

4. The importance of early mother-infant interactional studies for child psychiatry

Abstract

This chapter discusses the importance and meaning of early mother-infant interaction and their possible connection with developmental psychopathology and child psychiatric practice. The first part presents the impressive effects of early holding behavior by the mother. Secondly, the positive long-term effects of extended contact after delivery are discussed. Thirdly, a case study on autism demonstrates that communication between parents and the medical system is non-optimal. Fourthly, the results of a longitudinal epidemiological study demonstrate that early risks may be long-term risks.

Introduction

Mother-infant interactions have been evaluated in different settings and circumstances. Various factors are known to influence early maternal holding behavior. Left- or right-preference may have long-term relationships with other developmental processes and the child also contributes its own input. Very early

postnatal interaction between the infant and parents is of great importance.

Over the last few decades, hospital personnel have been trained to provide high-quality physical care both to the mother and her infant, but relatively little attention has been paid to the importance of the neonatal period for the development of the unique parent-infant relationship. Many routines on our neonatal and maternity wards, such as separation, were introduced to prevent infection and to improve the treatment of the newborn. Although it was soon recognized that this approach had an adverse influence on the mother-infant relationship, today many parents still encounter difficulties in gaining full physical and mental access to their newborns, especially if these newborns are premature or sick. In an experimental study, efforts were made to keep the mother and infant together immediately after delivery. Correlations were found between the early interactional behavioral circumstances and later outcome measures, such as parental attitudes towards child-rearing practices, family planning, the solving of conflicts with the child, and aspects of child development and measures of psychological arousal in children.

Various clinical case studies demonstrate the difficulties of making a correct and quick diagnosis. In our experience information from the earliest interactive encounters between the child and its family is extremely valuable. We analyzed video-tapes of the early behavior of a patient and her family. The results enabled us to arrive at a sound diagnostic conclusion.

A review of the results of a 30-year follow-up study on very young infants who were treated at Child Guidance Clin-

ics before the age of three years showed that in the long run, the effects of treatments at Child Guidance Clinics did not correlate with more favorable later development and socially acceptable positions in society.

Infant and maternal capacity

Newborns can stretch out their arms and by so doing send a message to the environment. During the first few hours post-partum they become able to do many other things. After being put on the maternal abdomen, they are for instance capable of moving upwards to the nipple in order to suckle. About thirty percent of healthy full-term newborns actually reach this goal within one to one-and-a-half hours post-partum, while the majority are capable of partly fulfilling this task (Rigardt & Alade, 1990; Widström, Wahlberg & Matthiesen, 1990). This sequence of behavior that results in rooting is well-known in mammals and is most probably of survival value for the offspring. In response to this infant behavior the mother will most likely pick up the baby. Anticipatory behavior and pre-programming of the mother guarantee that this process will be completed. During pregnancy, maternal preparation for this process is sensitized and practiced. In addition, early experiences from the mother's own childhood and her relationship with her parents contribute to this process (Nilsson & Almgren, 1970; Uddenberg, 1974).

Studies on healthy women's perinatal emotional adjustment have shown that psychiatric symptoms and conflicts are correlated with the woman's prenatal social circumstances, personal relation-

ships, psychological background and conditions during childhood and adolescence. These factors also influence the way in which parents prepare for parenthood, have their baby and respond to its signals. An example of this part of the developing anticipatory process can be observed in a new mother's interactive behavior with her infant and the high correlations with earlier beliefs and fantasies about the baby.

To further illustrate this point, maternal holding behavior can be used as an example. About 80% of mothers at hospitals with rooming-in care hold their babies on their left arm while sitting, irrespective of left or right handedness and a number of other factors (De Château, 1976). One month prior to delivery, primigravidae with normal pregnancies were interviewed during a routine antenatal visit to the hospital (De Château, Mäki & Nyberg, 1982). All the infants were delivered healthy and at term. During the first postnatal week, the way a mother held her newborn was studied. The mothers who held their babies on their left arm were better prepared for delivery and having a baby, perceived bodily changes differently, expressed the desire to return to work sooner after parturition and were married to or living with more highly educated men than the right-holding mothers. These results suggest that one month before delivery, the mothers who later appeared to hold their infant on the left side, differed in certain respects from the mothers who later held their baby on the right side during the first postnatal week. From other studies it is known that the proportion of mothers who hold their baby on the right is higher after the mother and infant have been separated, which suggests that perinatal maternal

anxiety and uncertainty influence maternal behavior (De Château, Holmberg & Winberg, 1978; Salk, 1970). In addition, more right-holding mothers reported that during their stay on the maternity ward, it had taken them longer to relate to and accept their feelings towards the growing fetus or newborn than left-holding mothers. A follow-up study three years after delivery showed that both primiparous and multiparous right-holding mothers had more frequent contact with a child health center and received significantly more home visits from the health care nurses during the follow-up period. Two explanations have been offered for the preference for holding an infant on a particular side. Salk (1960, 1970) discussed the influence of the maternal heartbeat as an imprinting stimulant that has a soothing effect on the infant, while Weiland and Sperber (1970) postulated that preference for holding a baby on the left arm serves primarily to relieve anxiety in the adult carrier. Results of our own studies support these two hypotheses. However, the infant may also play a key role in molding maternal behavior patterns. An infant's response to stimulation with sound, light and touch, has proven to be asymmetrical under certain conditions. Correlations exist between the initial head-turning response of infants two days postpartum and maternal holding preference two to three weeks later (Ginsberg, Fling, Hope, Musgrove & Andrews, 1979). This could imply that right-holding is appropriate in normal newborns that show left-side preference in their behavior responses. In sick, premature and/or separated newborns, deviation could be a sign of disturbed neonatal behavior, because the percentage that show

right-turning responses to stimuli is higher.

