I.- Title of Project: *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 Infants' Attachment Indicators (Massie Campbell Scale)***

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3.- Amount of money awarded: U$8.000

4.- Start date of project.
September 1998

5.- Brief Summary of Research Objectives

The present study will test the following hypothesis:
The psychoanalytically oriented psychotherapeutic interview has an effect in the attachment indicators (this hypotesis derives from a pilot study).Encouraging the mother to recall a narrative that integrates the baby´s intiatives, gestures, improves the attachment and the quality of the interactions. We expect that the subjects change from the extreme points (insecure, avoidant and over-anxious) towards the middle range (secure attachment) if the attachment regulation gets better as an effect of the therapeutic meetings.

This hypotesis will be proved exploring the relationship between the linguistic measures (emotional tone, abstract words, referential activity) and the attachment indicators (gazing, vocalizing, holding, proximity, affect, touching). We developed a series of sub-hypotheses in order to study these relationships

We studied the first and last session of these brief treatments using Massie Campbel scale and Mergenthaler and Bucci´s Therapeutic Cycles Model.

The project also includes the development of treatment guideliness steamming from a limited sample of ten cases. (see page.....)

This is the first empirical study of psychotherapeutic process in early mother-baby interaction developed in Uruguay.- Previous work was done in the field but from a clincal and theoretical perspective .(observational studies were develop but not in the field of psychotherapy.)

6.- Overview of work accomplished to date.

All the steps were accomplish as plannified. Two studies were added to the original plan : development of a concept of "risk in attachment" and development of a criteria for classification of "the quality of the therapeutic cycles".
The research plan was completed in a longer period of time than expected. During this period different adjustments of the instruments were needed. As the Spanish dictionaries of the cycles model are still not inbuilt different versions of them were elaborated and checked

during this time. This dictionaries were reviewed, reliability studies were performed and a new version of the software had to be developed in order to take into account Spanish diacritic characters. and other characteristics of the segmentation. These versions were developed in the Informatic Section of the Department of Psychoterapy and Psychosomatic of Ulm (E. Mergenthaler, S.Heim) Although we needed more time than originally planned, as a result this project improved the quality of the Cycles Model software for Spanish language.

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

7.-.- Tasks outstanding to accomplish objectives.
Once the text material was analyzed using the cycles model and the non verbal indicators were rated we develop the following studies:

Hypothesis 1.- The psychotherapeutic interviews have an effect in the attachment indicators: the subjects change from the extreme points (insecure, avoidant and over-anxious) towards the middle range (secure attachment)

1- Computation of the absolute deviation from the mean for each case. (x-3)
All Masssie Campbell variables are considered quantitative except "affect" (this indicator measures a different aspect than the others ranging from negative to positive emotion, so it is not comparable with the other ratings ranging from never to always. For this reason Affect was excluded from the overall measure).

Massie and Campbell interpret 3 and 4 as being the normal range, the scale themselves are clearly symmetrical having 5 points with 3 in the middle.
We computed the mean for each scale for each session.

Poner grafica ahí. Analia
See appendix A

2.-Computation of absolute deviation from the mean for each scale
y= absolute (x-3)

As a results we find that in the last sessions both mother and baby are closer to the middle range (3, secure attachment. And all the indicators are closer to the middle range in the last sessions both in the mother and the baby.
This hypothesis is proved
See Appendix B

3.-Study of "risk in attachment".
This study goes in the same direction as study number 1 and 2 ,looking for testing hypothesis 1.

As Massie Campbell states:".... This scale is not designed to produce a single correct score. Ratings at 1,2, and or 5 of 2 or more behaviors on succesive visits (2 or more) suggest the need for a diagnostic evaluation of parents and infants that ... Serialy observed aberrant interaction warns that the child maybe at developmental risk." (page 20. Massie Campbell

scale of mother infant attachment during stress). According to this idea of risk we developed different ways of defining risk in attachment:

1. Risk in block. (when we have scores of 1, 2 or 5 in three indicators of seven in each block.

2.- Percentage of blocks with risk in the session (RBE –baby), (RMA.-mother),(RT- mother and baby)

3-- Average index
Amount of scores of 1, 2 or 5 in each block, divided by 7 indicators
The mean of average index in the session : is indicated by
IRB,IRM, IRPT

We found highly significant correlations between all these indexes. See table with correlations.

