THE MONTEVIDEO STUDY OF VERBAL AND NON VERBAL INTERACTION

Marina Altmann de Litvan, Sylvia Gril, Mario Luzardo, Analia Corti, Gabriela Nogueira, Alicia Weigensberg, Emilia Sasson, Elena Gonzalez, Maria Bauer, Rosina Procopio & Laura Szteren

Summary

Aims

Based on a psychoanalytic model, we developed empirical research in the field of brief mother-baby psychotherapy. The investigation is carried out at two different levels; one is the attachment regulation in the mother-baby dyad (non verbal interaction) and the other one is narrative analysis of the verbatim sessions using indicators that allow study of the capacity of the therapeutic dyad, mother and therapist to reflect upon emotions based on the combination of emotion and abstraction patterns.

Within the highly complex pre-verbal interaction between mother and child, we usually disregard hundreds of thousands of episodes. The mother daily performs a multiplicity of operations having no awareness of their importance for the construction of the baby's self.

The use of empirical methodology to study in a microanalytic level this interaction and also the therapeutic discourse will give us different information that can complement and enrich the clinical view.

Methods

Sample

Ten mother-baby dyads have been selected at random from the regular treatment program at the Pediatric University Hospital in Montevideo. The babies were aged from 3 to 18 months and showed psycho-functional disorders. The mothers were offered to participate in a research program including psychotherapeutic interviews. Their consent to participate in this project is verbally granted and involves two different stages. In the first instance, a medical doctor asks the mother whether she wishes to take part in a research program designed to study the relationship between the disease process and the mother baby relationship. If the mother agrees, she receives clear information of the goals of the study during the course of the first psychotherapeutic interview. The mother is also told that the interviews will be recorded and the videotapes will be exclusively allocated to scientific research purposes and are subject to strict confidentiality.

After the initial medical consultation each of the dyads received from 3 to 4 sessions lasting approximately one hour. The interviews were fully videotaped (Altmann et. al) and transcribed according to the transcription standards for the Spanish language (Mergenthaler & Gril 1996).

Procedure

1. The analysis of the text material is done using the Cycles Model Program CM (available from the Ulm Textbank Web site). This program takes as an input the psychotherapy transcript and provides as an output - besides various data files - a graphical representation of the session based on a 150-word

block segmentation showing the flow of Emotion-Abstraction Patterns and the embedded narratives for patient language alone and for the speech of both participants. Additionally the speech proportion is graphically shown. We will take the graph that shows the speech of both participants, therapist and patient as a whole.

2. Rating of the attachment indicators according to Massie-Campbell's Scale following the word block segmentation. (See Component study 1)

Results

The main results of this project showed that these brief interventions had an impact in the attachment indicators from the first to the last session of each treatment in our sample of ten cases (20 sessions). The fact that in the first interview the mother is establishing the relationship with the therapist can make an impact in the attachment indicators because she could be more focused in the relationship with the therapist than in the interaction with the baby. Nevertheless, as we have 7 variables to study the non verbal interaction, if the mother is not looking at the baby, the interaction can be established through other non verbal channels.

These results are close to the findings of studies carried out by Van Ijzendoorn and colleagues (1995) which showed that short term focussed interventions in the attachment relationship between parent and child can be more effective in achieving prevention than long-term unfocussed ones.

There are also ongoing projects studying the modification of the attachment classifications with high-risk samples. Peter Fonagy (1998) Erickson´s STEEP (Steps Toward Effective, Enjoyable Parenting) (1996; Erickson, Korfmacher & Egeland, 1992) in Minnesota and Christoph Heinicke´s Home visiting program at UCLA (Heinicke, Fineman et. al., 1999; Heinicke, Goorsky et. al., 1998).

We depart from a conception that overestimated the role of the narrative and the connecting patterns as privileged moments in the verbal interaction (insight). The results show that there were no significant correlations for verbal and non verbal measures. At the beginning of the project we believed that the productive moments of the speech in terms of insight were also rich moments of non-verbal interaction between the mother and the baby.

This study includes five component studies:

Component study 1: Comparing verbal exchange of mother and analyst and non-verbal interaction of mother and babies with psychofunctional problems. An exploratory study based on the components of the Cycles Model (Mergenthaler-Bucci) and the Infant's Attachment Indicators (Massie-Campbell Scale) (1998-2000)

Component study 2: Effectiveness of brief psychotherapeutic mother-baby interventions (1998-2000)

Component study 3: Strengthening bonds in baby-caregiver dyads. Interventions in early stages of development (2004)

Component study 4: Non-verbal interaction through play and affect regulation (2001)

Component study 5: Models of mother-baby interaction (verbal and non-verbal) in the psychotherapeutic process. Micro analytic study with the application of a mathematical method (Box-Jenkins). (2003-2004)

References

Erickson, M. F., Korfmacher, J., & Egeland, B. (1992). Attachments past and present: Implications for therapeutic intervention with mother-infant dyads. Development and Psychopathology, 4(4), 495-507

Fonagy, P. (1998). Prevention, the appropriate target for infant psychotherapy. Infant Mental Health Journal, 19, 124-150.