Meshing of the mother-infant dyad reflects the inborn or imprinted capacities of both individuals. A number of studies have addressed the reactive capacity of the newborn and its influence on the environment. Bowlby stated that infant's smiling, crying, clinging, sucking and following are activities that may produce and facilitate maternal behavior; the behavior is intended to achieve attachment and maternal care. Although some authors (De Château, 1976) are critical of Bowlby's explanation for all five types of infant behavior, i.e., to bring about proximity of the mother and result in their mutual attachment, they all agree that smiling plays a role in the growing mother-infant relationship. Infant crying may have different causes and be seen as a way of communicating with the adult. Using spectrographic analysis, Wasz-Höckert, Lind, Vuorenkoski, Partanen and Valanné (1968) were able to identify four types of infant cry in the neonatal period: the birth-cry, the hunger-cry, the pain-cry and the pleasure-cry. These different types of cry may be specific signals to the mother with the intention of producing a specific response. In lactating primiparous mothers, the hunger-cry caused an increase in the temperature of the breasts. Experience seems to influence the level of this reaction: the longer the mothers had listened to their own infant's crying, the higher their skin temperature became. Some mothers showed a weak reaction, while others showed a strong one.

Blauvelt and McKenna (1968) studied infants' special capacity to respond to the environment provided by their mothers. Tactile stimulation of an infant's face

from the ears to the lips resulted in turning of the infant's face towards the mother. This head turning and orienting towards the mother's face might stimulate maternal care. Turkewitz, Moreau and Birch (1968) noted that normal infants were more responsive to stimulation in the right perioral region than in the left. As described above, an infant's preference for turning to the right and looking to the right may be a species-specific adaptation to maternal holding on the left. By looking and turning to the right, the baby can see its mother. On the other hand, an infant's preference for looking and turning to the right could also be a signal in favor of being held in the left arm.

Infant adaptive behavior is highly suitable for the creation of a representational world of this sort, as described by Lebovici (1995). In a similar way to the feeding situation, the holding situation may encompass repetitive elements that are necessary for the development of mental representations and a sense of "self". After birth, the infant gradually learns to appreciate its mother and this becomes more specific the more the infant is exposed to her. Symptoms of distress during feeding by care providers other than the mother may partly be explained by this observation. In many clinical cases of feeding problems in adolescents (anorexia, bulimia), a thorough anamnestic interview will often reveal a history of very early feeding difficulties. Either the infant was difficult in the neonatal period or interaction during early feeding sessions did not proceed smoothly. The clinical importance of this observation is clear.

Correlations between early mother-infant interactional patterns and later development

Primiparous mothers and their infants (N=22) who had had an extra 15-20 minutes skin-to-skin and suckling contact (P+) during the first hour after delivery displayed different behavior, breast-fed their infants several months longer and expressed different opinions about child rearing practices during follow-up at 36 hours, 3 and 12 months compared to a control group (P) of infants (N=20) who received routine care immediately after birth (De Château, 1976). The results of a three-year follow-up study on these mother-infant pairs are presented below. Details of the allocation procedure, basic conditions, selection procedures and methods have been published elsewhere (De Château, 1976; De Château & Wiberg, 1977a, 1977b, 1984). At three-years follow-up, the mothers and children were invited to spend a day at the hospital. The evaluation procedure included questionnaires, interviews, developmental screening, measurement of hormone levels and analysis of video-tapes of the mothers and children during free play (Wiberg, Humble & De Château, 1989).

The *questionnaires and interviews* revealed only a few differences between the mothers in the two groups. When asked in retrospect about the period immediately after delivery, a large proportion of the mothers in the routine care group had experienced the time with their infant as insufficient. Very few mothers in the extra contact group expressed this opinion. This was the only significant difference between the mothers in the two groups. Trends were found on the following issues: Although actual care

facilities for the children and time spent outside the home were almost identical in the two groups, a larger proportion of the mothers in the routine care group expressed the wish to spend more time with their three-year old child. Twice as many siblings had been born in the extra contact group during the three-year follow-up period; the spacing between the siblings was somewhat shorter in the routine care families ($M = 26.3$ vs. $M = 28.1$ months). The number of ongoing pregnancies at the time of follow-up was the same (four) in each group.

Two significant differences were found between the two groups the children. The extra contact children had become stubborn at a younger age than the children in the routine care group. A larger proportion of the extra contact children were continent during the day at 18 months. Language development, measured in term of success in mastering two-word sentences at the age of 18 months, seemed to have been a little faster in the extra contact children, especially the boys.