All this indexes show a decrease in the risk of attachment from the first session to the last one. Once again we find the same results as the one in study 1. In order to see if the amount of words spoken in the session had an impact in these results- the more the mother is speaking or occupied listening to the therapists words the less available she is for the interaction with her baby.- we develop a complementary study taking into account the number of words by session. The first session have more words than the last ones except in case number 8. This was the case with a different functional problem. (eating disorder) There are many elements that could explain the decrease of risk in attachment in the last session., mainly that the tension decreases along the interviews (the mother gets used to the new enviroment , feeling more confortable as the sessions take place) Probably the first session has more words b ecause the mother is reporting about the baby´s illness in this very first encounter.and she probably is more anxious about it.

4–Hypothesis 2 .
The presence of certain non- verbal and verbal indicators are associate with the decrease of "risk in attachment."
2.1 High scores in all the mother´s non-verbal indicators decrease the "risk in attachment"
2.2 High proportion of emotional words in the speech is associated with the decrease in the "risk in attachment"
2.3 High proportion of abstract words is associated with an increase in the "risk in attachment"
2.4 Hay estudios que correlacionan risk con patterns?

Study of correlation linguistic patterns attachment indicators.

2.1 High scores in all the mother´s non-verbal indicators decrease the "risk in attachment"

Pearsons correlation was used .....

In the first sessions we found a negative correlation (-0.79) between the mother ´s gazing with the percentage of blocks with risk. The less the mother looks at the baby the more risk in her attachment. This correlation decreases in the last session (-0.35)

The vocalization of the mother is negatively correlated with the risk in her attachment in both first and last sessions The less the mother vocalizes at the baby the more risk in her attachment. This correlation decreases in the last session (-0.68 and –0.60)
The correlation between some indicators (gazing, touching b) decreases from the first to the last sessions . Only vocalizing has a negative correlation with risk in attachment both in first and last session.

This results have practical implications for therapeutic interventions. In order to improve the mother´s attachment this interventions should stimulate her to gaze, to vocalize and to touch the baby.(*)

There is a negative correlation between the baby´s gazing and touching A with risk. The more the baby gazes at the mother and seeks to touch her the less risk in attachment.

See apendix C
(*) This results point the importance of lullabyes in attachment as we have mention in other studies . (1998)

Hypothesis 2.5

High proportion of emotional words in the speech is associated with the decrease in the "risk in attachment"

Hypothesis 2.6
High proportion of abstract words is associated with an increase in the "risk in attachment"
Abstract words have the higher correlation with risk among the other linguistic measures.(0.57 in the first sessions changing to –0.19 in the last ones) The more abstract words in the speech the more risk in the mother´s attachment.

A mathematical procedure can allow us to determine the risk taking into account the number of abstract words. See apendix. D (linear regression of the mean)

Hypothesis 2.6
Hay estudios que correlacionan risk con patterns?

Hypothesis 2.7
High computarized referencial activity (narratives) is associated with a decrease in the "risk in attachment"

Hypothesis 3

We expect to find correlations between the verbal system and the non-verbal system

3.1 We expect to find positive correlations between the emotional tone and the non-verbal indicator affect, holding , gazing in the mother

3.2 We expect to find negative correlations between the abstract words and the non-verbal indicator (affect) in the mother

3.3 We expect to find more correlations between the attachment indicators in the connecting and experiencing patterns than in reflecting and relaxing. We supposed that when the emotional tone is activated (experiencing patterns) and even more when emotional tone and abstraction are simultaneously activated (insight-connecting patterns) the non-verbal exchanges are more activated than in other moments.

PATTERNS CORRELATIONS

Relaxing	Reflecting	Experiencing	Connecting
• **Baby Gazing-Mother Gazing (0.63)** • **Baby Gazing- Mother Vocalizing (0.67)** • Mother Holding- Baby Touching A (0.68) • Baby Proximity- Mother Holding (0.68)		• Baby Touching A- Mother Touching A (0.65)	• Baby Gazing- Baby Vocalizing (0.66) • Baby Holding- Baby Touch A (0.64) • **Mother Gazing- Baby Gazing (0.75)** • **Baby Gazing- Mother Vocalizing (0.76)** • Baby Holding- Mother Holding (0.75)

The hypothesis is parcially proved the patterns that show more correlations between the non verbal indicators are relaxing and connecting. In both of them we found synchrony beteween the mother and the baby´s gazing,and also a positive correlation between the baby´s gazing and the mother´s vocalizing. The relaxing pattern is a moment where the speech is free from an emotional and abstract influence, nevertheless it is a significant moment in terms of non-verbal exchanges.

2.5 In the reflecting pattern the non-verbal indicators are independent from the linguistic level. In this pattern we find an increase of abstract words. This result is related to the one in the hypothesis 2.3: High proportion of abstract words is associated with an increase in the "risk in attachment"

Correlational studies in linguistic measures-attachment indicators in the ten cases. See apendix D.