Heinicke, C. M., Fineman, N. R., Ruth, G., Recchia, S. L., Giuthrie, D., & Rodning, C. (1999). Relationship-based intervention with at-risk mothers: Outcome in the first year of life. Infant Mental Health Journal, 20, 349-374.

Heinicke, C. M., Goorsky, M., Moscov, S., Dudley, K., Gordon, J., & Guthrie, D. (1998). Partner support as a mediator of intervention outcome. Am J Orthopsychiatry, 68(4), 534-541.

Mergenthaler, E. & Gril, S. (1996) Descripción de las reglas para la trascripción de sesiones de psicoterapia. Revista Argentina de Clínica Psicológica, 5(2), 163-176.

van IJzendoorn, M. H., Juffer, F., & Duyvesteyn, M. G. C. (1995). Breaking the intergenerational cycle of insecure attachment: A review of the effects of attachment-based interventions on maternal sensitivity and infant security. Journal of Child Psychology and Psychiatry, 36, 225-248.

Implications for psychoanalysis

We departed from a conception that overestimated the role of the narrative and the connecting patterns as privileged moments in the verbal interaction (insight).

Words are the medium of psychoanalytic treatment, but the changes that are sought in treatment involve perception, emotion, somatic systems, and action - how we perceive the world, what we feel, what we do, not only, or not even primarily what we say.

The results showed us that there were no significant correlations for verbal and non verbal measures. At the beginning of the project we also believed that the productive moments of the speech in terms of insight were also rich moments of non verbal interaction between the mother and the baby.

Our conclusions about two different information processing modalities, the verbal processing through the speech in the session, and the non verbal interaction between the mother and the baby as another way of processing information are consistent with Wilma Bucci´s Multiple Code Theory. We consider that these findings are relevant for psychoanalytic theory because they show the presence of two independent and different ways of processing information, both of them contributing to the outcome of the treatment. These two levels are continuously affecting each other: the struggle to symbolise the non-verbal level can be seen as one of the major goals of psychoanalysis (Bucci, 1985, 1997), and the nature of the symbolisation can then potentially affect the non-verbal level. Beebe & Lachmann (1988, 1997) have referred to the perception-action level in infancy as a sensory-motor form of "presymbolic representation". We distinguish between a symbolic representational level (discrete, categorical, declarative) and a perception-action level (nonsymbolic, continuous, implicit, procedural) in the organisation

Wilma Bucci states that "Cognitive scientists study mental events as hypothetical constructs inferred from observable behaviour, rather than as subjective experience. The inner experiences of other people, conscious and unconscious, are intrinsically unobservable events, which require some sort of theoretical network to be understood. Subsymbolic processing is understood scientifically through complex mathematical models (Rumelhart, 1989), but is experientially immediate and familiar to us in the actions and decisions of everyday life" (Bucci, 2001)

We tried to integrate these two approaches in this research by showing non-verbal and verbal interaction through both: the mathematical model which was obtained departing from the observable behavior and the psychotherapeutic session. The interactive experiences between mother and baby constitute the building blocks of mental representation. (Stern, 1995) Our findings show us their interactional pattern (through the variables studied) in a specific psychotherapeutic process context.

This study constitutes an attempt to approach the organizational rules of the non verbal and verbal systems in this mother-infant interaction. This allows us to be aware of certain sides of the relationship that we cannot observe in the clinical session.

References

Beebe, B. & Lachmann, F. (1988) The contribution of mother-infant mutual influence to the origins of self-and -object-representations. Psychoanalytic Psychology, 5 (4), 305-337.

Beebe, B., Lachmann. F. and Jaffe, J. (1997) Mother-infant interaction structures and presymbolic self and object representations. Psychoanalytic dialogues, 7, 113-182.

Bucci, W. (1985). Dual coding: A cognitive model for psychoanalytic research. Journal of the American Psychoanalytic Association, 33, 571-607.

Bucci, W. (1997). Psychoanalysis and Cognitive Science: A Multiple Code Theory. New York: Guilford Press.

Bucci, W. (2001) Pathways of emotional communication. Psychoanalytic Inquiry, 20, 40-70 5.

Rumelhart, D. & McClelland, J. (1986) [and PDP Research Group] Parallel Distributed Processing, Col 1 Cambridge, MA: MIT Press

Stern, D. (1995) The motherhood constellation. A unified view of parent-infant psychotherapy. Basic Books, Harper Collins Publishers, New York

Keywords

Attachment, early intervention, infancy, interactional patterns, maternal attachment, mother-baby interaction, Multiple Code Theory, narrative analysis, non-verbal interaction, prevention, Therapeutic Cycles Model, verbal interaction

Bibliography

Altmann, M. (2001-2). Verbal and non-verbal indicators in psychotherapies with mothers and babies (IPA Award July 2001). Paper presented at the 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 Diaz Roselló); and the Asociación Psicoanalítica Chilena (Agosto, 2002).

Altmann, M. (2002). Estudio microanalítico sobre juego y apego. Paper presented at the Congress of the Society for Psychotherpy Research, Reñaca, Chile.

Altmann, M. (2002). Estudio microanalítico sobre juego y regulación afectiva. Paper presented at the III Research Congress/XXIV FEPAL Congress, Montevideo, Uruguay.