The following results support those presented above, but were not significant:

A higher proportion of the children in the extra contact group (P + group: $N = 6$ and P group: $N = 3$) slept through the night, while relatively more children in the routine care group (P group: $N = 9$ and P+ group: $N = 5$) woke up at night. Transitional objects were used equally by the children in the two groups (P group: $N = 12$ and P+ group: $N = 12$).

Demographic characteristics were similar in the two groups, e.g., parental occupation, satisfaction with employment, time-off because of illness. Day-care and other child care arrangements were almost identical. The general health

and the number of visits to hospitals and baby clinics were also similar in the two groups.

The results of the *Denver Developmental Screening Test (DDST)* are classified into the following three categories: normal, questionable and abnormal. The data showed a normal age distribution and there were no differences between the two groups as a whole or between boys and girls. None of the children had a delay in psychomotor development. Efforts were made to test the children alone, but in about half of the cases one of the parents was present. Twice as many boys ($N = 10$) as girls ($N = 5$) were accompanied by a parent. The proportions were similar in the two groups.

Table 1 shows the mean *adrenaline and noradrenaline excretion values* in the two groups of boys and girls, mothers and fathers during mother-child play, separation, lunch and rest in the hospital. The traveling time to the hospital and the means of transportation differed between families. Therefore only measurements obtained at noon, 1.00 p.m. and 3.30 p.m. were used. Catecholamine excretion rates per kg body weight and per minute were about twice as high in the children as in the parents. Analyses of variance for repeated measurements were performed and revealed that the difference in noradrenaline excretion between the routine care and extra contact mothers was significant, $F_{1,16} = 4.71$, $p < 0.05$. However, as the data of several subjects were missing, the number of subjects in the ANOVA was small. Therefore paired t-tests were also performed.

Table 1. Means of adrenaline and noradrenaline excretion during different conditions at hospital follow-up

Time of day		12.00 noon				1.00 p.m.				3.30 p.m.			
		P group		P+ group		P group		P+ group		P group		P+ group	
		M	n	M	n	M	n	M	n	M	n	M	n
Adrenaline excretion (pmol/min/kg)	Girls	0.97	4	1.23	7	1.08	3	0.96	9	1.08	3	1.23	6
	Boys	1.86	6	1.58	7	1.04	7	1.67	7	0.94	8	1.73	7*
	Mothers	0.72	10	0.71	13	0.38	11	0.64	18*	0.63	14	0.94	14
	Fathers	0.87	10	0.82	12	0.62	10	0.53	13	0.71	13	0.59	13
Noradrenaline excretion (pmol/min/kg)	Girls	4.74	4	3.67	7	3.32	3	4.41	9	4.88	3	4.29	6
	Boys	5.48	6	4.59	6	4.90	7	5.74	9	3.54	8	5.44	7*
	Mothers	2.01	10	2.55	13	2.04	11	3.08	18*	2.24	14	3.32	14*
	Fathers	2.36	10	1.89	12	2.11	10	1.95	13	1.78	13	1.87	13

From: Wiberg, Humble & De Chateau, 1989

P (P+) = primiparous mothers and their infants given routine care (extra contact) after delivery.
M= mean value. * = $p < 0.05$. t-test

A trend was found that the extra contact mothers and the extra contact boys excreted more adrenaline and noradrenaline. There was no significant difference in cortisol excretion between the two groups.

In the *quantitative analysis of mother and child behavior*, no significant difference was found between the two groups (routine care vs. extra contact) as a whole (chi-square test), but the following trends were noticed: Mothers in the extra contact group smiled/laughed and touched their infants more actively than the mothers in the routine care group. Children in the extra contact group smiled/laughed more

towards their mother and were also sitting further away from her than the children in the routine care group.

A within-group comparison based on the gender of the child revealed the following: Extra contact girls touched their mother more than the extra contact boys did. Routine care girls looked significantly more often at their mothers ($p < 0.05$) and they also smiled and laughed more often than the boys did. Mothers in the routine care group looked more frequently at their daughter than at their son. Extra contact mothers with boys smiled/laughed more often than routine care mothers with boys.

