

**A case study of parent-child interactions of a child with autistic spectrum disorder (3-48 months) and comparison with typically-developing peers**

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**Abstract**

Early triadic interaction, the reciprocal action between mother-father-child, is described in the family of a girl diagnosed with autistic spectrum disorder (DSM 299.00) and learning difficulties at seven years. By chance, the family participated in a longitudinal study examining triadic interaction in 20 Swedish families using the Lausanne Triadic Play method. Quantitative and qualitative observations were made when the children were 3, 9, 18, and 48 months of age. Compared with the other families, deviation was noted in early triadic synchronization, most clearly when the girl was 9 months old. At 3 months, the girl took more turns and participated in more turn-taking sequences than the other children. However, at 9 months, she gave more attention to objects. At 18 months, she had less eye contact with her parents and less shared focus and at 48 months her language skills were poorly developed. The mother showed more frequent contributions and more frequent turns at the two observations during infancy. The father showed deviations in attention to the child and affirmation at 9 months and negative vocalization at 18 months. These findings are discussed in terms of their importance with regard to early intervention. Assessment of the family interaction using home observations seems to be of special importance.

*Keywords:* early communication, autistic spectrum disorder, triadic interaction, longitudinal prospective study, Lausanne Triadic Play.

## **Introduction**

Autistic spectrum disorders involve difficulties in social relations, including taking part in reciprocal interactions, understanding other people's feelings and points of view. In a recent overview of studies on joint attention and autism Bruinsma *et al.* (2004) focus on the concept of joint attention as "an area that not only helps characterize children with autism, but also is a prognostic indicator and a potential intervention goal" (p.169). Similarly, Osterling *et al.* (2002) found that children with autism performed worse than children in comparison groups in social orienting, joint attention, and attention to another's distress. They suggested that joint attention is one of the "targets for early intervention" (p. 269). Siller and Sigman (2002) reported two major findings from their study on the behaviour of parents of children with autism during play interactions. First, like caregivers of typically developing children, caregivers of children with autism "synchronized their behaviours to their children's attention and activities" (Siller and Sigman, 2002, p. 77). Second, the level of synchronization achieved seemed to be essential to the children's future development of joint attention and language skills. Children with autism whose parents showed higher levels of synchronization developed "superior joint attention and language over a period of 1, 10, and 16 years" (p. 77).

In a prospective longitudinal study using the Lausanne Triadic Play (LTP) (Fivaz-Depeursinge *et al.*, 1996) method to videotape and monitor triadic interaction between newborns from the general population and their parents from the time the children were 3 months old until they were 4 years of age, a girl was later diagnosed with autism. Using the videotapes, the interactions between the girl and her parents have been analyzed and compared to the interactions in the other families.

### *Earlier Studies Using Videotaped Observations*

Massie (1975, 1978) examined home movies of children later diagnosed with childhood psychosis, including infantile autism and typically-developing children. He found group differences in behaviours in the mother-child dyad, especially in eye contact and touch. Children with infantile autism exhibited lower activity levels beginning at 1 month of age and during early infancy they showed avoidance

reactions. Freiburg (1982) described 12 babies from 3 to 18 months of age who had developed avoidant features. The babies rarely or never looked and smiled at their mothers, they seemed to have missed the babbling stage of infancy, and did not start to vocalize. During distress they did not signal to their mothers for comfort. In the case of autism, Freiburg noted that avoidance reactions came to dominate the overall pattern and her hypothesis was that the baby's avoidant reactions might cause the mother, feeling rejected, to curtail her attempts to interact with the baby. Tustin (1995) proposed the hypothesis that the mothers of autistic children might be depressed and that the baby's avoidance of the mother could be a "protective shell" adopted by the baby to protect him or herself from the depression of the mother.