Altmann, M. (2002). Jeu et regulation affective. In Revue Spirale. Jue bebé jue. Decembre 2002.

Altmann, M. (2002). Nuevos desarrollos sobre el vínculo temprano. El Apego. Paper presented at the Seminar at Universidad del Desarrollo, Santiago, Chile.

Altmann, M. (2002). Observando la conducta de los bebés. Paper presented at the Post-grade Seminar at Universidad Católica del Uruguay.

Altmann, M. (2003). Intervenciones terapéuticas durante el primer año de vida. Aplicación de la investigación en infantes a la psicoterapia de las interacciones tempranas. Estrategias y alcances. Paper presented at the Postgraduate seminar at the Facultad de Psicología, Universidad de Buenos Aires, Argentina.

Altmann, M. (in press). Intervenciones psicoterapéuticas. Aportes desde la investigación y la clínica.

Altmann, M., & al. (2000). Cantos, ritmos y sincronías en la relación madre- bebé. Revista Latinoamericana de Psicomotricidad, Nº1, www.iberopsicomot.net.

Altmann, M., & al. (2001). Lo cotidiano en la vida de los bebés. 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 (pp. 95-109).

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

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

Altmann, M., Angulo, B., Brovetto, E., Nogueira, G., Perkal, A., Próspero, S., et al. (2000). Acerca del vínculo no verbal entre la madre y su bebé. In Investigación en psicoterapia. Procesos y resultados. Investigaciones empíricas 1998. SPR. Capítulo Sudamericano (pp. 169-188).

Altmann, M., González, E., Nogueira, G., Perkal, A., Bauer, M., Sasson, E., et al. (2003). Estudio microanalítico sobre la regulación afectiva a través del juego y algunos indicadores de la interacción madre-bebé. Análisis descriptivo. Discussant: Dr. Miguel Hoffmann, Asociación de Psiquiatría y Psicopatología de la Infancia y la Adolescencia, Montevideo, Uruguay.

Altmann, M., & Gril, S. (1999). Presentation of research project on narrative and attachment. Paper presented at the International Pre-conference of Research on Psychoanalysis, Santiago de Chile.

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

Altmann, M., & Gril, S. (2000). Research project on narrative and attachment. Paper presented at the Fellows Research Meeting, International Psychoanalytic Association, London.

Altmann, M., & Gril, S. (2000). Walking, multiple methods and multiple interventions (discussant: Robert Emde). Paper presented at the 7e Congrès Association mondiale de santé mentale du nourrisson, Montreal.

Altmann, M., Gril, S., & al. (2001). La relación entre el intercambio verbal de la madre con el analista y la interacción no verbal de la madre con su bebé. 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).

Altmann, M., & Luzardo, M. (2003). Microanalytic study of relationship patterns in psychotherapeutic process using verbal and non-verbal indicators. Single Case study. Paper presented at the Joseph Sandler Research Conference, London.

Altmann, M., & Luzardo, M. (2004). Trabajando en las fronteras de la clínica y la investigación empírica. Patrones de interacción Verbales y No verbales. Paper presented at the Panel: "Intergenerational transmission of psychopathology" at the 43rd Congress of the International Psychoanalytic Association.

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

Gril, S., Altmann, M., & Mergenthaler, E. (2000). Del lenguaje a la conducta. In Investigación en psicoterapia. Procesos y resultados. Investigaciones empíricas 1998. SPR. Capítulo Sudamericano (pp. 227-245).

Gril, S., Altmann, M., & Mergenthaler, E. (2000). Micro-analytic study of the psychotherapeutic process based on narratives and attachment. Paper presented at the 31st Annual Meeting of the Society for Psychotherapy Research, Chicago, Illinois.

Lepper, G., Gril, S., Altmann, M., & Mergenthaler, E. (2000). Towards a Pragmatics of Psychotherapy. Paper presented at the Meeting of the Society for Psychotherapy Research, University of Kent.

COMPONENT STUDY 1: COMPARING VERBAL EXCHANGE OF MOTHER AND ANALYST AND NON-VERBAL INTERACTION OF MOTHER AND BABIES WITH PSYCHOFUNCTIONAL PROBLEMS. AN EXPLORATORY STUDY BASED ON THE COMPONENTS OF THE CYCLES MODEL (MERGENTHALER-BUCCI) AND THE INFANT'S ATTACHMENT INDICATORS (MASSIE-CAMPBELL SCALE) (1998-2000)

Aims

In this project we aimed to prove the following hypothesis:
There are significant correlations for the verbal indicators in the mother and therapist's speech and non verbal attachment indicators in mother- baby interaction. We expected to find correlation for the verbal system and the non-verbal system.

Methods

The sample consisted of 10 mother-baby dyads. We looked at the first and last sessions of a brief psychotherapeutic intervention (3-4 sessions). 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, 2000).

To measure the verbal indicators we used the Cycles Model (Mergenthaler-Bucci) (See Component 1.1 for more information about this model). Non-verbal indicators were assessed with the Massie-Campbell Attachment During Stress Scale (See Component 1.2 for more information about this scale) The sessions were fully videotaped and segmented in blocks of 150 words according to the Cycles Model.