- In this study we collapsed the session of each patient as a case. The most interesting result is the negative correlation between emotional tone in the speech with the affect as a non verbal indicator. It seems that when the mother is expressing affect through language the nonverbal indicator of affect is not activated.

Another study was performed in order to explore the changes in the correlations between the two systems in the first and last session. The results show some changes but we are not going to generalize this results because we can´t interpretate them in the context of the session they belong . In this point it would be necessary to develop a study per pacient, per session in order to underestand the reason for the changes in the correlations between the first and last session. See apendix E-

We expect to find significant correlations bvetween the linguistic measures and attachment indicators in the productive sessions.

Productivity was define according to a clinical and empirical criteria.
Clinical criteria
(INSERTAR CLINICAL CRITERIA)

Empirical Criteria

CLASSIFICATION OF QUALITY OF CYCLE

1 **NO CYCLE** - Any configuration of scores that does not meet the defined criteria.

2 **NOT SUCCESSFUL CYCLE** - Sequence of CRA, Experiencing pattern (increase of ET) but no connecting pattern (temporal coincidence of ET and AW).

3 **MINIMAL CYCLE** - All the components present but the cycle is interrupted or comprises a very short proportion of the session.

4 **GOOD CYCLE** - A cycle or a sequence of more than one cycle in a session, with no AW interruption and including a CRA peak followed by ET and AW.

5 **VERY GOOD CYCLE -** A cycle which comprises a large proportion of the therapy session or a sequence of more than one cycle in a session, having no AW interruption and including a high CRA peak followed by abundant ET and AW.

3.1 Comparative study in the Clinically productive sessions and the non-productive ones.

RESULTS

	NON PRODUCTIVE	PRODUCTIVE
CLINICALLY SELECTED SESSIONS	• **No correlation Ling. M. X Attachm. I.** • **Low correlat. in Attach.I**	• **No Significant correlat. Ling. M. X Attachm. I.** • **Significant correlat. In Attach I.(synchrony)**
QUALITY OF CYCLES	• **Highly significant correlations Ling. M. X Attachm. I.** • **Highly significant correlations in Attach.I**	• **No correlation Ling. M. X Attachm. I.** • **Very Low .Correlat. in Attachm. I.**

The hypothesis is not proved. The productive moments, both clinically productive and with as productive speech in terms of cycles show no correlation between the two systems: verbal and no verbal system. But using as clinical criteria the productive sessions have high correlations inbetween the attachment indicators. Only when the speech is non-productive according to the cycles model we found highly significant correlations between the two systems. In the productive sessions both clinically and empirical studied the verbal and no-verbal system are independent.

Paired t test were calculated (two sided) Study of normality of variables (t test Kolmogorov Smirnov)

LEVEL	SIGNIFICANCE
5%	Significant
1%	Highly significant
0,1%	Statistically confirmed

See Appendix C

The hypothesis is accepted.
y in the second session is smaller

	NON PRODUCTIVE	PRODUCTIVE
CLINICALLY SELECTED SESSIONS	• **No correlation Ling. M. X Attachm. I.** • **Low correlat. in Attach.I**	• **No Significant correlat. Ling. M. X Attachm. I.** • **Significant correlat. In Attach I.(synchrony)**
CLINICALLY SELECTED BLOCKS	• **No correlation Ling. M. X Attachm. I.** • **Low correlat in Attach.I**	• **No correlation Ling. M. X Attachm. I.** • **Highly Signif.Correlat. in Attachm. I.**

Clinical criteria of productivity

Capacity of the mother to reflect upon herself and communicate to the therapist
Capacity of the mother to reflect upon the baby's initiatives (gestures, plays, needs, emotional and psychical states)
Capacity of the mother to reflect upon the therapist's interventions
Capacity of the infant to enact his difficulties through the play and work them through in the frame of the therapueutic relationship.
Capacity of the therapist to percieve and communicate in the present situation the anxieties and difficulties of the dyad.

The classification considers not only the therapeutic work but specially the response of the patient to the therapist's intervention.