Using time-based microanalytic methods, researchers have identified structures in face-to-face interactions, evidence of the early existence of bidirectional influence of behaviour and mutual regulation of affective communication between mothers and infants (Beebe, Jaffe, Feldstein, Mays and Alyson 1985; Beebe and Lachmann 1988; Cohn and Tronick 1988; Tronick, Als and Brazelton 1977; Tronick and Cohn 1989). By the age of 6 months, infants' emotional expressions are already well organized and are systematically related to environmental events (Weinberg and Tronick 1996). It seems as if children need interaction with at least one parent in order to develop their own self-regulative competence.

Dawson *et al.* (2000) studied early interactions using retrospective parental reports, home videotapes recorded by parents at the child's first birthday party, or clinical descriptions of interaction symptoms of young children suspected of having autism. Their findings included impairments in paying attention to others, affect responsivity, and joint attention behaviours.

Maestro *et al.* (2002), using family home videos, focused on infants' attention during the first 6 months of life. Their findings indicate specific deficits in the ways children with autism respond to social stimuli, as well as an absence of the typical shift in the infant's attention from objects to human beings.

Ricks and Wing (1975) described characteristics of language and other forms of communication in typically developing children and those with autism and suggested that the central problem in early childhood autism is "an impairment of complex symbolic function affecting all forms of communication". According to Wing (1996) the interaction between average infants and their parents is supposed to

consist of two-way communication, in which the infant responds with happiness and excitement. In this way, the parents get positive reinforcement, which strengthens the reciprocal bonds between the parents and the child which is lacking when the child has an autistic spectrum disorder.

Trevarthen et al. (1979, 1998, 2004) suggest that autism is a dysfunction or disturbance in the emotional exchanges that regulate the contact between mother and baby. Average babies are born with a very complex emotional setup and method of functioning in how to regulate communication and contact with other human beings. As this is very delicate and fairly easy to disrupt, the rhythm of interaction and the mother's sensitivity to the infant's cues are critical, forming reciprocal interaction when the different partners in communication adapt to each other's rhythm.

## **Method**

The purpose of the study was to explore the family system and the triad with the overall aim to investigate how communication is established between newborns and their parents. Children and their parents were followed longitudinally and prospectively using videotaped standardized observations of their triadic interactions according to the Lausanne Triadic Play when the children were 3, 9, 16, and 48 months old.

### *Participants*

#### *All Families in the Study*

Midwives at a maternity health care clinic in a Stockholm suburb were asked to give written information about the project to all families visiting the clinic over a 5-week period. Families who spoke Swedish, lived together, and were expecting their first child were invited to participate. In Sweden, maternity health care clinics are visited by almost all expectant parents. Fathers accompany mothers to some of their appointments. Twenty of 22 consecutively informed couples agreed to take part in the study and 20 newborn babies, along with their mothers and fathers, entered the study. Expectant fathers' mean age was 30 years (range 24 to 42), and expectant mothers' mean age was 27 years (range 21 to 32); nine of these men and 10 of these women had completed a college or university education. Five of the men and eight of the women had completed senior high school, and the remaining six men and two women had completed lower or compulsory school.

Nineteen of the 20 men in the sample were of Swedish ethnic and cultural background and one was originally from Australia. Eighteen of the 20 women were of Swedish ethnic or cultural background, one mother was from Finland, and one from Brazil. Twelve of the infants in the present study were boys, and eight were girls. One baby was born 10 weeks prematurely. All of the other babies were born on time and healthy, one via caesarean delivery (Sofie, the infant in this case study).

### *Sofie and Her Family*

Sofie was born after normal pregnancy at week 41. Caesarean section was performed due to labour fatigue. Her parents were Lena, 21 years old (the youngest mother in the group) and Thomas, 24 years old, (the second youngest father in the group). Both parents were working and the pregnancy was planned. The postnatal history (see Appendix) indicates the possibility of a sub clinical “maternal blues”.

Lena and Thomas had an extensive social network and good relations with both families of origin. Thomas’ parents lived in the same city and Lena’s parents lived three hour’s driving distance away.

Because of her slow language and speech development, Sofie was referred to a speech and language therapist at the age of 2.5 years and then to a child psychiatric team. At the age of 4 years she was referred to a specialized child and adolescent psychiatric unit for the assessment of neuropsychiatric disorders. Because of the long waiting list, their assessment did not start until Sofie was 7 years of age.