Results

All linguistic and non verbal variables were correlated in a block by block basis (click here for more information) No significant correlation was found for the verbal measures in the mother and therapist's speech and the attachment indicators in the mother-baby dyad (Pearson correlation).

Conclusions

We moved away from a conception that overestimated the role of the narrative and the connecting patterns as privileged moments in the verbal interaction (insight). The results show that there were no significant correlations for verbal and non verbal measures. At the beginning of the project we believed that the productive moments of the speech in terms of insight were also rich moments of non verbal interaction between the mother and the baby. Our findings about two different information processing modalities, the verbal processing through the speech in the session, and the non verbal interaction between the mother and the baby as another way of processing information are consistent with Wilma Bucci´s Multiple Code Theory. The Multiple Code Theory incorporates representations and processes in all sensory modalities as well as motoric and visceral information as contributing to the human information-processing system. The psychological meaning of an external event, a verbal or perceptual stimulus is defined by the total set of modality specific verbal and non verbal reactions that it typically evokes. These may include word associations, images of objects, non verbal motor reactions and affective reactions. Our findings have practical implications for the implementation of therapeutic strategies with populations under severe psychosocial risk. Practice-oriented research is necessary in Uruguay; these findings can help to provide health care at low cost. Brief and effective therapeutic interventions should be implemented (at this moment we are developing a manual to guide these type of interventions). We are aware of the limited size of our sample in order to build general guidelines. Nevertheless, according to the findings we have, we can suggest some ideas for the work with dyads with the same characteristics of those belonging to our sample. According to these results it seems to be important to stimulate the mother to develop non verbal communications with the baby, especially through gazing, touching and vocalising. We also found that the use of an abstract language is not helpful for the attachment relationship. The narratives and the reflective processes that took place in the verbal exchange were of help for the attachment bond as all cases besides one had at least one session considered as productive according to the "quality of cycles" criteria. Future research is needed to determine the extend to which these results can be generalised, in order to integrate the findings in a design of a training program that would enable the mothers profit from their own natural resources to understand and relate to their babies.

References

Altmann, M. et al (1993) Intervenciones reestablecedoras del equilibrio psicosomático con patologías de alto riesgo. Un caso de asma de lactante. Primeras Jornadas Nacionales de Interacción Temprana. Ed. Roca Viva, Montevideo, Uruguay.
Altmann, M. (2004) Intervenciones psicoterapéuticas. Aportes desde la investigación y la clínica. In press.

[Return to the overall summary of this research program](#)

COMPONENT 1.1

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, 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 & Bucci, 1999, p. 339)

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

References

Bucci, W. (1997). Psychoanalysis and cognitive science: A multiple code theory. New York: Guilford Press
Mergenthaler, E & Bucci, W. (1999) Linking verbal and non-verbal representations: Computer analysis of referential activity. British Journal of Medical Psychology, 72, 339-354

COMPONENT 1.2: 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 infant's 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.

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

Reference

Massie, H. & Campbell, K.. (1983) The Massie-Campbell Scale of Mother Infant Attachment Indicators During Stress. In J. Call, E. Galenson, & R. Tyson (Eds.) Frontiers of Infant Psychiatry. New York: Basic Books, Inc.

COMPONENT STUDY 2: EFFECTIVENESS OF BRIEF PSYCHOTHERAPEUTIC MOTHER-BABY INTERVENTIONS (1998-2000)

Aims

The study tested the following hypotheses:
- The psychoanalytically oriented psychotherapeutic interview has an effect in the attachment indicators. Encouraging the mother to recall a narrative that integrates the baby's initiatives, gestures improve the attachment and the quality of the interaction.
- The subjects change from the extreme points (insecure, avoidant, over anxious) towards the middle range (secure attachment) if the attachment regulation gests better as an effect of the therapeutic meetings.

As Massie & Campbell (1983, p. 19) state,"...This scale is not designed to produce a single correct score. Ratings at 1, 2 or 5 of 2 or more behaviours on successive visits (2 or more) suggest the need for a diagnostic evaluation of parents and infants ... Serially observed aberrant interaction warns that the child may be at developmental risk."

Methods

To test this hypothesis the following studies were performed:

1. Computation of the absolute deviation from the mean for each case (x-3). Massie and Campbell interpret 3 and 4 as being the normal range, the scales themselves are clearly symmetrical having 5 points with 3 in the middle. We computed the mean for each scale for each session $y = absolute (x-3)$

2. We developed different ways of defining risk in attachment:
a.-Risk in block (scores of 1, 2 or 5 in three indicators of seven in each block).
b.-Percentage of blocks with risk in the session
c.-Average index:- Amount of scores of 1, 2 or 5 in each block, divided by 7 indicators

Results

1. As a result we found that in the last sessions both mother and baby are closer to the middle range (3: secure attachment), and all the attachment indicators are closer to the middle range in the last sessions both in the mother and the baby. (See Component 2.1 for more details)

2. We found highly significant correlation for all the risk indexes. They all show a decrease in the risk of attachment from the first session to the last one. We confirm the results of study 1. The main result of this project showed that these brief interventions had an impact in the attachment indicators from the first to the last session of each treatment in our sample of ten cases (20 sessions). The fact that in the first interview the mother is establishing the relationship with the therapist can make an impact in the attachment indicators because she could be more focused in the relationship with the therapist than in the interaction with the baby. Nevertheless, as we have 7 variables to study the non verbal interaction, if the mother is not looking at the baby, the interaction can be established through other non verbal channels.