Criteria for classification:
5 points rating scale-

5 Highly productive: 5 of these items
4 Very productive: 4 items
3 Productive: 3 items
2 Almost productive: 2 items
1 No productive: 1 item or no item

PATIENT	SESSION	CYCLES PRODUCTIVITY	CLINICAL PRODUCTIVITY
Antonio Javier	First	Not succesfull -	Very productive +
	Last	Good +	Very productive
Daiana	First	Minimal +	Very productive
	Last	Very Good +	Highly productive +
Leandro	First	Minimal	Almost productive -
	Last	Minimal	Almost productive
Lucas	First	Minimal	Productive +
	Last	Minimal	Productive
Matías	First	Minimal	Very productive
	Last	Minimal	Highly productive
Betiana	First	No cycle -	Almost productive
	Last	No cycle	Almost productive
Tamara	First	Minimal	Productive
	Last	Good	Very productive
Veronica	First	Minimal	Productive
	Last	Very Good	Highly productive
Alexis	First	No cycle	Productive
	Last	Minimal	Productive
LeanV	First	Good	Almost productive
	Last	No cycle	Almost productive

Risk correlations in Attachment Indicators (Index 2)

Mother
Gazing 0.79 to –0.35
Vocalizing –0.68 to –0.60
Touching A –0.08 to –0.26
Touching B 0.89 to 0.13

Baby
Gazing –0.67 to –0.46
Affect –0.51 to –0.46
Touching A –0.56 to –0.62

Risk correlation in Linguistic measures (Index 2)

Mother
Emotional Tone –0.10 to –0.28
Referentioal Activity –0.39 to 0.02
Abstract Words 0.57 to –0.19

Mother & Therapist
Emotional Tone –0.07 to 0.25
Referential Activity –0.23 to 0
Abstract Words 0.56 to –0.02

APENDIX F
STUDY OF RISK

DEFINITION 1- A block of risk is when 3 or more values 1, 2 or 5 appear (block A)

DEFINITION 2 INDEX1 Percentual Risk Index of a session is the percentage of blocks of risk a session has RBE,RMA, RT

Individuo 1	Sesión 1							
Riesgo bebé		Porcentaje	Riesgo mamá		Porcentaje	Riesgo total		Porcentaje
A	10	71.43%	A	14	100.00%	A	10	71.43%
B	4	28.57%	B	0	0.00%	M	4	28.57%
	14	100.00%		14	100.00%	B	0	0.00%
							14	100.00%
Individuo 1	Sesión 3							
Riesgo bebé		Porcentaje	Riesgo mamá		Porcentaje	Riesgo total		Porcentaje
A	0	0.00%	A	0	0.00%	A	0	0.00%
B	3	100.00%	B	3	100.00%	M	0	0.00%
	3	100.00%		3	100.00%	B	3	100.00%
							3	100.00%
Individuo 10	Sesión 1							
Riesgo bebé		Porcentaje	Riesgo mamá		Porcentaje	Riesgo total		Porcentaje
A	18	54.55%	A	21	63.64%	A	0	0.00%
B	15	45.45%	B	12	36.36%	M	0	0.00%
	33	100.00%		33	100.00%	B	3	100.00%
							3	100.00%
Individuo 10	Sesión 3							
Riesgo bebé		Porcentaje	Riesgo mamá		Porcentaje	Riesgo total		Porcentaje
A	7	23.33%	A	8	26.67%	A	1	3.33%
B	23	76.67%	B	22	73.33%	M	13	43.33%
	30	100.00%		30	100.00%	B	16	53.33%
							30	100.00%
Ndividuo 2	Sesión 1							
Riesgo bebé		Porcentaje	Riesgo mamá		Porcentaje	Riesgo total		Porcentaje
Riesgo		Porcentaje	Riesgo		Porcentaje	Riesgo		Porcentaje