The child psychiatric assessment, using DSM-criteria, included tests and observations by a psychologist (including Leiter-R, WPPSI-R, and ADOS) a physiotherapist, and a teacher trained in special pedagogy. Sofie had an IQ of 65 and according to DSM system, she was given the Axis I diagnosis 299.00, Autistic Disorder, and the Axis II diagnosis of Mental Retardation. Until the age of 5 years, she was in regular day care, then transferred to specialized day care and from age 7 she attended a school for children with learning disabilities and autistic spectrum disorders.

### **Procedure**

During week 22-25 of pregnancy, the future parents were interviewed using open-ended questions and standardized questionnaires about their family situation, their

health, and their expectations about becoming parents. Follow-up interviews were undertaken when the babies were 4 weeks old.

The quality of the parents' marital relationship was estimated using the ENRICH Marital Inventory (Wadsby 1998) during pregnancy and when the baby was 9 months old. Thomas had a total score of 505 and Lena of 515. In all eleven areas of marital satisfaction they showed a very high congruence with each other, which is considered to be indicative of strength in the relationship. The men in the present study had an average score of 488.3 (standard deviation [SD] = 35.8) and the women had an average score of 495.7 ([SD] = 39.0).

In the LTP setting, the parents and the child are placed in separate seats in a triangle, with the parents' seats oriented toward the baby. During the first year, the infant is placed in a special chair that can be adjusted to three positions, facing toward either parent or in between them. The chair is also adjustable so the baby can sit in a comfortable position. When the family has become used to the setting, the observations begin and are videotaped using two time-synchronized cameras, one facing the parents and one facing the baby. Between the ages of 18 months and 4 years a children's chair is used. The parents are given the following tasks covering the four possible configurations of a triadic relationship:

Task 1: One parent plays with the infant in the presence of the other parent.

Task 2: The parents switch roles.

Task 3: Both parents play with the infant.

Task 4: The parents interact only with each other in the presence of the infant.

One week after each Lausanne Triadic Play assessment in the studio (at 3, 9, 18 and 48 months), a home visit was made to assess the families' patterns of behaviour in their homes. The parents were instructed to place the child in a baby seat and themselves in front of the baby so that the three participants formed a triangle, then to play for 10 minutes. Unlike in the LTP setting, no specific tasks were requested. The data from the home and LTP sessions showed considerable similarities.

### **Coding Instrument**

In 2002, the Child and Parents Interaction Coding System (CPICS) was published in order to enable the analysis of videotaped triadic interactions. The CPICS is designed to facilitate the study of the flow of interaction, sequence-by-sequence, among all three members of the triad. In the CPICS, the participation of the child and the parents in the interaction is described, as is parenting and co-parenting. Observers view the videotapes and then register the interactions on forms. To allow for analysis of each sequence, separate forms are used for the child, the mother and the father. Each interaction is recorded on a sheet labeled with the identity of the participant who provides the contribution that starts the interaction. For detailed information about the coding used in the CPICS, please refer to the manual (Hedenbro and Lidén 2002). A brief description of the quantitative and qualitative variables used is given:

#### *Quantitative Variables*

##### *Contributions*

A contribution is a verbal or non-verbal behaviour of a member of the triad that becomes the starting point of a new sequence of interaction (a new turn-taking sequence). A contribution can be either intentional or unintentional. The communicative contributions are assessed in categories according to given criteria. Eight categories of contributions were used. Three of these eight categories are related to the focus of the child or parent, including *attention to object*, *attention to parent*, and *attention to child*. Three others assess the tone of voice of the parents or child including *neutral vocalization*, *negative vocalization*, and *positive vocalization*. One category, *initiating an object*, refers to the introduction of a new toy or other object by the parents. The eighth category used was *hiccoughs*, sighs etc.

##### *Affirmation*

Affirmation occurs when the parents respond positively to the child; it can be either verbal or non-verbal.