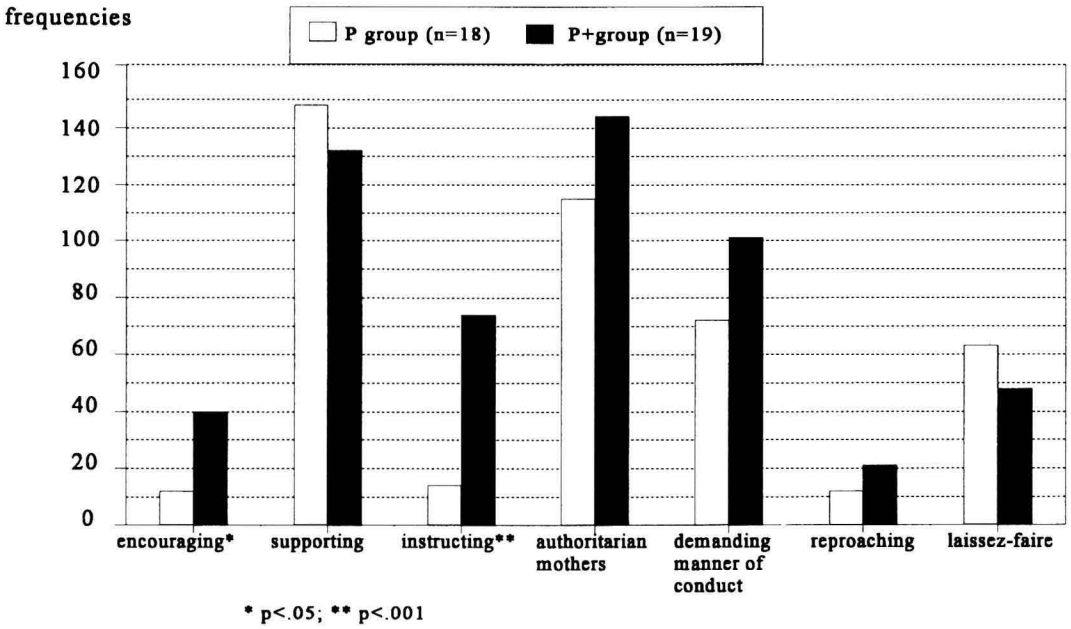


Fig. 1. Results of the qualitative analysis of the mothers' interactive behavior during free play. P (P+) = primiparous mothers and routine care infants (extra contact) after delivery (from Wiberg, Humble & De Château, 1989).

In the *qualitative analysis of mother-child interaction* two significant differences were found between the routine care and extra contact groups (Fig. 1). The extra contact mothers gave more encouragement and instructions to their children than the routine care mothers did. Small trends were noticed that the extra contact mothers were somewhat more authoritarian and demanding than the routine care mothers. The opposite was found for support and laissez-faire behavior. The children's conduct was comparable in the two groups.

The *emotional climate* during interaction was assessed on a five-point scale. The mean value in the extra contact group was 3.4, while in the routine care group it was 3.3. The extra contact girls

and their mothers had the highest mean value (3.6). Verbal communication type was measured in four categories. Monologue by the child, parallel monologue and maternal one-way communication were observed with the same frequency in the two groups; the latter was more common in the mothers with boys. Dialogues between mother and child were somewhat more common in the extra contact group. Level of play was similar in the two groups. Four out of the eleven boys in the extra contact group displayed the highest level of play, i.e., role-playing. Only one out of the eleven routine care boys was judged to have achieved the same level of play.

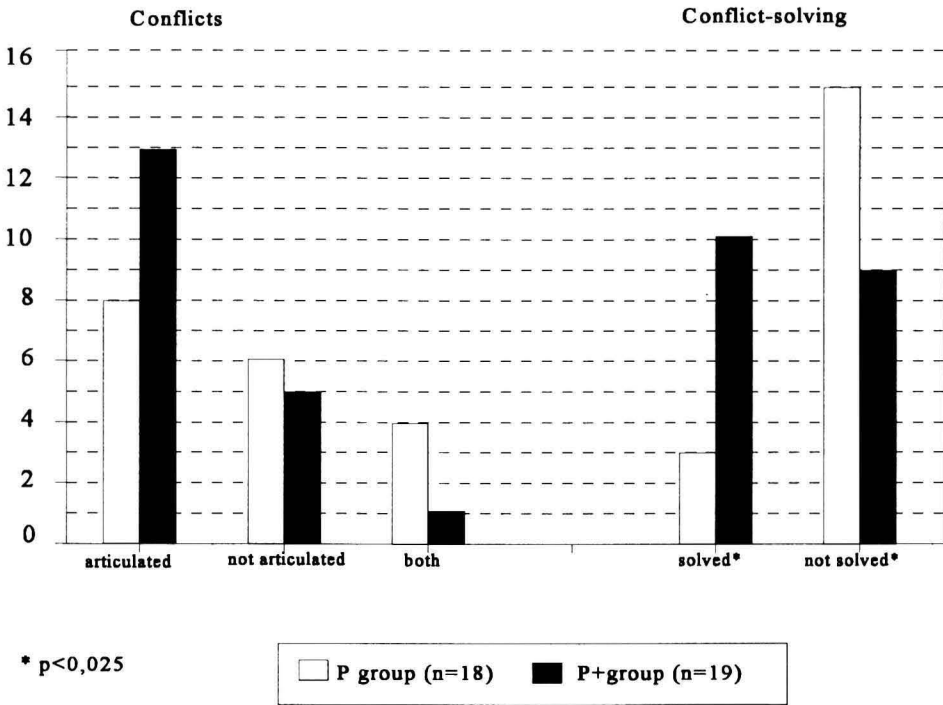


Fig. 2. Results of the analysis of conflicts during mother and child free play. P (P+) = primiparous mothers and routine care infants (extra contact) after delivery (from Wiberg, Humble & De Chateau, 1989).

Conflicts arose in all the mother-child dyads, with the exception of one mother-daughter pair in the extra contact group. Conflicts appeared at approximately the same time in all the dyads in the two groups. In the routine care group, conflicts arose after a mean of 14.7 minutes on the videotape, while in the extra contact group this occurred after a mean of 12.8 minutes. Articulated conflicts were more common in the extra contact group (Fig. 2). Regardless of the type of conflict, significantly more conflicts were solved in the extra contact group. Six out of the eleven extra contact mother-son dyads solved their conflicts in contrast

with two out of the eleven routine care mother-son pairs.

