

# Assessing Early Memories of Youngsters Born Pre-term: a Follow-up Study

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**Abstract:** This study investigates early memories of birth of youngsters born preterm and, furthermore, it investigates to which extent these memories are correlated with the youngsters' mothers information about the same event. Fifteen youngsters median age 12 years (ranging from 9 to 14 years) are followed up and the youngsters' data presented in this paper are derived from interviews, narratives from a 10-picture-set, pulse rates measurements and a drawing session. The youngsters' mothers are also interviewed, separately, about their children's circumstances of birth.

The overall results indicate no significant correlations between the mothers' and the youngsters' interviews which suggests that there are no transmitted memories of birth in our assessed sample. Few data from the youngsters' interviews are correlated with their own narratives which show little evidence of verbal memories of birth. The results do not indicate a sex effect on the youngsters' performance and they do not give any evidence that physiological responses (measurements of pulse rates) are significantly oscillating throughout the tasks, i.e., these youngsters did not respond differently, in terms of pre-verbal memories, to different stimuli concerning their circumstances of birth. The lack of evidence of pre-verbal (physiological) memory is in line with the result of poor indication of verbal memories of early event as well.

**Zusammenfassung:** *Die Einschätzung von frühen Erinnerungen von Jugendlichen, die Frühgeborene waren: Eine Follow-up-Studie.* Diese Untersuchung erforscht die frühen Erinnerungen von Kindern, die Frühgeburten waren und darüberhinaus wird untersucht, in welchem Ausmaß diese Erinnerungen mit den Angaben der jeweiligen Mutter über das gleiche Ereignis korrelieren. 15 Kinder von im Mittel 12 Jahren (Schwankung zwischen 9 und 14 Jahren) wurden untersucht. Die hier dargestellten Ergebnisse basieren auf Interviews, Erzählungen zu einem Zehn-Bilder-Set, Pulsfrequenzmessungen und einer Sitzung mit Zeichnen. Die Mütter der Kinder werden getrennt ebenso über die Umstände ihrer Kinder befragt.

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Insgesamt ergaben sich keine signifikanten Korrelationen zwischen den Interviews mit den Müttern und den Kindern, was nahelegt, daß keine Erinnerungen an die Geburt in unserer Untersuchungsgruppe vermittelt wurden. Wenige Angaben aus den Interviews mit den Kindern sind mit ihren Erzählungen zu den Bildern korreliert, aus denen sich wenig Evidenz für verbale Erinnerungen an die Geburt ergibt. Die Ergebnisse geben keinen Hinweis auf eine Geschlechtsabhängigkeit. Auch ergab sich kein Hinweis, daß physiologische Reaktionen (Pulsfrequenzmessungen) während der Untersuchungszeit wesentlich schwankten, d. h. die Kinder zeigten keine deutlichen Reaktionen, die man im Sinne von präverbalen Erinnerungen in bezug auf die Geburtsumstände interpretieren könnte. Das Fehlen von Hinweisen auf präverbale (physiologische) Erinnerungen paßt zu den geringen Hinweisen auf verbale Erinnerungen an das frühe Ereignis.

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## **Introduction**

Our memories are the archives of our histories although still remains the question to which extent our memory speaks about facts or represents part of our construction of our own histories. Do I remember what happened to me, do I remember what I think (and believe) that happened to me or what I was told to have happened to me? This controversy point can be even more difficult when one drives the investigation back to a very early time in one's life: his/her birth. In this paper we are particularly interested in discussing how youngsters talk about their own birth and about birth-related situations. More specifically, we are interested in a particular group: a follow-up of youngsters who were born prematurely.

Being born premature and having been treated in the intensive care unit with tubes and ventilators might be a very strong emotional experience: it involves pain, distress and deprivation (Adamson-Macedo and Attree 1994). It might as well account for a diversion in the process of mother-baby attachment. Most of the time there is a gap between what the baby must feel and how they behave since it is common to see "quiet" and "inert" babies in the incubators with breathing and feeding tubes and needles all over their bodies. These babies are capable of experiencing pain from the very beginning of their lives (Porter 1989) which can be observed through endocrine and physiological changes.