bebé			mamá			total		
A	23	92%	A	25	100%	A	23	92%
B	2	8%	B	0	0%	M	2	8%
	25	100.00%		25	100.00%	B	0	0%
							25	100.00%
Individuo 2	Sesión 3							
Riesgo bebé		Porcentaje	Riesgo mamá		Porcentaje	Riesgo total		Porcentaje
A	4	21.05%	A	5	26.32%	A	4	21.05%
B	15	78.95%	B	14	73.68%	M	1	5.26%
	19	100.00%		19	100.00%	B	14	73.68%
							19	100.00%
Individuo 3	Sesión 1							
Riesgo bebé		Porcentaje	Riesgo mamá		Porcentaje	Riesgo total		Porcentaje
A	9	30.00%	A	2	6.67%	A	1	3.33%
B	21	70.00%	B	28	93.33%	M	9	30.00%
	30	100.00%		30	100.00%	B	20	66.67%
							30	100.00%
Individuo 3	Sesión 2							
Riesgo bebé		Porcentaje	Riesgo mamá		Porcentaje	Riesgo total		Porcentaje
A	1	4.00%	A	2	8.00%	A	1	4.00%
B	24	96.00%	B	23	92.00%	M	1	4.00%
	25	100.00%		25	100.00%	B	23	92.00%
							25	100.00%
Individuo 4	Sesión 1							
Riesgo bebé		Porcentaje	Riesgo mamá		Porcentaje	Riesgo total		Porcentaje
A	13	46.43%	A	13	46.43%	A	10	35.71%
B	15	53.57%	B	15	53.57%	M	6	21.43%
	28	100.00%		28	100.00%	B	12	42.86%
							28	100.00%
Individuo 4	Sesión 3							
Riesgo bebé		Porcentaje	Riesgo mamá		Porcentaje	Riesgo total		Porcentaje
A	5	23.81%	A	0	0.00%	A	0	0.00%
B	16	76.19%	B	21	100.00%	M	5	23.81%
	21	100.00%		21	100.00%	B	16	76.19%
							21	100.00%
Individuo 5	Sesión 2							
Riesgo bebé		Porcentaje	Riesgo mamá		Porcentaje	Riesgo total		Porcentaje
A	16	41.03%	A	18	46.15%	A	11	28.21%
B	23	58.97%	B	21	53.85%	M	12	30.77%
	39	100.00%		39	100.00%	B	16	41.03%
Individuo 5	Sesión 4							
Riesgo bebé		Porcentaje	Riesgo mamá		Porcentaje	Riesgo total		Porcentaje
A	3	17.65%	A	0	0.00%	A	0	0.00%
B	14	82.35%	B	17	100.00%	M	3	17.65%
	17	100.00%		17	100.00%	B	14	82.35%
							17	100.00%
Individuo 6	Sesión 1							
Riesgo bebé		Porcentaje	Riesgo mamá		Porcentaje	Riesgo total		Porcentaje
A	26	76.47%	A	30	88.24%	A	23	67.65%
B	8	23.53%	B	4	11.76%	M	10	29.41%
	34	100.00%		34	100.00%	B	1	2.94%
							34	100.00%
Individuo 6	Sesión 3							
Riesgo bebé		Porcentaje	Riesgo mamá		Porcentaje	Riesgo total		Porcentaje
A	26	83.87%	A	13	41.94%	A	11	35.48%
B	5	16.13%	B	18	58.06%	M	17	54.84%

	31	100.00%		31	100.00%	B	3	9.68%
							31	100.00%
Individuo 7	Sesión 1							
Riesgo bebé		Porcentaje	Riesgo mamá		Porcentaje	Riesgo total		Porcentaje
A	10	34.48%	A	26	89.66%	A	10	34.48%
B	19	65.52%	B	3	10.34%	M	16	55.17%
	29	100.00%		29	100.00%	B	3	10.34%
							29	100.00%
Individuo 7	Sesión 3							
Riesgo bebé		Porcentaje	Riesgo mamá		Porcentaje	Riesgo total		Porcentaje
A	4	19.05%	A	5	23.81%	A	0	0.00%
B	17	80.95%	B	16	76.19%	M	9	42.86%
	21	100.00%		21	100.00%	B	12	57.14%
							21	100.00%
Individuo 8	Sesión 1							
Riesgo bebé		Porcentaje	Riesgo mamá		Porcentaje	Riesgo total		Porcentaje
A	12	31.58%	A	9	23.68%	A	5	13.16%
B	26	68.42%	B	29	76.32%	M	11	28.95%
	38	100.00%		38	100.00%	B	22	57.89%
							38	100.00%
Individuo 8	Sesión 3							
Riesgo bebé		Porcentaje	Riesgo mamá		Porcentaje	Riesgo total		Porcentaje
A	6	11.76%	A	2	3.92%	A	1	1.96%
B	45	88.24%	B	49	96.08%	M	6	11.76%
	51	100.00%		51	100.00%	B	44	86.27%
							51	100.00%
Individuo 9	Sesión 1							
Riesgo bebé		Porcentaje	Riesgo mamá		Porcentaje	Riesgo total		Porcentaje
A	0	0.00%	A	2	20.00%	A	0	0.00%
B	10	100.00%	B	8	80.00%	M	2	20.00%
	10	100.00%		10	100.00%	B	8	80.00%
							10	100.00%
Individuo 9	Sesión 3							
Riesgo bebé		Porcentaje	Riesgo mamá		Porcentaje	Riesgo total		Porcentaje
A	1	5.00%	A	0	0.00%	A	0	0.00%
B	19	95.00%	B	20	100.00%	M	1	5.00%
	20	100.00%		20	100.00%	B	19	95.00%
							20	100.00%