Conclusions

These results are close to the findings of studies carried out by Van Ijzendoorn and colleagues (1995) which showed that short term focussed interventions in the attachment relationship between parent and child can be more effective in achieving prevention than long-term unfocussed ones. P. Fonagy states that "Short- term, nonintensive dynamic therapies are as or more helpful as intensive and long-term ones for non severe cases, but they are commonly associated with negative outcomes when applied to more complex and difficult (multiply co- morbid) cases." Our sample is a population under psychosocial risk and the patients were babies suffering from psychofunctional problems. We restrict our findings for this population. No treatment can be equally applicable without modification to every disorder. The way behaviour is organised, and the way two people co- construct their dyadic process, is very sensitive to context." (Fonagy, 1998)

References

Massie, H. & Campbell, K. (1983) The Massie-Campbell Scale of Mother Infant Attachment indicators During Stress. Application manual.
van IJzendoorn, M. H., Juffer, F., & Duyvesteyn, M. G. C. (1995). Breaking the intergenerational cycle of insecure attachment: A review of the effects of attachment-based interventions on maternal sensitivity and infant security. Journal of Child Psychology and Psychiatry, 36, 225-248.
Fonagy, P. (1998). Prevention, the appropriate target for infant psychotherapy. Infant Mental Health Journal, 19, 124-150.

COMPONENT 2.1: RISK IN ATTACHMENT

We consider a risk block (150 words) when 3 or more attachment indicators are rated as 1.2 or 5. 1-

Percentual risk index: The percentual risk index of a session is the percentage of risk blocks that the session has: RBE, RMA, RT

BABY PERCENTUAL RISK (10 CASES)

Case	First session	Last session
1	71.43	0
2	92	21.05
3	30	4
4	46.43	23.81
5	41.03	17.65
6	79.47	83.87
7	34.48	19.05
8	31.58	11.76
9	0	5
10	54.55	23.33

MOTHER PERCENTUAL RISK (10 CASES)

Case	First session	Last session
1	100	0
2	100	26.32
3	6.67	8
4	46.43	0
5	46.15	0
6	88.24	41.94
7	89.66	23.81
8	23.68	3.92
9	20	0
10	63.64	26.67

COMPARISON OF FIRST AND LAST SESSIONS

Paired Samples Test

		Paired Differences							
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
Pair 1	RBEF - RMAL	,3473	,2242	7,091E-02	,1869	,5077	4,898	9	,001
Pair 2	RMAF - RMAL	,4538	,2936	9,285E-02	,2438	,6639	4,888	9	,001
Pair 3	RTF - RTL	,3611	,2523	7,978E-02	,1807	,5416	4,527	9	,001

Test Statistics[b]

	RBEL - RBEF	RMAL - RMAF	RTL - RTF
Z	-2,497[a]	-2,701[a]	-2,803[a]
Asymp. Sig. (2-tailed)	,013	,007	,005
Exact Sig. (2-tailed)	,010	,004	,002
Exact Sig. (1-tailed)	,005	,002	,001
Point Probability	,002	,001	,001

a. Based on positive ranks.

b. Wilcoxon Signed Ranks Test

AVERAGE RISK IN BLOCK: Is the number of 1, 2, or 5 in each blocks divided into 7 (number of indicators).
The average by session of the average risk index will define another risk index by session.
IPPBE: Baby Percentage Index of Risk
IRPMA: Mother Percentage Index of Risk
IRPT: Percentage Index of Risk

AVERAGE RISK IN FIRST SESSION

ID	IRPBE	IRPMA	IRPT
1	0.55102041	0.7755102	0.66326531
2	0.74857143	0.78285714	0.76571429
3	0.36190476	0.2952381	0.32857143
4	0.43877551	0.42346939	0.43112245
5	0.50915751	0.52014652	0.51465201
6	0.58403361	0.72268908	0.65336134
7	0.50738916	0.74876847	0.62807882
8	0.41729323	0.36842105	0.39285714
9	0.2	0.2	0.2
10	0.54112554	0.54978355	0.54545455

AVERAGE RISK IN LAST SESSION

ID	IRPBE	IRPMA	IRPT
1	0.19047619	0.19047619	0.19047619
2	0.2406015	0.39849624	0.31954887
3	0.14285714	0.10285714	0.12285714
4	0.31292517	0.21088435	0.26190476
5	0.32773109	0.2605042	0.29411765
6	0.57142857	0.47004608	0.52073733
7	0.3537415	0.40136054	0.37755102
8	0.33053221	0.33333333	0.33193277
9	0.22142857	0.12857143	0.175
10	0.26666667	0.41904762	0.34285714

Quadratic index for risk: In previous indexes values 1, 2 or 5 were equally important.
Considering that 1 is a worse score than 2 and 5, we gave 2 and 5 the same weight.
As 3 and 4 are normal scores, we considered 3 as optimal attachment score.