Although these experiences are being registered and assimilated to one's personal life this initial painful experiences is more likely to be a silent painful situation. Nevertheless, one would certainly expect these babies to register this experience differently to those babies born healthy and fullterm who can be warmly wrapped and cuddled and attended on their demands. The beginning of the communication and interaction with the external world are dramatically differentiated between babies born premature and those born (healthy) fullterm.

But how much of this initial difficult life is to be remembered by the youngster? List (1986) assures that children remember less information than adults but these information are to be considered accurate ones. Some studies suggest that children's memories can be retrieve from the very beginning of their lives (McDonough and Mandler 1995; McKee and Squire 1993; Ornstein, Gordon and Larus 1992; Goodman, Rudy, Bottoms and Aman 1990) and, furthermore, the retrieval of early memories activates both verbal and non-verbal representations

(Stein, Trabasso and Liwag 1993). From early age children are able to discriminate different situations which provokes different emotions (Stein, Wade and Liwag 1996). One can always wonder if both positive and negative events happened in early life are likely to be equalled remembered or forgotten. Is a painful event more likely to be kept dissociated from conscious or, conversely, would a painful memory be carried out throughout one's life?

The notion that early memories can be carried out is related to the fact that familial circumstances may account for the perpetuation of some situations. In this respect it is known that parents of preterm babies tend to think of and see their children as being more fragile and vulnerable. In our sample the mothers referred that they were most of the time concerned with their babies' well being and even after their children had been discharged from the intensive/special care and the hospital they (mothers) would still fear for the babies' health. It is very common, therefore, that parents of preterm babies tend to be overprotective and over concerned about their children. Would the preterm babies' later behaviour be a consequence of their early life or a consequence of the interaction (through childhood) with their parents? Or, would all these factors account for the youngsters' development?

The present investigation is concerned with the matter of what are the youngsters' (born preterm) factual memories of their situation of birth and what is the "physiological memories" of the same event. The interest in such investigation relies on the question of whether memories of difficult beginning of life are kept alive, present and interfering in a task in early adolescence (from verbal and/or physiological point of view). We checked how stable or oscillating the youngsters' measurements of pulse rates are along the assessment and, furthermore, if there are any changes, how they are associated with different feelings triggered by the situation of evaluation of birth-related stimuli. Would they talk about their early life in hospital, incubator, deprived from their mother/parent's presence? We also investigated whether the youngsters' verbal responses are associated with the parent's information, i.e., are their verbal memories concerning their birth transmitted by their parents.

## **Method**

### *Sample*

The sample was recruited when these babies were born, between 1979 and 1985, South London, when they were followed up in the intensive care, whilst in the incubators (Macedo 1981, 1984; Adamson-Macedo, Dattani, Wilson and Carvalho 1993). In the current study fifteen mother-youngster dyads from the initial sample are followed up and the sample is constituted of eight boys and seven girls with median age of 12 years (ranging from 9 to 14 years). Their median birthweight is 1.32 kg; four of these babies were born with extremely low birthweight (< 1.0 kg); two of them with very low birthweight (< 1.25 kg) and nine of them with low birthweight (< 2.0 kg). They all were born in two-parents families and details on the sample can be find elsewhere (Macedo 1984). Concerning the mothers, their median age is 41 years (ranging from 30 to 53 years) and their gestational term ranged from 26 to 34 weeks.

### *Procedure*

The mothers are asked to sign a consent form where they read the procedure of the study and authorize their interviews and their children's interviews and narratives to be tape recorded. The mothers' interviews concern the circumstances of pregnancy and labour of that particular child involved in the experiment, which includes objective information (date, weight, measurement, kind of labour, stay in hospital) and subjective evaluation of the situation (how they felt, how they think their babies felt, difficulty and easy times around the birth). The mothers also filled in a questionnaire when similar questions were made. Concerning the youngsters, the data are derived from four instruments:

- 1) An *interview* – they are asked about precise information such as, where and when they were born, their weight and measurement at birth and subjective questions such as, how mum felt around the time of their birth, what kind of baby they were etc.
- 2) A *10-picture-set* is presented and short narratives are expected to be produced about each picture – these pictures involve babies in the incubators with and without tubes/ventilators; healthy babies; babies with and without an adult. In some pictures the baby and/or the adult looks relaxed, contented. Some pictures are ambiguous in the sense that it can be interpreted either as a stressful or non-stressful situation.
- 3) A drawing session – what symbolizes birth.
- 4) Measurements of *pulse rate* – a non-invasive, non-harmful instrument is clipped on the subject's tip finger before, during and after the three above tasks.