### *Clarification*

Clarification is the repetition of a verbal or non-verbal initiative or contribution. The clarifier may repeat the original initiative or contribution exactly or in a slightly varied form.

### *Turns*

Turns are contributions, affirmations, responses, or clarifications.

### *Turn-taking sequence*

A turn-taking sequence is a sequence of individual turns between both the parents and child that follows the child's or a parent's contribution. A turn-taking sequence can be a single contribution followed by an affirmation and a response, or it can be a series of events in which the dialogue shifted back and forth with many turns between the members of the triad.

### *Triangulation*

Triangulation occurs when the child, interacting with one parent, turns to the other parent for signaling, emotional sharing, or social referencing.

### *Family's Shared focus*

Shared focus takes place when all three partners are involved and share the same focus. The duration of the shared focus is timed; shared focus is only assessed at 18 and 48 months of age because at these ages toys are introduced. The concept of shared focus bears similarities to the concept of joint attention, which is used when studying dyadic interaction.

### *Eye contact*

Two types of eye contact are recorded: eye contact between the mother and the child and eye contact between the father and the child. It is only assessed when the child is 18 and 48 months of age, because by these ages, eye contact has become clear and easier to assess.

### *Qualitative Variables*

#### *Inclusion versus exclusion*

Inclusion occurs when each parent gives space to the other parent's interaction or activity with the child. Exclusion occurs when one parent physically excludes the other parent from interaction or activity with the child.

#### *Synchronization*

Synchronization is a qualitatively assessed process of emotional engagement and interactive flow between and among the three partners, in which they are all included in the interaction.

#### *Statistical Method*

Descriptions of observed data are provided, along with mean and standard deviation for the comparison group and individual values for the case family (child, mother, and father, respectively). In the results section, we comment only on values in the case that deviate more than 1 SD from the values in the comparison group. All values that differ between the case family and the comparison families are illustrated by both tables and line graphs. The SAS 8.2 was used.

## **Results**

### *Interaction Observations*

#### *Child*

Sofie showed values higher than those of the other children who participated in the Swedish portion of the international longitudinal study (Table 1) with regard to *turn-taking* and *turns* at 3 months; the total of contributions and two specific categories of contributions at 9 months (*attention to object* and *positive vocalization*); and one category of contributions at 18 months (*coughs and hiccoughs*).

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Table 1. Children's frequency of behaviour at 3, 9, 18, and 48 months. Figures show total number for case child and mean number for comparison children (standard deviations in parentheses).

	Case child				Comparison group			
	3	9	18	48	3	9	18	48
<i>Contributions</i>	11	40 <sup>a</sup>	24	14	14.3 (9.2)	19.8 (10.3)	15.2 (11.8)	14.0 (9.2)
<i>Attention to Object</i>	3	32 <sup>a</sup>	23	13	7.2 (7.4)	12.3 (8.8)	13.8 (10.8)	13.0 (8.9)
<i>Positive Vocalization</i>	2	9 <sup>a</sup>	3	3	0.5 (0.9)	1.9 (2.3)	3.1 (3.1)	5.6 (6.2)
<i>Hiccoughs</i>	0	10 <sup>a</sup>	3 <sup>a</sup>	0	1.9 (2.5)	1.2 (1.9)	0.0 (0.0)	0.2 (0.6)
<i>Turn-taking sequences</i>	9 <sup>a</sup>	4	2	6	3.7 (2.7)	3.9 (2.3)	6.2 (3.4)	6.7 (4.0)
<i>Turns</i>	52 <sup>a</sup>	11	8	20	11.9 (8.4)	14.1 (12.2)	22.1 (16.5)	21.6 (14.2)

*Mother*

Sofie's mother showed values higher than the other mothers (Table 2) with regard to two categories of contributions at 3 months (*positive vocalization* and *negative vocalization*); *turn-taking*, *turns*, and four categories of contributions at 9 months (*attention to object*, *attention to parent*, *neutral vocalization*, and *negative vocalization*); one category of contributions at 18 months (*negative vocalization*); and one category of contribution at 48 months (*neutral vocalization*).