Perhaps the most interesting results were connected with hormone analysis. Our results confirmed previous findings that adrenaline and noradrenaline excretion are sensitive measures of psychological arousal in children as well as in adults (Lundberg, De Chateau, Winberg & Frankenhaeser, 1981).

It is of special interest to note that although the absolute levels of catecholamine excretion per kg body weight differed between the children and adults, the magnitude of the response was almost identical. Urinary levels of catecholamines seem to provide a useful in-

dex of psychological arousal in young children, but direct levels of subjective intensity may be difficult to measure. This study also compared the urinary excretion levels of adrenaline and noradrenaline in the children and their parents under different conditions at the hospital follow-up. The only consistent pattern seemed to be a somewhat higher catecholamine level in the extra contact mothers compared to the routine care mothers. A similar but weaker relationship was found for boys. The difference in catecholamine excretion between the two groups increased during the day. This covaried with increasing stress and was most obvious after the video-taping of the mother and child at play. The level of stress expressed by the increase in catecholamine excretion was highly correlated with the nature of the conflicts that were observed during the free-play session. In the extra contact group, more articulated verbal conflicts arose (see Figure 2) than in the routine care group. The excretion of catecholamines in the former group was significantly higher during that sampling period and the next one. The general trend in the extra contact group during the day at the hospital was an increase in catecholamine excretion in the mothers and boys, but a smaller increase in the girls. This was not the case in the routine care group. During the free-play session, mother-child interaction in the extra contact group was characterized by maternal encouraging and instructing behavior. In the routine care group, the mothers tended to be less demanding and displayed more *laissez-faire* behavior (see Figure 1). These findings are in agreement with the results of previous studies in which stress was induced by achievements tasks. The extra

contact mothers excreted more catecholamines and were more demanding, gave more instructions and encouragement and thus created an atmosphere in which their children, especially the boys, would perform better. The sex differences observed in these children are consistent with those found in other studies on adults and children.

The results of this study support our earlier notion that early mother-infant contact can influence the development of the mother-child relationship in several respects, also on a more long-term basis.

Clinical case study

Autistic disorder (AD) is presently considered to be a developmental disability with multiple, but usually unknown, biologically-based etiologies. It is characterized by cognitive, communicative and social deficits. Language retardation is an almost invariable feature of AD and is generally the primary reason for a psychiatric examination. So far there have been few systematic studies on preverbal vocalizations in autistic children. However, clinical observations and parental reports suggest that in such children, the development of babbling is usually delayed and in some children, it may be reduced in amount and deviant in quality (Ricks, 1972; Rutter, Bartak & Newman, 1971). In the youngest age groups, language impairment is especially notable and, apart from IQ, it has proven to be the best predictor of the later psychosocial outcome in autistic children. Capute et al. (1986) showed that the early attainment of language milestones is predictive of cognition in infancy. Massie and Rosenthal

(1984) and Adrien et al. (1990) demonstrated the value of home videos for studying the early behavior of children who are later diagnosed as being autistic. We briefly present one of our patients as a case study.

Our patient (R) was videotaped by her parents several times from birth to 14 months of age (Eriksson & De Chateau, 1992). When she was referred to our clinic at the age of 2 years and 7 months, videotaping was continued in order to further document this case. R is the second child in the family. She was born after a normal pregnancy and delivered at 42 weeks of gestation with normal Apgar scores. Her birth weight was 5,390 grams, length 57 cm and head circumference 36 cm. Her mother's blood-glucose levels were checked during pregnancy and found to be within the normal range. The parents and the older brother are tall. Their development was normal. According to the parents, R developed normally during the first year. Her communicative behavior was also normal. She smiled, laughed, babbled and played peek-a-boo. She played with toys in an age-appropriate manner. At 12-13 months, the parents first noticed that R was losing interest in her surroundings. As yet there was no indication of R having any disorders.

We could confirm the child's history reported by the parents by looking at the video-tapes. At 8 months R waved good-bye and played peek-a-boo. At 11-12 months of age she walked without support. She babbled in an age-appropriate way with reduplicated syllables; played with a car, ate well, pointed at objects when asked. At 13 months of age she was very quiet and hardly used any language at all. She was less active in her play, sat on the floor and played with a book in a

stereotyped repetitive way. R seemed more withdrawn and showed little interest when the parents called her name. When R was 2 years old, her mother told the doctor at the Child Health Clinic that her speech was delayed. R was referred to our hospital at 2.7 years of age. She then showed all the symptoms of AD according to the DSM-III-R criteria (American Psychiatric Association, 1987). She was withdrawn and preoccupied with rocking or spinning her mother's hair. She showed no interest in other people or playthings. She did not utter any words but only monotonous sounds, except for some phrases from a children's song. Our examination revealed that R's gross motor development corresponded with 2.2 years of age, her fine motor skills with 1 year and her mental development, measured using the Griffith scale, with 1.6 years of age. The somatic examination, CT scan, MRI and EEG were all normal. Metabolic screening was normal. Screening for infections known to affect the brain was negative and her brain stem audiometry was normal.