The Mental Representation of Birth Coding System (MRB) was developed and previous applied to a pilot study (Attree and Adamson-Macedo 1997). In this study the MRB is used to analyze the narratives produced by the pre-adolescents and adolescents in regards to the 10-picture-set. The narratives are coded and correlated with the other variables from different assessments (mother's and youngsters'). The coding consists of 12 scales for which different ratings should be given and each picture is codified by rating each one of the 12 scales .

- 1 Gender identification
- 2 Identification of adults' feelings
- 3 Identification of baby's feelings
- 4 Identification of the atmosphere of the environment
- 5 Indication of baby's health
- 6 Explanation of the baby's illness
- 7 Outcome of the problem
- 8 Identification of the baby's condition
- 9 Personalization concerning one's own circumstances of birth
- 10 The presence of pain
- 11 Personal appreciation of the pictures
- 12 Concept of prematurity

## Results

The present section presents the results concerning the analyses of nine mother-youngsters dyads and it is going to be presented in different stages: 1) the correlations between both between the mothers' and the youngsters' interviews and between the youngsters' interviews and narratives; 2) considerations on the youngsters' drawing and measurement of pulse rate and 3) considerations of the performance of the narratives.

### *1a) Correlations Between Mothers' and Youngsters' Interviews*

Few correlations were found between the mothers' and the youngsters' interviews, as shown in Table 1 and they did not concern the same questions. This initial finding suggests that the information the youngsters provide in the interview are not knowledge which is transmitted by their mothers i.e., the lack of more significant correlations suggest that the story told the youngsters about the circumstances of their birth is almost completely independent of the story as related by their mothers as presented in their independent interviews.

**Table 1.** Inter-correlations between the variables of the mothers' and the youngsters' interviews

	CWB	CM
MEB	-.6378*	
MOF	-.6075*	
MSBR		.7269**
MS		.6564**
MR		.7017**

2 tailed signif. \* =  $p < 0.05$ , \*\*  $p \leq 0.01$

It is interesting to see that the significant correlations are between two variables from the youngsters' interviews:

1) what they know about their birth weight (CWB) is negatively correlated with the mothers' evaluation of birth (MEB) and mothers' feelings at birth (MOF). The less the youngsters know about their weight at birth a) the more the mothers say the birth was easy and quick and b) the more the mothers avoid mentioning any personal feelings at the time of the youngsters' birth.

2) what they know about their measurement at birth (CM) is positively correlated with the way the mothers saw the babies relaxed (MSBR), with the variable of mother being stressed (MS) and mother being relaxed (MR). The more the youngsters do not know how big they were a) the more the mothers say their babies were almost always relaxed; b) the more the mothers say they were stressed with the medical conditions/treatment of their babies and c) the more the mothers say they were relaxed when their babies were ok.

### *1b) Correlations Between the Youngsters' Interviews and Narratives*

From the youngsters' interviews two variables proved to be significantly correlated with two variables of their own narratives, as shown in Table 2: 1) what

**Table 2.** Inter-correlations between the variables of the youngsters' interviews and narratives

	IAF	IBC
CM	-.6386*	
CWB		.6611**

2 tailed signif. \* =  $p < 0.05$  \*\* =  $p < 0.01$

they know about their weight (CWB) and 2) about their measurement (CM) at birth is correlated with their identification of the adults' feelings (IAF) and with their identification of the babies' condition (IBC). Firstly, a negative correlation is yielded when the more they say in the interview they do not know how big they were at birth the less they mention adults' feelings in the narratives. Secondly, the more they say they do not know their weight at birth the more they do not mention any problem with the babies in the narratives.

These few significant correlations between the youngsters' interviews and narratives suggest that in the projective test where they are asked to produce narratives they are not "reproducing their histories" but, furthermore, they are making up histories where none or very few information are real representations of their histories.