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Table 2. Mothers' frequency of behaviour at 3, 9, 18, and 48 months. Figures show total number for case mother and mean number for comparison mothers (standard deviations in parentheses).

	<b>Case mother</b>				<b>Comparison mothers</b>			
	<b>3</b>	<b>9</b>	<b>18</b>	<b>48</b>	<b>3</b>	<b>9</b>	<b>18</b>	<b>48</b>
<b>Contributions</b>	8	22 <sup>a</sup>	10	9	4.6 (3.4)	4.1 (1.9)	5.6 (4.0)	7.0 (4.8)
<i>Initiates Object</i>	0	9 <sup>a</sup>	9	7	0.5 (0.9)	0.5 (0.9)	4.6 (3.7)	6.5 (4.5)
<i>Attention to Child</i>	3	12 <sup>a</sup>	3	7	2.8 (1.9)	1.9 (1.2)	4.4 (3.6)	4.5 (2.9)
<i>Positive Vocalization</i>	2 <sup>a</sup>	0	1	0	0.0	0.0	0.0	0.2 (0.6)
<i>Negative Vocalization</i>	2 <sup>a</sup>	6 <sup>a</sup>	2 <sup>a</sup>	0	0.8 (0.9)	1.2 (0.8)	0.4 (0.8)	1.7 (4.4)
<i>Neutral Vocalization</i>	7	19 <sup>a</sup>	4	7 <sup>a</sup>	4.1 (3.0)	3.8 (1.7)	4.7 (3.3)	3.1 (2.2)
<b>Turn-taking sequences</b>	5 <sup>a</sup>	4 <sup>a</sup>	3	2	1.3 (1.9)	1.6 (1.1)	3.0 (2.6)	2.5 (2.8)
<b>Turns</b>	15	14 <sup>a</sup>	5	3	7.0 (17.7)	5.2 (3.9)	7.8 (8.0)	7.8 (10.8)

*Father*

Sofie’s father showed values higher than the other fathers (Table 3) with regard to *affirmation* and one category of contributions at 9 months (*attention to child*); and one category of contributions at 18 months (*negative vocalization*).

Table 3. Fathers’ frequency of behaviour at 3, 9, 18, and 48 months. Figures show total number for case father and mean number for comparison fathers (standard deviations in parentheses).

	Case father				Comparison fathers			
	3	9	18	48	3	9	18	48
<b>Contributions</b>								
<i>Attention to Child</i>	3	12 <sup>a</sup>	3	7	2.8 (1.9)	1.9 (1.2)	4.4 (3.6)	4.5 (2.9)
<i>Negative Vocalization</i>	1	0	2 <sup>a</sup>	0	1.1 (1.0)	1.7 (1.8)	0.5 (0.8)	1.2 (3.2)
<i>Affirmation</i>	5	9 <sup>a</sup>	8	7	4.8 (2.9)	3.6 (2.3)	8.2 (5.9)	5.6 (3.4)

*Family’s shared focus*

At 18 months, Lena and Thomas shared Sofie’s focus 30% of the time, in contrast to parents in the comparison group, who shared their children’s focus a mean of 71% of the time. At 48 months, Lena’s and Thomas’ proportion had increased to 79%, whereas the mean in the comparison group remained 71%.

*Eye Contact between Parents and Child*

At 18 months there was no eye contact between mother and child or father and child in Sofie’s family while in the comparison group, eye contact between mothers and children took place at an average of 4.7% of the total observation time, and eye

contact between fathers and children at an average of 4.9% of the time. At 48 months, the percentage of eye contact had increased to 2% between mother and child and 3% between father and child in the case family. In contrast, there was no eye contact between any of the mothers and children in the comparison group and almost none (0.03%) between the fathers and children in the comparison group.

### *Numbers of Differences*

A calculation of the number of differences of more than +1 SD or -1 SD was conducted for all observation periods. The data presented in Table 1 show that Sofie's mother exhibited the highest number of observations of more than +1 SD, which indicates a high activity level in the triadic situation. Most of these differences were noted at the 9-month LTP session. Sofie and her father did not show such a high number of total differences in comparison to the other children and their fathers at this time or any other.