Table Nº8

PATIENT Nº	Identification	SESSION	RISK (%)		Number of words
			Baby	Mother	
1	Antonio	101	71.43	100	2100
		103	0	0	450
2	Daiana	201	92	100	3750
		203	21.05	23.32	2850
3	Leandro	301	30	6.67	4500
		303	4	8	3750
4	Lucas	401	46.43	46.43	4200
		403	23.81	0	3150
5	Matías	502	41.03	46.15	5850
		504	17.65	0	2550
6	Betiana	601	76.47	88.24	5100

7	Tamara	602	83.87	41.94	4650
		701	34.48	89.66	4350
		703	19.05	23.81	3150
8	Verónica	801	31.58	23.68	5550
		803	11.76	3.92	7650
9	Alexis	901	0	20	1500
		903	5	0	3000
10	LeanV	101	54.55	63.64	4950
		103	23.33	26.67	4500

TEST T

Baby

```
 [1] 71.43 92.00 30.00 46.43 41.03 76.47 34.48 31.58
 [9]  0.00 54.55
 [1]  0.00 21.05  4.00 23.81 17.65 83.87 19.05 11.76
 [9]  5.00 23.33

      Paired t-Test
data:  x and y
t = 3.1961, df = 9, p-value = 0.0109
alternative hypothesis: true mean of differences is not equal to 0
95 percent confidence interval:
  7.844583 45.845417
sample estimates:
 mean of x - y
        26.845


Exact Wilcoxon signed-rank test
data:  x and y
signed-rank statistic V = 52, n = 10, p-value = 0.0098
alternative hypothesis: true mu is not equal to 0
```

Mother

```
 [1] 100.00 100.00   6.67  46.43  46.15  88.24  89.66
 [8]  23.68  20.00  63.64
 [1]  0.00 26.32  8.00  0.00  0.00 41.94 23.81  3.92
 [9]  0.00 26.67



      Paired t-Test
data:  x and y
t = 4.8876, df = 9, p-value = 0.0009
alternative hypothesis: true mean of differences is not equal to 0
95 percent confidence interval:
 24.37705 66.38495
sample estimates:
 mean of x - y
        45.381

      Exact Wilcoxon signed-rank test

data:  x and y
signed-rank statistic V = 54, n = 10, p-value = 0.0039
alternative hypothesis: true mu is not equal to 0

In every case the null hypothesis is rejected (equallity)
Risk index (Percentage) has decreased for mother and baby, and with more importance
for the mother.
```

Veamos ahora otra definicion de indice

DEFINITION 3 AVERAGE INDEX Number of 1,2 o 5 per block divided per 7
The average of Average Index can be considered another index by session (IRPBE,IRPMA;IRPT)

DEFINICION 4 INDICE CUADRATICO

Objetivo. En los anteriores índices los valores 1 , 2 y 5 eran equivalentes y se les otorgaba la misma importancia. Consideramos que el 1 tiene un mayor peso(más prejudicial) que el 2 y el 5 y a estos últimos les dimos igual importancia, además como el 3 y 4 son comportamientos normales se supuso que el apego óptimo se encontraba en el 3,5 (en realidad estaría más cercano al 4)
Se decide entonces realizar un índice de riesgo cuadrático ajustando un polinomio de segundo grado a las condiciones anteriores .
Si llamamos R(x) al riesgo en la variable x tomamos como hipótesis
R(1)=1, el mínimo este en 3.5 y R(2)=R(5).
Con estas restricciones (actua aca fuertemente la asimetría de la escala) se llegó a la siguiente ecuación

R(x)= $0.16\,x^2 - 1.12\,x + 1.96$

El riesgo total será el promedio de los riesgos en cada variable

Ejemplo Riesgo del Bebe en un bloque $RCB = \dfrac{\sum_{x\ \ bebe}(0.16\,x^2 - 1.12\,x + 1.96)}{7}$

Este índice tiene la ventaja respecto al promedio que pondera en forma diferente a los difrentes valores que puede tomar la variable.
El indice anterior se calcula para cada bloque para calcular el índice cuadrático por sesión damos dos alternativas

1- A partir de las medias de las variables aplicar la fórmula anterior (variables RCBE;RCMA;RCT)
2- A partir de los riesgos cuadráticos por bloque calcular la media de estos (variables PRCBE;PRCMA;PRCT)