The lack of more significant correlations suggests that the story told by the youngsters about the circumstances of their birth is almost completely independent of the story as related by their mothers as presented in their independent interviews. Interesting that the pre-adolescents/adolescents tended to give the information without informing the source of the information, e.g., I stayed in hospital . . . , I was born early . . . They did not say not to remember the facts but they would say they do not know the facts.

### *2 Considerations on the Youngsters' Drawing and Measurements of Pulse Rates*

The youngsters were asked to draw a picture which would symbolize birth and they would name it or talk about it if they wanted to do so. We had a vast variety of symbolization of birth such as: two subjects drew just a baby, two drew just a mum while two others drew a mum with her baby. A nest and an egg were pictures of two other subjects while three subjects drew a baby with an adult which could either be a doctor or the father or the family. One subject refused to draw and the last four ones drew either a house, a hospital and baby unit, an incubator or a baby being weighted. Based on these drawings we cannot establish a profile of what could possibly be a symbolization of birth for these fifteen youngsters all born premature and all having had their first weeks/months of life in an incubator.

Concerning the measurements of their pulse rates we did not find that such physiological response can, in our study, be taken as an indicator of early memories related to birth. Although there was oscillation of the measurements of the pulse rates before, during and after the tasks these differences were not significant at all. In terms of trend we can say that comparing the measurements before the interview to the ones during the interviews there was a slight increase while there was a slight decrease of the pulse rate after the interview (score even lower than

the one before the interview). Regarding the narratives the measurements during and after the task were lower than the ones before the task. Again, these slight alterations do not constitute any source of information from which one can draw any conclusion.

### *3 The Performance on the Narratives: some Considerations*

As mentioned earlier each subject ( $N = 15$ ) produced 10 narratives and each narrative was coded by using the 12 scale-coding-system. Therefore, for each one of the 12 variables there is 150 scores. Follows some considerations concerning some scales: In scale 1 (gender identification) 53% of the score is in the category of no reference to the baby's gender and 41% indicate that the subjects identify themselves with the babies in the pictures and the narratives are made up using "I was . . . , that's me, etc."

In scale 2 (identification of adult's feelings) 89% does not mention any feelings at all and regarding the identification of the baby's feelings, scale 3, the same percentage was found, i.e., 89% does not mention the baby's feelings. The results of these two scales are in line with the percentage of 99% of no comment at all on the atmosphere of the environment as assessed in scale 4. When it comes to the identification of the baby's health (scale 5) in 70% of the narratives there are no problems mentioned concerning the baby while only 27% mentions that the baby is ill. In the subsequent scales, i.e., scales 6, 7 and 8 as an overall view, the great majority of the narratives does not mention, explain or talk about outcome of problems: there is no problem. In scale 9, 92% does not personalize at all while 46% of the narratives are made up using "I . . . my mother . . ." which is in line with the percentage in the scale of gender identification.

It is interesting to observe that although the subjects say "me, I, my mother" etc., they show no evidence at all of the baby being in any suffering or pain although some of the pictures are clearly showing possible distress situation, incubators, tubes etc. In the interviews most of the subject said they were born premature but in the narrative very few allusion is made to prematurity.

The initial profile of this analyses suggests that these subjects seem to be detached from the situation triggered by the pictures. For some reasons these stimuli did not evoke any physiological or verbal memories of their birth and, furthermore, the stories are made up with a strong deny of the problems shown in most of the pictures.

With caution and restriction one could speculate that the subject's deny of the baby's evident ill situation is due to the youngsters' own attempt to be detached from possible distressing stimuli. The gap in the memory is filled in with a desirable story where no problems exist and no threatening situation is disclosed. Still remains the question whether this is a particular strategy used by the youngsters in order to cope with the difficult beginning of their lives and this ensue should be investigated in further studies.

Conversely, one can also interpret these findings as due to the effect of early TAC-TIC (Touching And Caressing; Tender In Caring) therapy, applied to all two of this sample. One of the aims of the early intervention is to break the pain circle by alleviating distress and promoting comfort, console or relaxation. If this is proved to be true it may be one of the possible causes why these youngsters do not

have internal representation of pain as assessed in our study. This interpretation does not support the notion that the lack of references to the pain is a denial process as we first suggested and further investigation should be carried out to test these different hypotheses.