### *Qualitative Observations from the LTP Sessions*

#### *3 Months*

The child acted with strong character. She vocalized, and was able to handle the transitions. She actively coped with being with two parents and made two so-called triangulations. Her facial expressions were quite positive, but were of short duration and ended abruptly. She wanted oral stimulation and tried sucking on her fingers but was not allowed to do so by her parents.

Lena, Sofie's mother, did not only take many initiatives, but her initiatives were also unusually rapid. She moved her whole body toward Sofie very quickly, moving in close and then rapidly leaning back. Thomas also took initiatives, but they were neither as fast or as numerous as Lena's. He moved his body appropriately and kept an appropriate distance.

The parents cooperated and included each other during triadic play. One coder assessed their interaction as partly synchronized, and the other assessed it as mostly synchronized. Lena and Thomas seemed to enjoy talking to each other during Task 4. Sofie looked at them and seemed to feel that she was part of the threesome, despite not being included in the interaction (as per instructions for Task 4).

### *9 Months*

Sofie still acted decisively in the LTP scenario, but seemed to put her energy in understanding her parents' signals, especially her mother's, instead of being busy with her own exploration like most of the children in the comparison group. On the other hand, Sofie did not get approval from her parents for her competence in waiting and following their focus, which would have been more supportive and which was more common in the comparison group. She demonstrated less eye contact, but still regulated herself nicely, e.g., when she was not allowed to play with the belt attached to the child seat she got frustrated but calmed down. At 9 months, Sofie's vocalization was stronger and had a tone of negative affect. Her facial expressions were strained and not as positive as one would expect at this age. Lena was still very active and now used a toy in the play scenario, almost "attacking" Sofie very rapidly and then withdrawing. Now and then, Lena's attempts to engage Sofie in play were rejected and a few times Lena said, "Aren't you interested in me?" "Is the belt more fun?" and "Maybe it's more fun to play with dad?" It seemed like Lena felt she could not establish contact with the Sofie. Lena sought eye contact with her daughter only a few times.

During the 9 month LTP session, Thomas played at a higher tempo than at the sessions when Sofie was 3 months old. He used the toys in the same way as Lena did, and played with Sofie in a manner similar to Lena's. Thomas' facial expressions lasted longer than Lena's.

Both coders assessed the triadic interaction as only partly synchronized, because the parents seemed to cooperate less and instead engaged in parallel play. Thomas seemed to withdraw, especially during Task 4, when the parents were supposed to interact with each other. He was not very engaged and yawned several times. Sofie did not seem to feel part of the threesome.

### *18 Months*

Sofie had not developed as would be expected. She gave the impression of being developmentally younger than her age. She had grown quieter and her babble had not developed into any words at all. She did not undertake many play initiatives and did not complete play or interaction activities. She used her body to exclude herself when playing, especially when playing with her mother. Sofie rarely established eye contact

and exhibited hardly any triangulations. Her facial expressions were neutral and difficult to interpret.

Lena was less active in playing than before and had a tense facial expression. She commented that her daughter did not want to play with her. Lena did most of the playing; Sofie did not participate. Joint focus was absent. Lena did not seek eye contact with her daughter and provided neither verbal nor nonverbal affirmation of the way Sofie played.

Thomas was very active in attempting to engage Sofie in play. He took a lot of initiatives but did not accompany Sofie's focus, although he sometimes provided verbal or non-verbal affirmation of Sofie's play. Although Sofie did not exclude herself from her father, there was no sign of joint attention and shared emotions.

The triadic interaction was not synchronized and both parents seemed to treat Sofie as much younger than her age. Having toys seemed to make the parents more comfortable during the 18-month scenario. Thomas and Lena looked more relaxed in the way they sat and did not move bodily so close to Sofie when they used the toys to play with her.

During Task 4, the parents talked nicely with each other and still noticed Sofie's play. They commented that their daughter seemed to enjoy herself more when she was alone and when she was allowed to continue to play by herself rather than being interrupted. Sofie looked toward her parents a few times.