We performed a quadratic index for risk in attachment adjusting a 2nd grade polynomial to these conditions.
If we name risk in variable R(x) we take x as hypothesis. R(1)=R(5)=1, minim 3 and R(3)=0.
With these restrictions (and a strong asymmetry of the scale) we came to the following equation:

$$R(x) = (1/4)x^2 - (6/4)\,x + (9/4)$$

Example of Baby Risk in one block:

$$RCB = \frac{\sum\limits_{x\ bebe} (0.16\ x^2 - 1.12\ x + 1.96)}{7}$$

QUADRATIC INDEX

ID	RCPBEF	RCPMAF	RCPTF	RCPBEL	RCPMAL	RCPTL
1	0,35903061	0,42620262	0,39261662	0,1984127	0,18253968	0,19047619
2	0,32168839	0,53188219	0,42678529	0,01513653	0,23268698	0,12391175
3	0,15023976	0,21559806	0,18291891	0,02280936	0,01419078	0,01850007
4	0,15623651	0,19067784	0,17345717	0,11910714	0,12514979	0,12212847
5	0,34798605	0,29157825	0,31978215	0,50927995	0,3096782	0,40947907
6	0,46888078	0,4885794	0,47873009	0,3644651	0,29219512	0,32833011
7	0,46033412	0,53319321	0,49676367	0,23564545	0,28859431	0,26211988
8	0,12884605	0,25459376	0,19171991	0,23120467	0,27053231	0,25086849
9	0,08029155	0,39493304	0,23761229	0,10404824	0,0164074	0,06022782
10	0,21710116	0,32399588	0,27054852	0,24983041	0,27666795	0,26324918

RCPBEF: Baby Quadratic Risk Index First Session
RCPMAF: Mother Quadratic Risk Index First Session
RCPTF: Total Quadratic Risk Index First Session
RCPBEL: Baby Quadratic Risk Index Last Session
RCPMAL: Mother Quadratic Risk Index Last Session
RCPTL: Total Quadratic Risk Index Last Session

COMPARISON BETWEEN FIRST AND LAST SESSION

Paired Samples Test

		Paired Differences							
					95% Confidence Interval of the Difference				Sig.
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	(2-tailed)
Pair 1	RCPBEF - RCPBEL	6,407E-02	,1475	4,665E-02	-4,15E-02	,1696	1,373	9	,203
Pair 2	RCPMAF - RCPMAL	,1643	,1368	4,326E-02	6,640E-02	,2621	3,797	9	,004
Pair 3	RCPTF - RCPTL	,1142	,1302	4,119E-02	2,099E-02	,2073	2,772	9	,022
Pair 4	RCBEF - RCBEL	,1312	,1455	4,602E-02	2,708E-02	,2353	2,850	9	,019
Pair 5	RCMAF - RCMAL	,1725	9,525E-02	3,012E-02	,1044	,2407	5,728	9	,000
Pair 6	RCTF - RCTL	,1519	,1146	3,625E-02	6,986E-02	,2339	4,189	9	,002

Test Statistics[b]

	RCPBEL - RCPBEF	RCPMAL - RCPMAF	RCPTL - RCPTF	RCBEL - RCBEF	RCMAL - RCMAF	RCTL - RCTF
Z	-1,274[a]	-2,497[a]	-2,090[a]	-1,988[a]	-2,803[a]	-2,701[a]
Asymp. Sig. (2-tailed)	,203	,013	,037	,047	,005	,007
Exact Sig. (2-tailed)	,232	,010	,037	,049	,002	,004
Exact Sig. (1-tailed)	,116	,005	,019	,024	,001	,002
Point Probability	,020	,002	,005	,006	,001	,001

a. Based on positive ranks.

b. Wilcoxon Signed Ranks Test

COMPONENT STUDY 3: STRENGTHENING BONDS IN BABY-CAREGIVER DYADS. INTERVENTIONS IN EARLY STAGES OF DEVELOPMENT (2004)

Aims

The purposes of this project are:

1. Early detection of psychofunctional risk factors in the baby and in the infant-caregiver interaction that can affect the infant's development.
2. Early interventions in the infant-caregiver relationship aiming to reduce the probability of risk for his/her integral health consisting on:
a) Brief psychotherapeutic interventions with mother- baby dyads.
b) Sensitise parents and caregivers to the use of their natural resources to promote healthy development in the baby.
3. Collecting and systematizing information about the psychofunctional risk factors and attachment of the consulting 0-2 year population at Social Welfare Institutions. (Banco de Previsión Social)
4. Based on this data (weaker items in the caregiver-baby relationship) produce guidelines for parents and health workers about the protective factors in the infant-caregiver bond.

Methods

All the consulting population at the Mother-Infant Medical Center No. 1 of Banco de Previsión Social (22,000 users in 2001, 23,000 estimated users for 2004) will receive information and be sensitised to the protective factors in the caregiver-infant bond.

Early detection of psychofunctional risk factors in the mother/father/caregiver-baby bond that may affect his/her development.