Disminución del riesgo

```
       Paired t-Test

data:  PROMFIRST$RCBE and PROMSEC$RCBE
t = 1.0593, df = 9, p-value = 0.3171
alternative hypothesis: true mean of differences is not equal to 0
95 percent confidence interval:
 -0.06004962  0.16581850
sample estimates:
 mean of x - y
    0.05288444


       Paired t-Test

data:  PROMFIRST$RCMA and PROMSEC$RCMA
t = 3.3978, df = 9, p-value = 0.0079
alternative hypothesis: true mean of differences is not equal to 0
95 percent confidence interval:
 0.04453363 0.22195253
sample estimates:
 mean of x - y
     0.1332431


       Paired t-Test

data:  PROMFIRST$RCT and PROMSEC$RCT
t = 2.3782, df = 9, p-value = 0.0413
alternative hypothesis: true mean of differences is not equal to 0
95 percent confidence interval:
 0.00454149 0.18158603
sample estimates:
 mean of x - y
```

```
    0.09306376


       Paired t-Test

data:  PROMFIRST$PRCBE and PROMSEC$PRCBE
t = 1.9559, df = 9, p-value = 0.0822
alternative hypothesis: true mean of differences is not equal to 0
95 percent confidence interval:
 -0.01550127  0.21347989
sample estimates:
 mean of x - y
    0.09898931


       Paired t-Test

data:  PROMFIRST$PRCMA and PROMSEC$PRCMA
t = 3.0383, df = 9, p-value = 0.0141
alternative hypothesis: true mean of differences is not equal to 0
95 percent confidence interval:
 0.02814906 0.19224256
sample estimates:
 mean of x - y
     0.1101958


       Paired t-Test

data:  PROMFIRST$PRCT and PROMSEC$PRCT
t = 2.4875, df = 9, p-value = 0.0346
alternative hypothesis: true mean of differences is not equal to 0
95 percent confidence interval:
 0.009559916 0.201513881
sample estimates:
 mean of x - y
     0.1055369
```

Excepto en la variable RCBE en todas las demas ha disminuido el riesgo o sea en RCMA;RCT;PRCBE;PRCMA;PRCT

Risks table

First session

ID	IRPBE	IRPMA	RBE	RMA	IRPT	RT
1	0.55102041	0.7755102	0.71428571	1	0.66326531	1.71428571
2	0.74857143	0.78285714	0.92	1	0.76571429	1.92
3	0.36190476	0.2952381	0.3	0.06666667	0.32857143	0.36666667
4	0.43877551	0.42346939	0.46428571	0.46428571	0.43112245	0.92857143
5	0.50915751	0.52014652	0.41025641	0.46153846	0.51465201	0.87179487
6	0.58403361	0.72268908	0.76470588	0.88235294	0.65336134	1.64705882
7	0.50738916	0.74876847	0.34482759	0.89655172	0.62807882	1.24137931
8	0.41729323	0.36842105	0.31578947	0.23684211	0.39285714	0.55263158
9	0.2	0.2	0	0.2	0.2	0.2
10	0.54112554	0.54978355	0.54545455	0.63636364	0.54545455	1.18181818

ID	PRCBE	PRCMA	PRCT	RCBE	RCMA	RCT
1	0.45251701	0.39265306	0.42258503	0.34912653	0.31440233	0.33176443
2	0.47702857	0.43131429	0.45417143	0.39852819	0.41037285	0.40445052
3	0.24886349	0.16794921	0.20840635	0.17420344	0.12104308	0.14762326
4	0.30590476	0.29327891	0.29959184	0.13606695	0.16497259	0.15051977
5	0.54539683	0.41348962	0.47944322	0.36290351	0.29587425	0.32938888
6	0.44560224	0.41826331	0.43193277	0.34941602	0.33178936	0.34060269
7	0.40405911	0.48702791	0.44554351	0.29111157	0.35294017	0.32202587
8	0.3286015	0.34015038	0.33437594	0.15470197	0.21873722	0.1867196
9	0.20426667	0.15893333	0.1816	0.10183557	0.38888333	0.24535945
10	0.29142857	0.29373737	0.29258297	0.21074128	0.22179459	0.21626794

Last session

ID	IRPBE	IRPMA	RBE	RMA	IRPT	RT
1	0.19047619	0.19047619	0	0	0.19047619	0
2	0.2406015	0.39849624	0.21052632	0.26315789	0.31954887	0.47368421
3	0.14285714	0.10285714	0.04	0.08	0.12285714	0.12
4	0.31292517	0.21088435	0.23809524	0	0.26190476	0.23809524
5	0.32773109	0.2605042	0.17647059	0	0.29411765	0.17647059
6	0.57142857	0.47004608	0.83870968	0.41935484	0.52073733	1.25806452
7	0.3537415	0.40136054	0.19047619	0.23809524	0.37755102	0.42857143
8	0.33053221	0.33333333	0.11764706	0.03921569	0.33193277	0.15686275
9	0.22142857	0.12857143	0.05	0	0.175	0.05
10	0.26666667	0.41904762	0.23333333	0.26666667	0.34285714	0.5