## **Discussion**

One of the aims of the study was to investigate how much these youngsters know or remember about their difficult time around their birth. We used stimuli which, theoretically, would have triggered both pre-verbal and verbal memories and we also wondered to which extent these memories of early events in life were a transmission of memory: would pre-adolescents/adolescents tell circumstances of their own birth in the same way their mothers did. The current study does not corroborate such notion and the results of this preliminary study indicates that through the youngster's interviews one can assure that there is no transmission of memories and they tended to make up their own histories: they did not tell the story in the way their results indicate that through the youngsters's interviews one can assure that there is no transmission of memories and they tended to make up their own histories: they did not tell the story in the way the mothers did. This finding does not corroborate the notion that the mothers' way of telling stories and talking to their kids does account for the way the kids remember the facts (Sink 1988; Fivush 1993). One possible explanation is that this principle does not apply to the situations where the subjects are older, as in our study when they are in their early adolescence.

Similar findings were yielded using the same instruments in a small sample of youngsters born fullterm (Attree and Adamson-Macedo 1997). In that study the authors concluded that there was no evidence of transmitted memory in the youngsters' assessment. The profile of the performance of these youngsters born preterm is in line with the one presented in the investigation of the pilot (full-term) group. These preliminary results lead us to question what is the effect of early tactile stimulation (TAC-TIC) used in the group of premature babies. As we suggested earlier, would these subjects be (later in their childhood) emotionally detached from the situation, as a defense mechanism so they would protect themselves from distressful memories or, conversely, could it be that they really do not have representation of birth as being a difficult, dangerous and painful situation? Would this internal re-definition of the early situation be linked with the therapeutic tactile approach which also aims to alleviate the pain? In a recent paper de Roiste and Bushnell (1995) concluded that the babies stroked (TAC-TIC therapy) before being fed had a "more suitable stomach environment for digestion" (p. 61). Could one speculate that early TAC-TIC stimulation also accounts for the youngsters' positive representation of birth? If so, such method of early intervention would account for the babies' growth and better motor and cognitive development (Macedo 1984; Adamson-Macedo et al. 1993), early in life, and the positive (emotional) consequences would be carried out through adolescence as assessed and interpreted in our study.

Conversely, we inferred that the 10-picture-set can be used as an emotional cue and it did trigger different emotions during the assessment which could not be



retrieved by a direct approach in the interview. This result corroborates previous study (Liwag and Stein 1995) where it is said that emotional situation should be retrieved by using emotional cues. In our study even the most dramatic picture where one can see a tiny baby in the incubator with tubes in his/her mouth would not trigger any feelings expressed in comments which would involve preoccupation, distress or concern. This aspect of the investigation merits further attention: in the pilot (fullterm) group the youngsters identified more openly the dangerous situation in the picture. This difference between fullterm and preterm youngsters corroborates the question to which extent early (painful) memories of incubators are denied and dissociated from the preterm group's memories.

The results of measurements of pulse rates as well as a drawing concerning symbolization of birth have not proved to be significant. These instruments did not provide enough evidence to draw a profile of the youngsters' performance either because of lack of significance (pulse rate measurements) or due to the wide spread categories of answers concerning symbolization of birth. On the other hand, this late findings suggest that although the sample had similar early experiences (low birthweight, incubator, deprivation) each one in the sample, by the end of the childhood, has his/her own way of feeling/symbolizing birth.

It would be interesting, for further study, to investigate different situations which may account for differences in these particular symbolizations: the effect of the familial structure and emotional/social support on the development of preterm babies in terms of the way they know and remember their specific circumstances of birth. These peculiarities, however, are not affected by gender differences as were not any of the other variables investigated in our study.

To conclude, our results indicate that the youngsters born preterm did not remember their early traumatic beginning of life as assessed in this study. They constructed situations and memories which were not transmitted by their mothers whose memories are marked with strong feelings of fear and threatening that these babies would never survive. The youngsters' massive denial of the distressful and potentially dangerous situation shown in the pictures in the task, however, suggest that the initial pain and risk of life is not something to be openly talked about. Further investigation on this issue maybe will enable us to understand how these youngsters dealt with their early threatening physical and emotional experiences, and which role, if any tactile interventions accounts for it.

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