1. Application of Symptom Check List (Robert-Tissot et al, 1989) to 300 mother-baby dyads.
2. Application of the Attachment Scale in Stress Situations (Massie & Campbell, 1983) to 300 mother-baby dyads
3. Application of the Depression Scale (Center of Epidemiologic Studies of the United States, 1977) to 300 mother-baby dyads
4. Psychological interviews of mother - baby dyads
5. Clinical and statistical analysis of the instruments that were applied
6. Selection of mother/father-baby at risk conjunctions
7. 5 Psychotherapeutic interviews with 100 mother-baby dyads at risk.
8. Evaluation with the same instruments applied for detection (Symptom Check List, Attachment During Stress Scale (Massie-Campbell), Depression Scale (Center of Epidemiologic Studies of the United States)

The transmission of the protective factors will be carried out with video tapes and information guides distributed in the education and health centres in all the zone of influence.

This is an ongoing project backed up by UNICEF, Instituto Interamericano del Niño (OEA), and the National Ministry of Public Health.

Results

This project is ongoing.

References

Center of Epidemiologic Studies of the United States (1977) Depression Scale. West Publishing Company/Applied Psychological Measurements, Inc.

Massie, H. & Campbell, K. (1983) The Massie-Campbell Scale of Mother Infant Attachment Indicators During Stress. Application manual.

Robert-Tissot, C., Rusconi Serpa, S., Bachmann, J., Cramer, B., Knauer, D., de Muralt, M., Palacio-Espasa, F. & Stern, D. (1989) Detección de trastornos psicofuncionales en la primera infancia. Translation and authorized adaptation to Spanish by Missio, M. and Botet, F. Ed. Masson, Barcelona, 2001

[return to the overall summary of this research program](#)

COMPONENT STUDY 4: NON-VERBAL INTERACTION THROUGH PLAY AND AFFECT REGULATION (2001)

Aims

The definition of affect used in the Massie-Campbell Scale was not precise, so we took an instrument (the CPTI) that included the complexity of different affects in the play.

We aimed to test the hypothesis that the moments of play (Cornell Play Therapy Scales, P. Kernberg et al., 1998) produce changes in the attachment scores as measured by Massie & Campbell.

Methods

1. Study of play
For this variable we will use the following scales of the Cornell Play Therapy Scales:
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.
c) Single case study (descriptive analysis).

Results

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

6 raters segmented the vignettes and classified the infants activity, identifying the Play Activity segments (Kernberg et al., 1998)

Results of reliability analysis: Kappa inter-judge agreement: mean (0,59), range (0,20-1,0) We found one of the judges (n°6) had low agreements and eliminated this problem, resulting in an average agreement of: 0,78, range: 0,25-1,00

c) Single case descriptive analysis

This is an ongoing study. This type of analysis corresponds to the non-verbal symbolic and sub-symbolic interaction.

References

Kernberg, P. F., Chazan, S. E. & Normandin, L. (1998) The Children's Play Therapy Instrument (CPTI): Description, Development, and Reliability Studies J Psychother Pract Res 7:196-207.

COMPONENT STUDY 5: MODELS OF MOTHER-BABY INTERACTION (VERBAL AND NON-VERBAL) IN THE PSYCHOTHERAPEUTIC PROCESS.
MICRO ANALYTIC STUDY WITH THE APPLICATION OF A MATHEMATICAL METHOD (BOX-JENKINS).
(2003-2004)

Aims

Regarding our previous results (no correlation between verbal and non verbal interaction) our aim was to test the following hypothesis:

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 focused on 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 child's behaviour: in a non verbal way or in a verbal way and how many lags after?

Methods

To test this hypothesis the following studies were performed for one case:

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 disloaded.) 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 (Box & Jenkins, 1976). 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 (Yn= a+b Yn-1+Et) ties linearly the value of a variable with its value in the time t=n with it's 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.

5. Multivariate series to identify these models (see Component 5.1 for more information). 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.

Results

We observed that in this case verbal and non verbal variables correlated in a cross lagged way (see component 5.2 for more information).

We can see how subsymbolic systems determine the symbolic system in this complex mathematical model (see component 5.3 for more information).

Conclusions

In this single case study we found mutual influence between both systems: the variables that influence the verbal system are all non-verbal, and one of the verbal variables influences the non-verbal system (emotional tone). These findings, together with our conclusions from the study of ten cases "Comparing verbal exchange of mother and analyst and non-verbal interaction between mothers and babies with functional problems (component study 1)" in which we found that there are two different information processing modalities, the verbal processing through the speech in the session, and the non verbal interaction between the mother, are consistent with Wilma Bucci´s statements that "These two levels are continuously affecting each other: the struggle to symbolise the non verbal level can be seen as one of the major goals of psychoanalysis, and the nature of the symbolisation can then potentially affect the non verbal level." (Bucci, 1997)

References

Box, G & Jenkins, G. (1976) Time Series Analysis. Forecasting and control. Holden Day Oakland.
Bucci, W. (1997). Psychoanalysis and cognitive science: A multiple code theory. New York: Guilford Press