#### *48 Months*

At 48 months old, Sofie appeared to act much younger than her age and could only speak a few words. She was interested in playing with toys that were offered to her and played the whole time, sometimes symbolic games. She was able to follow her parents' interactions, but only took the initiative to interact a few times. Her facial expression could be described as blank. She smiled only once. Her mother acknowledged the smile and asked her to invite her father to join her in play. Sofie simultaneously smiled, looked at her father, and asked him to join her in play.

Lena played with Sofie in a more relaxed way; this was especially noticeable in Lena's body posture and facial expressions. Lena appeared to enjoy playing and invited Sofie to join, but did not allow enough time for Sofie to respond, almost as if she did not expect any response.

Thomas also played in a relaxed way and seemed to enjoy playing. He shared Sofie’s focus a few times, but mostly introduced his own ideas. A few turn-taking sequences took place.

During the triadic interaction, Thomas followed Lena’s initiatives, but also took a few initiatives of his own. However, Lena, Thomas, and Sofie were not able to achieve and maintain shared focus during Task 3 in the LTP session, although observers assessed the flow of interaction and engagement as synchronized triadic interaction.

*Summary of Observations Regarding Synchronization*

Table 4. Synchronization in the case family

	<b>Dyad Mo-Ch</b>	<b>Dyad Fa-Ch</b>	<b>Triad</b>
3 months	Mostly	Mostly	Partly/Mostly
9 months	No	Partly	Partly
18 months	No	No	No
4 years	No	Partly	Yes

Dyadic synchronization started positively at three months in the case study family, but it appears to have been more difficult to synchronize the interaction in the triad. At nine months, synchronization was difficult in the mother–child dyad and was not really achieved in the other subsystems. At 18 months, neither in the subsystems nor the system as a whole was synchronization achieved. At 48 months, there was better synchronization in the triad than in any of the dyadic subsystems.

*Interaction in the Home*

At the observation session at the families’ homes when the children were three months old, three of the 20 families adopted a different style from that employed during the corresponding LTP session. In one of these families, the child’s development was normal, whereas the children in the other two families displayed signs of atypical development. One of these two children was Sofie whose parents

first sat down on a sofa with the child's face turned away from them. Sofie sat on Thomas' knee, and when Lena started to interact with her, Sofie ignored her. Then Lena and Thomas put the Sofie in a baby seat, following the researchers' instructions, but they put a "baby gym" in front of her, so it was difficult for them to start any interaction with her. Sofie also used a pacifier. Lena sat in a position that did not afford her any eye contact with Sofie, in contrast to Thomas, who placed himself in a position where eye contact would have been possible. No real interaction started and Sofie focused her attention on the baby gym.

## **Discussion**

The results can be summarized in the following way: At 3 months, Sofie took an active part in interaction, especially regarding turns. Turn-taking sequences tended to be more frequent than among the children in the comparison group. Lena contributed more vocalization than the other mothers, especially positive vocalization. The turn-taking sequences initiated by Lena were more frequent, as were the turns themselves. Thomas' pattern of interaction was very similar to that of the fathers in the comparison group; no deviation was found. The father and mother cooperated and, as in many families, the father followed initiatives taken by the mother in triadic play. The family was not developing an exchange characterized by a synchronized flow in the triad, probably because of the pattern of many contributions. The qualitative observations indicate that Sofie actually did demonstrate social capacity by seeking to establish contact with her mother, and in a way, Lena responded to this. However, as Lena herself was quite highly active, the turn-taking sequences occurred more often after her contributions than Sofie's, which perhaps was not supportive of Sofie's efforts to establish communication. Perhaps since Sofie already had difficulty establishing communication, it would have been more helpful if Lena had affirmed and supported her contributions.