The video-tapes from 11-12 months and from 31 months were analyzed by two independent observers using the Childhood Autism Rating Scale (CARS; Schopler, Reichler, DeVellis & Daly, 1980). At 12 months, R's score was 15-15.5 points, which represents nonautistic behavior. In contrast with this observation, her score on the CARS at 31 months was 48.5-49 points, which reflected the typical behavior of an autistic child (>30 points = AD).

The video-tapes recorded by the parents were sometimes of poor quality, but clear enough to observe the quality of R's development. The quantity of different types of communicative behavior could

not be estimated, because the video-tapes showed only short sequences of R's behavior. Although R seemed to have developed normally during her first year without any delays, she became withdrawn in a period of only a few months, without any obvious medical or biological reason. At 10 year of age, her score on the CARS was normal and, although her autistic symptoms could be detected on the video-tape, her mother had not spotted this until her child was 2.3 years old. In R's record from the Child Health Clinic only a tendency towards strabismus was noted. The video-tapes provided us with a unique opportunity to study her preverbal communicative behavior. Her stages of speech development during the first year were normal. At 13 months, her preverbal vocalization was deviant in both quality and quantity as described earlier.

This case report is interesting because the video-tapes enabled us to confirm the parents' report that R had developed normally during her first year. It also showed us that if communicative screening tests had been used routinely at the Child Health Clinic, R's divergent and peculiar behavior would have been noted at a much earlier stage and she and her family would most probably have received adequate help at that time. This case report also showed that as early as at 12 months of age, the parents noted aberrant behavior in their infant. Earlier normal interaction and attachment behavior had changed, leaving the parents confused and worried. Obviously the parents had drawn the correct conclusion from their observations. These suspicions were later confirmed by the development of a full-blown autistic disorder.

Long-term psychiatric follow-up from infancy to adulthood

During the period 1953-1955, a total of 2364 children aged 0-18 years were discharged from the Child Guidance Clinic (CGC) in Stockholm. A subgroup of 125 infants (68 boys, 57 girls), who represented 5.2% of the primary group, were under the age of 3 years at the time of discharge. Thirty years later, a follow-up study was conducted on these individuals by examining official registers. The parents had all consulted the CGC because they had been experiencing problems with their children. However, many of the parents showed psychiatric symptoms themselves (Curman & Nylander, 1975, 1976; De Château, 1993). The infants' and parents' psychiatric diagnoses and treatment during initial contact with the CGC are summarized in Table 2.

Seventy-seven percent of the infants were judged to have normal mental health or to display mild environmental reactions. Behavioral disorders, mental retardation and psychosomatic diseases accounted for 23% of the diagnoses. The distribution of the diagnoses among the sexes was almost identical, with the exception of mental retardation, for which the sex ratio was nine boys to one girl. The parents showed a greater preponderance of mental disturbances than the infants. In 41% of the families, mental disturbances were present in a slightly higher proportion of the families with boys.

The parents who consulted the CGC reported an average of 2.4 symptoms per infant. The most common symptoms were insomnia, aggressive behavior, eating disorders, separation anxiety and hyperactivity. Half of the infants were

treated for less than 6 months, while the other half received treatment that lasted for more than 6 months (Table 2). In 21 cases (17%) the infant was placed in foster care or in an institution. The parents agreed with this decision in somewhat less than half of these cases. Fourteen of these infants were boys.

During follow-up 30 years after discharge, the following sources of information were used: registers kept by child and adolescent psychiatric care clinics or centers and mental hospitals for inpatients; the Social Welfare Board Register (Social Register); the Register of Criminal Offenses (Criminal Register); the National Board of Excise Register, the Temperance Board

Register (Temperance Board) and the National Social Insurance Board Register (Insurance Board).

Seventy-five out of the 125 infants (60%) who were discharged from the CGC between 1953 and 1955 appeared in one of the five registers used for follow-up 30 years later. This proportion was similar to that in the whole group of 2364 children aged 0-18 years (62.9%, $p = .4$; n.s.).

Records were found most commonly in two of the registers, those kept by the psychiatric clinics and the Social Welfare Board, but many of the patients appeared in more than one of the registers during the follow-up period (Tables 3 and 4).

Table 2. Infant and parental psychiatric diagnoses and treatment at the Child Guidance Clinics from 1953 to 1955

	Boys (n = 68)	Girls (n = 57)	Total (N = 125)
Infant diagnosis			
Healthy	18 (26%)	11 (18%)	29 (23%)
Mild environmental reactions	32 (45%)	36 (63%)	68 (54%)
Behavior disorder	6 (9%)	9 (15%)	15 (12%)
Mental retardation	9 (13%)	1 (2%)	10 (8%)
Psychosomatic disease	3 (4%)	1 (2%)	4 (3%)
Parental diagnosis			
Neurosis	28 (41%)	18 (26%)	46 (37%)
Psychiatric illness	2 (3%)	0 (0%)	2 (2%)
Mental retardation	3 (4%)	0 (0%)	3 (2%)
Maternal diagnosis	21 (31%)	13 (19%)	34 (27%)
Paternal diagnosis	12 (18%)	6 (9%)	18 (14%)
Contact/treatment			
Shorter than 6 months	34 (50%)	30 (53%)	64 (51%)
Longer than 6 months	34 (50%)	27 (47%)	61 (49%)
Compulsory placement	7 (10%)	5 (7%)	12 (10%)
Voluntary placement	7 (10%)	2 (3%)	9 (7%)

