable we will use the following scales of the Cornell Play Therapy Scales (Kernberg P, M.D. Saralea Chazan, Ph. D. & Lina Normandin, PH.D Version 37.

- a.- Segmentation of play activity
- b.- Dimensional analysis of the play activity segment
 - b.1- descriptive analysis
 - b.2- structural analysis: affective and dynamic components.

2.- Study of the non verbal indicators according to Massie-Campbell Scale. An overall measure of the infant and mother attachment indicators will be averaged per block. Good attachment scores for mother and baby in the same block will show the capacity of the dyad to interact properly.

To test this hypothesis the following studies were performed up to date:

- a) Definition of Play activity from 6-18 months
- b) Reliability analysis

As part of the procedure we decided to study the non verbal determinant indicators in each individual before correlating the variables with the CPTI.

a) Definition of Play activity from 6-18 months

We consider Play activity in the developmental phase we are studying (6-18 months) when two or more of the characteristics named by Paulina Kernberg are observed.

- 1) an expression of intent (eg. Gaze with interest), a vital attitude expressed in the expression of his gaze and different sensory channels
- 2) actions indicating initiative, such as trying to reach an object, searching
- 3) An expression of specific positive or negative affects such as glee, delight, pleasure, surprise, anxiety or fear
- 4) Focused concentration with toy or person (may be in response to therapist's activities)
- 5) Purposeful use of toys, objects, own body, therapists or parents body or physical surround

The capacity to maintain the play with attention, pleasure, interest and curiosity defines a "creative" play in the infant.

In the first stages of development the play activity is related to functions such as feeding, sleeping, bath, etc.

b) Reliability analysis

1. Segmentation of play activity

After the training period 8 vignettes were selected for the reliability analysis:

	Therapist Experience	Patient	Age (months)	Diagnosis	Session	Begin	End	Duration
1	+ 30 years	8	8	Feeding problems	1°	0:08:11	0:22:43	0:14:32
2	+ 15 years	2	6	Asthma	3°	0:13:45	0:21:25	0:07:40
3	+ 30 years	5	14	Asthma	3°	0:04:47	0:11:40	0:06:53
5	+ 10 years	4	18	Asthma	3 ^a	0:24:21	0:31:36	0:07:15
6	+ 30 years	7	14	Asthma	3°	0:00:00	0:17:50	0:17:50
7	+ 20 years	10	6	Asthma	3°	0:00:58	0:17:40	0:16:42
8	+ 30 years	6	11	Asthma	1°	0:39:37	0:54:18	0:14:41

6 raters segmented the vignettes and classified the infants activity, identifying the Play Activity segments (artículo de Kernberg sobre confiabilidad)

Results of reliability analysis- Kappa interjudges agreement: mean (0,59), range (0,20-1,0)

We found one of the judges (n°6) had low agreements and eliminate it, resulting an average agreement of: 0,78, range: 0,25-1,00)

2. Dimensional analysis

After the segmentation is done, the raters reach a consensual segmentation and start the dimensional analysis of the Play Activity segments found in the 8 vignettes.

We will use part of the test, focusing on Affective components of the Play Activity, that contains three subscales: affective tone, affects expressed by the child while playing and therapist's affective tone expressed towards the child.