COMPONENT 5.1: MULTIVARIATE MODELS CASE Nº7

GAZ1(t)=-0,65 PROX2(t-3)-0,71 PROX1(t-1)+0,63 PROX1(t) **R2=0,45**
VOC1(t)=1,09 AFF2(t)+0,50 AFF1(t-1)-0,30 GAZ2(t) **R2=0,36**
TOA1(t)=0,27 TOB2(t)+0,73 TOB1(t)-0,48 HOL2(t)+0,96 HOL1(t-2)+0,36 AFF1(t-3) **R2=0,87**
TOB1(t)=0,39 TOB2(t)+0,14 TOA1(t)-2,81 ETP(t-1) **R2=0,59**
HOL1(t)=0,57 HOL2(t)+4,42 ETP(t) **R2=0,52**
AFF1(t)=-0,41 HOL2(t-1) **R2=0,23**
PROX1(t)=0,89 VOC2(t)+0,26 GAZ1(t) **R2=0,54**
GAZ2(t)=1,33 PROX2(t-2)+1,17 AFF2(t) **R2=0,29**
VOC2(t)=-0,34 PROX1(t-1)+0,35 PROX1(t)+0,12 GAZ1(t-1) **R2=0,75**
HOL2(t)=0,72 HOL1(t)+6,18 ETP(t-1)-0,19 TOA1(t) **R2=0,67**
TOA2(t)=0,87 TOB2(t)-0,65 HOL2(t)+0,49 HOL1(t-1) **R2=0,63**
TOB2(t)=0,9 TOB1(t) +0,62 TOB1(t-1)+0,18 TOA2(t) **R2=0,81**
AFF2(t)= 0,13 VOC1(t)-0,20 TOB2(t) **R2=0,34**
PROX2(t)=-0,30 TOB2(t-3)-0,19 TOA2(t-2) **R2=0,33**
HIP(t)=-0,12 TOB1(t-1)-0,12 AFF2(t-3)-0,05 GAZ1(t) **R2=0,37**
ETP(t)=-0,01 TOA2(t-3)+0,02 HOL1(t) **R2=0,30**
AWP=0,002 TOB1(t-1) **R2=0,11**

Non verbal	Verbal
GAZ1: Baby Gazing	ETP: Emotional Tone of the Patient
VOC1: Baby Vocalizing	AWP: Abstract Word of Patient
TOA1: Baby Touching A	HIP: Referential Activity of patient
TOB1: Baby Touching B	
HOL1: Baby Holding	
AFF1: Baby Affect	
PROX1: Baby Proximity	
GAZ2: Mother Gazing	
VOC2: Mother Vocalizing	
TOA2: Mother Touching A	
TOB2: Mother Touching B	
HOL2: Mother Holding	
AFF2: Mother Affect	
PROX2: Mother Proximity	

COMPONENT 5.2: VERBAL-NON VERBAL CROSS-LAGGED CORRELATIONS

- 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

Three indicators influence referential activity of the mother:
HIP(t)=-0,12 TOB1(t-1)-0,12 AFF2(t-3)-0,05 GAZ1(t) R2=0,37

- less expression of her emotions three lags before (affect 2)
- less rejection of the physical contact one lag before of the baby
- less gazing in the same lag of the baby

The emotional tone of the mother is influenced by two indicators:
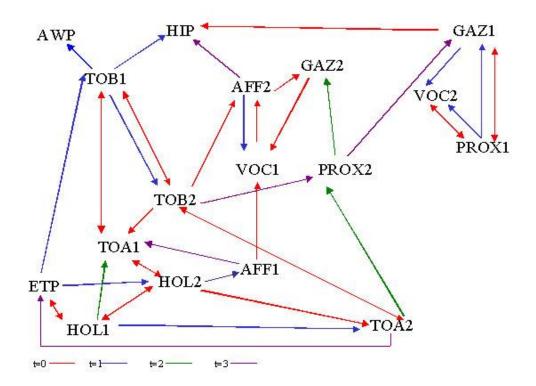ETP(t)=-0,01 TOA2(t-3)+0,02 HOL1(t) R2=0,30

- her less physical contact three lags before with her daughter
- and the baby´s holding in the same lag

Holding is the only baby´s indicator that shows an influence on the mother´s emotional tone.

In this case the models found for the nonverbal variables are better determined (R2=0,23-0,87) than those found for the verbal variables (R2= 0,11-0,37).

COMPONENT 5.3: MOTHER-BABY INTERACTIONAL PATTERN. CASE Nº7

t=0: same lag
t=1: one lag before
t=2: two lags before
t=3: three lags before

Non verbal	Verbal
GAZ1: Baby Gazing	ETP: Emotional Tone of the Patient
VOC1: Baby Vocalizing	AWP: Abstract Word of Patient
TOA1: Baby Touching A	HIP: Referential Activity of patient
TOB1: Baby Touching B	
HOL1: Baby Holding	
AFF1: Baby Affect	
PROX1: Baby Proximity	
GAZ2: Mother Gazing	
VOC2: Mother Vocalizing	
TOA2: Mother Touching A	
TOB2: Mother Touching B	
HOL2: Mother Holding	
AFF2: Mother Affect	
PROX2: Mother Proximity	