Table 3. Number of patients in different registers during the follow-up period

	Boys (<i>n</i> = 68)	Girls (<i>n</i> = 57)	Total (<i>N</i> = 125)
Psychiatric Institution	29 (43%)	24 (42%)	53 (42%)
Social Welfare Board	36 (53%)	20 (35%)	56 (45%)
Criminal Register	13 (19%)	2 (4%)	15 (12%)
Temperance Board	13 (19%)	2 (4%)	15 (12%)
Insurance Board	4 (6%)	2 (4%)	6 (4%)

Table 4. Number of patients on various registers during the follow-up period

	Boys (<i>n</i> = 68)	Girls (<i>n</i> = 57)	Total (<i>N</i> = 125)
In one register	21 (31%)	17 (30%)	38 (30%)
In two registers	9 (13%)	7 (12%)	16 (13%)
In three registers	16 (24%)	4 (7%)	20 (16%)
In four registers	1 (1%)	0 (0%)	1 (1%)
Total	47 (69%)	28 (49%)	75 (60%)

Twenty-nine infants (23%) were suffering from behavioral disturbances, mental or psychosomatic diseases. At follow-up, the 10 patients (8%) with mental retardation all had the same diagnosis and were therefore excluded from this part of the analysis of psychiatric symptoms. More of the females who had a psychiatric diagnosis during infancy sought psychiatric help as adults than the males with a similar diagnosis. In the mentally normal infants, the proportions were similar. A total of 55% of the individuals who appeared in the register(s) had a parent with a mental deficiency. This was found in only 21% of the non-registered infants ($\chi^2=6.1$; $p \leq 0.01$). More boys (48%) than girls (26%) had a parent with a mental

deficiency ($\chi^2=7.8$; $p \leq 0.005$). Table 2 shows that 51 out of the 125 infants had either one or two parents with a psychiatric diagnosis. At follow-up, 43 of these individuals were identified in one or several of the registers, as opposed to 32 out of the 74 in whom this factor was lacking ($\chi^2=21.2$; $p \leq 0.01$). Both the parents of eight individuals had a diagnosis of mental insufficiency. All but one of these parents were judged to be neurotic at the CGC. (The exception, who had a diagnosis of reactive psychosis, was the father of a boy). In six cases, the infant was found to be healthy. Although there were only a few cases, the proportion of individuals noted in one or more registers appeared to be about the same as in the

total group. This suggests that a diagnosis of neurosis in both parents does not have any substantial influence on the long-term outcome.

There were no differences in the number of consultations and treatments given at the CGC or in the duration of consultation and treatment between the sexes. However, after consultation placement outside the home was more common in boys than in girls (21% vs. 12%). Voluntary placement was also relatively more common in the boys. Regardless of the mode of placement, the outcome of the 21 infants placed outside the "biological home" did not differ from that of the total infant group. Of these 21 infants, 62% appeared in one or more of the registers at some point during the follow-up period.

Sixty percent of the youngest patients who were examined at the Stockholm CGC during the 1950s appeared in one or several of the government registers 30 years later. A similar proportion of records was found in a follow-up study on children of 0-18 years of age over the same period of time, using the same technique (De Château & Nylander, in press). The notion that early treatment influences the prognosis in a positive way could therefore not be substantiated by the results of this study. This does not imply that we should not increase our efforts to identify very young individuals who need psychiatric care and treatment. Instead it forces us to critically reflect on our methods and to adjust them in such a way that they become more effective. In this study, the number of subjects who were suffering from a psychiatric illness and needed help from the Social Welfare Bureau was much larger than the number in the general population of a comparable

age in Stockholm (De Château & Nylander, in press). This cohort is unique in many respects (Curman & Nylander, 1976) and therefore no valid control group is available. Inclusion of patients occurred only during a limited period of time. They were discharged either after psychiatric care and treatment had resulted in adequate social adjustment, or because the parents were unwilling to continue attending the CGC. The children in the sample did not display any severe social maladjustments or psychiatric and psychological problems (Curman & Nylander, 1976; De Château, 1990). Seventy-six percent of the sample of infants were considered to be healthy or to have shown mild reactions to their environment at that time by the CGC staff. Nevertheless, our follow-up clearly demonstrated that the outcome was far from encouraging. At the CGC, many of the disorders were judged to be relatively mild and not to pose much threat to the children's mental health and development. The question arises as to whether these judgements were well-founded and whether it may have been possible to detect or foresee all the difficulties and hardships. In the 1950s, it was generally accepted it was very important to refer patients to the CGC during an early stage of their maladjustment. However, children under the age of 3 years constituted only 5% of the total cohort. In our experience, professional help is not sought for children because they are in urgent need of it, but because they are causing serious problems in their environment. If this is true, then it is not surprising that as adults they show such poor social adjustment and have so many other problems and difficulties (De Château, 1991).