This phase is still in process

BIBLIOGRAPHY

- Altmann de Litvan, M. "Correlato entre el bebé observado e inferido". Revista Uruguaya de Psicoanálisis. Montevideo, Uruguay, 1997.
- Altmann de Litvan, M. et al "La Vida Cotidiana de los Bebes" Publicación en prensa Unicef y Centro de Educadores del INAME, Montevideo, Uruguay, 2000
- Altmann de Litvan, M. et al "Arrullos, Ritmos y Sincronías en el Vínculo Madre-Bebe" Revista Latinoamericana de Psicomotricidad " Montevideo, Uruguay, 2000
- Altmann & Gril "Los duelos. Sus efectos en el apego y la narrativa" Publicación Asociación Psicoanalítica del Uruguay"2000 (May)
- Altmann & Gril "Investigación del Proceso Terapéutico en Interacción Temprana". Revista Uruguaya de Psicoanálisis No 91 Publicación Asociación Psicoanalítica del Uruguay". – June 2000
- Altmann, Gril "Walking, Multiple Methods and Multiple Interventions". (inédito) September 2000
- Box, George & Jenkins, Gwilym: Time Series Analysis. Forecasting and control. Holden Day Oakland 1976.
- Brazelton, B. & Cramer, B., "The earliest relationship", Parents, Infants and the Drama of Early Attachment, Karnac Books, 1991.
- Bucci, W., "Components of the multiple code theory". Psychoanalysis & Cognitive Science", The Guilford Press, New York, 1997.
- Emde, Robert: "The Wonder of Our Complex Enterprise: Steps Enabled by Attachment and Effect of Relationships on Relationships". In: *Infant Mental Health Journal*. Vol. 12, No. 3, Fall 1991.
- Fonagy, P.: "Attachment Theory and Psychoanalysis", Other Press, Now York, 2001
- Fonagy, P., Gergely, G., Jurist, E and Target, M. (2002) Affect regulation, Mentalization and the Development of the self, Other press, New York.
- Fonagy, P.: "Moments of change in psychoanalytic theory: Discussion of a new theory of psychic change. *Infant Mental Health Journal*, 19, 163-171, 1998.
- Goldberg, S. & Muir, R. & Kerr, J., "The developmental perspectives of attachment and psychoanalytic theory, "The attachment theory" The Analytic Press, 1995.
- Hofer, Myron: *Hidden Regulators*. In Attachment Theory. Ed. Goldberg, Muir y Kerr, New York, The Analytic Press, 1995.
- Klein, Melanie, Algunas conclusiones teóricas sobre la vida emocional del bebé. (1952). *Desarrollos en Psicoanálisis*. Ed. Hormé, Buenos Aires, 1967.
- Lemche, E.; Grote, K.; Orthmann, C.; Ari, A.; Lennertz, I.; Haefker, J., Klann-Delius, G. (1999) Early parent-child interaction, parental representations, and emotion-regulatory patterns as measured through evoked play-narrative: results from an exploratory study of 16 preschool children. Paper presented at the 41st International Research Meeting, Universidad Católica de Chile.

Lecours, S. & Bouchard, M., "Dimensions of Mentalisation: Outlining levels of Psychic transformation", *International Journal of Psycho-Analysis*, 1997, Vol. 78, 855.

Leuzinger-Bohleber, M, Schneider, H. and Pfeifer, E (Eds.) (1992) *Two butterflies on my head...* Springer-Verlag, Germany.

Lutkepohl, Helmut: *Introduction to multiple time series analysis*. Springer Verlag Berlin 1993.

Main, M., "Recent Studies in Attachment, Attachment Theory". Ed. Goldberg, Muir y Kerr, New York, 1997.

Massie, Henry; Campbell, Kay: *The Massie-Campbell Scale of Mother-Infant Attachment Indicators During Stress (AIDS Scale)*, Basic Books, New York, 1983.

Moran, G. and Fonagy, P. (1993) "Psychoanalysis and Diabetic control: A single case study" *British Journal of Medical Psychology* 1987, 60: 357-372.

Stern, Daniel: "The Interpersonal World of the Infant" Basic Books, Inc. Publishers/New York, 1985

Stern, Daniel: "Putting time back into our considerations of Infant Experiences: A Microdiachronic View" *Infant Mental Health Journal*, Vol 21, Jan-April 2000-Number 1-2

Stern, Daniel: "La constelación de la maternidad" Paidós, 1997

Tronick, E. (Special Issue Ed.) Lyons-Ruth, K; Stern, D.; Sander, L.; Beebe, B.; Fonagy, P. et al. (1998) *Infant Mental Health Journal* Vol.19, N°3.

Tronick, E. (2002) *The increasing Differentiation and Non transferability of Ways of Being Together*. Paper presented at the conference: Current developments in research, theory and Application. The Center for Attachment Studies of the Derner institute of Advanced Psychological Studies at Adelphi University, Morris Eagle, Chair.

Uriel, Ezequiel: *Análisis de series temporales. Modelos ARIMA*. Paraninfo, Madrid, 1985