ID	PRCBE	PRCMA	PRCT	RCBE	RCMA	RCT
1	0.10857143	0.10349206	0.10603175	0.07555556	0.06539683	0.07047619
2	0.11699248	0.1675188	0.14225564	0.04367234	0.09508508	0.06937871
3	0.12097524	0.10134857	0.1111619	0.04588597	0.04016653	0.04302625
4	0.24655238	0.2032	0.22487619	0.13908571	0.09651145	0.11779858
5	0.31231373	0.17113725	0.24172549	0.51121661	0.16152738	0.33637199
6	0.44061444	0.39408909	0.41735177	0.28636198	0.27539911	0.28088054
7	0.40908844	0.38521542	0.39715193	0.28605118	0.24510852	0.26557985
8	0.38791619	0.35139048	0.36965333	0.23955366	0.24691684	0.24323525
9	0.24380952	0.09866667	0.1712381	0.13678135	0.05822732	0.09750434
10	0.3269418	0.31878095	0.31341799	0.23562629	0.20403992	0.21983311

Veamos ahora propiedades

CORRELATIONS PER BLOCK

NOTACION:

promvarbe promedio variables apego bebé en el bloque
promvarma promedio variables mamá en el bloque
promvar promedio variables apego en el bloque
inprom indice promedio en el bloque
cuaribe riesgo cuadrático bebe en el bloque
cuarima riesgo cuadrático mamá en el bloque
curito riesgo cuadrático total

Table Nº9

	promvarbe	promvarma	promvar	inprom	cuaribe	cuarima	curito
GAZING1	0.71	0.56	0.71	-0.66	-0.77	-0.53	-0.72
VOCAL1	0.17	0.27	0.24	-0.16	-0.34	-0.18	-0.28
TOUCHA1	0.80	0.47	0.73	-0.74	-0.73	-0.49	-0.67
TOUCHB1	0.54	0.14	0.40	-0.18	-0.24	-0.08	-0.18
HOLD1	0.66	0.31	0.56	-0.51	-0.39	-0.19	-0.32
AFFECT1	0.46	0.34	0.45	-0.40	-0.42	-0.38	-0.44
PROX1	0.59	0.37	0.55	-0.58	-0.43	-0.49	-0.50
GAZING2	0.59	0.79	0.75	-0.63	-0.71	-0.76	-0.80
VOCAL2	0.47	0.67	0.62	-0.63	-0.56	-0.75	-0.71
TOUCHA2	0.43	0.60	0.56	-0.51	-0.36	-0.52	-0.47
TOUCHB2	-0.17	0.02	-0.09	0.40	0.16	0.37	0.28
HOLD2	0.67	0.54	0.68	-0.65	-0.45	-0.48	-0.50
AFFECT2	-0.07	0.33	0.11	-0.13	-0.06	-0.29	-0.18
PROX2	-0.04	0.30	0.12	0.09	-0.03	-0.01	-0.02
AWP	-0.15	-0.14	-0.16	0.09	0.13	0.03	0.09
ETP	0.08	0.18	0.14	-0.03	-0.16	-0.06	-0.12
HIP	-0.10	0.06	-0.03	-0.02	0.02	-0.00	0.01
ET	0.13	0.21	0.18	-0.08	-0.19	-0.08	-0.15
AW	-0.15	-0.18	-0.18	0.11	0.14	0.04	0.10
HI	-0.12	0.02	-0.06	-0.01	0.06	-0.01	0.03
Poemvarbe	1.00	0.62	0.93	-0.82	-0.84	-0.59	-0.79
Promvarma	0.62	1.00	0.87	-0.66	-0.66	-0.77	-0.77
Promvar	0.93	0.87	1.00	-0.83	-0.85	-0.74	-0.87
Inrieto	-0.82	-0.66	-0.83	1.00	0.84	0.83	0.91
Cuaribe	-0.84	-0.66	-0.85	0.84	1.00	0.69	0.93
Cuarima	-0.59	-0.77	-0.74	0.83	0.69	1.00	0.91
Curito	-0.79	-0.77	-0.87	0.91	0.93	0.91	1.00

Es importsnte ver como Gazing1, gazing2,vocal2, toucha1 se correlacionan en forma importante con los indces definidos
El final del cuadro muestra las correlaciones entre los distintos índices.
Es interesante ver como el indice promedio se correlaciona en forma importante con el índice cuadrático debido esto a que solo el valor 1 dscrimina fuertemente.