Concluding remarks

In the above a number of selected examples are given to illustrate the possible connections between early interactional experiences and later normal or psychopathological development. In a recent review of the relationships between mental disorders in childhood and in adulthood, Rutter (1995) concluded that there is strong and specific continuity of depressive disorders.

Information can also be gathered from studies on risks at birth. In an investigation on neonatal separation, Barnett et al. (1970) allowed a group of mothers to enter the premature baby nursery from the second day after birth and to touch and handle the infant in the incubator. Compared to the mothers without this extra contact, the mothers in the experimental group showed greater commitment to their infants, more confidence in their mothering skills, greater care-providing skills and provided the infant with more stimulation. Leifer et al. (1972) found differences in maternal attachment behavior, smiling and close bodily contact, between mothers of full-term versus pre-term infants. Lower maternal self-confidence (Seashore, 1973) was found in the primiparous mothers who had been separated from their premature infant for 3-12 weeks than in the primiparous mothers who had been permitted to have physical interaction and contact during this period. This difference was not found in multiparous mothers. In a retrospective study, Stern (1973) found that prematurity and separation were strongly correlated with child abuse. In a classical carefully controlled prospective study on 670 infants, Werner et al. (1967) provided evidence that if an infant had suffered some disad-

vantage at birth (e.g., perinatal asphyxia), then poor environmental circumstances reinforced the existing disadvantage, while favorable postnatal social influences compensated for it. In our own studies, right-holding behavior was high in mothers who had been separated from their infant and was also related to more pre- and postnatal anxiety in the relationship with the infant (De Château, Mäki & Nyberg, 1982). Many men and women begin parenthood with feelings of insecurity and low self-confidence about their credibility as prospective parents. The reasons for this are complicated. Frequently, feelings of inadequacy go back to the individual's own early experiences and relationship with his or her own parents. Psychological, medical and social information, as well as support, may neutralize part of this anxiety. However, adjustment to the parental role, sensitivity to the infant's needs and the ability to meet the infant's demands, is probably more emotional-empathic than cognitive (Winberg & De Château, 1982). If men are not as well-prepared in this respect than women, as is indirectly indicated by their behavior, more effort should be made to activate and promote their feelings.

Studies on correlates of early mother-infant interaction generate a number of interesting issues. The relatively short period of extra contact during the first hour after delivery can in itself hardly explain the differences in mother-infant interaction and child behavior later on. During this early contact, however, mother and infant may have had the opportunity to exchange signals which stimulate mother-infant synchrony. Consequently, development of the mother-infant relationship may proceed more

smoothly. Other variables, such as the personality of the mother, family and social background, parental age and health, are possibly of equal importance, as may also be true for the mother's relationship with her husband, her own parents, planning and course of pregnancy, mode of delivery and so on. From a biological point of view, taking care of a newborn child is a delicate matter. The optimal physical condition for the newborn child is characterized by fairly narrow boundaries, which is also the case with regard to many physiological processes. Parents and scientists are not always aware of these boundaries and their importance has not always been carefully observed. There should be no great departures from a new born infant's needs. During the sensitive phase of very early development, these needs are probably best served by patterns of maternal and paternal behavior that for the most part are genetically determined. Perhaps our task should be to provide parents with conditions on our delivery, maternity and neonatal wards that most closely meet their needs and those of their newborn infant.

The conclusion that can be drawn from these studies and its impact on perinatal care is impressive. However, this in itself constitutes a danger. If a new routine is introduced to replace an old one, then its practical application must take place with great sensitivity. Such a change should not be too rigorous, even when there is evidence of a positive implication for perinatal care. Right from the start, infants differ markedly from each other; their families have different capabilities and backgrounds. Any system must be flexible enough to meet the individual requirements of each and every family. The danger of too much gen-

eralization on the basis of contemporary research into mother-infant relationships is not just an illusion.

Our case report gives rise to another important question regarding non-optimal communication between parents and the existing medical system. The parents were convinced of the fact that their little girl had a serious delay in development and emotional interaction at a much earlier stage than the medical establishment. In this way, it took however quite some time to find the right channels through which treatment, support and help could be provided. Delay in correct management is still frequently observed, especially in cases of severely affected young children and this has great bearing on the possibilities for treatment and future development.

The outcome of the longitudinal, prospective follow-up study on a group of former CGC patients did not seem to be very encouraging. A major finding was that the majority of this very young CGC population, with mild adjustment problems, suffered from a number of difficulties later on. Significant predictive factors were the sex of the child and the CGC diagnosis of the parents. These findings were supported by comparable studies on older children (Dahl, 1965; Sundby, Sommarchild & Kreyberg, 1968). The implication of these findings for practical purposes is that even mild or moderate adjustment problems in early infancy may lead to severe maladjustment in adulthood. Evaluation methods during the 1950s may have been less than adequate. Therefore the severity of the diagnoses may not have been correctly interpreted. On the other hand, we believe that diagnostic skills during the initial phase of contact with the CGC were

of good quality. Discrepancies between these two observations are still poorly understood and clearly need more detailed study (De Château, 1991).

Our own experience shows quite clearly that early interactional patterns have a bearing on later development. Correlations between early interactional patterns and the later mother-infant relationship illustrate such a connection. However, little is known about the processes by which such continuity is mediated.

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