At the nine month LTP session, the pattern of communication in the triad was quite complex. Sofie's overall contributions were frequent, but there were fewer turn-taking sequences. Although *attention to parents* did not differ between Sofie and the other children during triadic play, Sofie's contributions more often included *attention to objects*, which could mean that already at this age, she focused more on objects than people. Lena differed from other mothers in a number of variables. She exhibited

more total contributions, especially *neutral vocalization* and *negative vocalization*. She also made more affirmations and took more turns than the other mothers. The turn-taking sequences initiated by Lena's contributions (but not by Sofie's) occurred differently from in other families. The quality of the observed interaction suggests that Lena was stressed. This was visible both in the way she initiated contact with Sofie (usually with her body leaning towards the girl) and the way she used toys.

Thomas was more active than the other fathers, especially in affirming Sofie's contributions. Providing this extra affirmation might have been a way of trying to provide Sofie with support and to establish contact with her. The flow of interaction in the triad was bad with hardly any synchronization. The parents seemed to cooperate less than when observed at 3 months, and instead engaged in instances of parallel play. Later, when Sofie was diagnosed with an autistic spectrum disorder, Lena said in retrospect that she had felt rejected by the child, which gave her the same feeling as when she felt rejected by her own mother as a child. She added that this might have influenced her behaviour toward her daughter.

At 18 months, compared with the other children, Sofie differed in shared focus, eye contact with the mother and with father, which she exhibited less frequently than the other children. Lena and Thomas did not differ from the other parents, except via a tendency to use negative vocalization more often. Observation of the triadic interactions indicates that the Sofie excluded herself from triadic play, that her speech had not developed, and that her earlier quite active vocalization had become less frequent. The qualitative interpretation of the observations was that Sofie was trying to show that she recognized and followed her parents' interaction, although she had given up her efforts to start an exchange. There was no joint focus in the triadic play and the triadic interaction was not synchronized.

At 48 months, Sofie still had poor language skills, although she had started to use words and short sentences. Her capacity for eye contact with both her mother and father was similar to that of the other children. Lena used neutral vocalization more often than the other mothers. In the triad, shared focus had increased, but although they did not have a high quality of shared focus during play and although Thomas excluded Lena a few times during triadic play, the flow of interaction and engagement showed the characteristics of synchronized triadic interaction.

Our observations support the suggestions that those who work with autistic children and their parents should focus on the following aspects of early

communication: “joint attention”, “shared focus” and “synchronization”. This is in line with earlier proposals (Bruinsma *et al.* 2004 and Osterling *et al.* 2002) to focus on the families’ capacity to engage in the same activity and interests. Our observations also support Siller and Sigman’s (2002) suggestion that the quality of synchronization in dyadic interactions, as well as in triadic interactions, should be further investigated as part of the future development of programs for interventions and that early observations in the child’s home seem to be of importance.

### **Clinical implications**

Parental reports indicate that symptoms of autism are suspected in approximately 50% of cases before the child is 1 year old (Ornitz, Guthrie and Farley 1977). Despite this, parents seem to seek help most often when their child is around 18 months old (Siegel *et al.* 1988). Several groups of researchers (Dawson, Meltzoff, Osterling and Rinaldi 1998; Mandy, Sigman, Ungerer, and Sherman 1986; Smith and Bryson 1994) report that the early development of autism needs to be better described and understood in order to develop better criteria for diagnosing autism in infants.

In the current case, the most obvious differences between Sofie and the children in the comparison group appeared when Sofie was 9 months old. Among typically-developing children, Tomasello (1995) terms this age the “9 month social-cognitive revolution,” because an important developmental step is taking place. As language and mentalization capacity develops at this age (Fonagy *et al.* 2002) and intersubjectivity (Stern 1985) has developed, average children are supposed to start to understand and comprehend what others feel, to exhibit clear intentions in interactive situations and have usually found a rhythm in their interactions with their primary caregivers (Trevarthen 1979). From such theoretical considerations, it seems appropriate to focus on observations in the homes in cases where rhythm in the interaction between the child and caregiver has not been established by the time the child is around 9 months old.

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## **APPENDIX**

### *Postnatal Background*

When the family returned for the 4 week interview both parents were happy as parents although disappointed with the delivery. The birth had lasted for 36 hours and ended with a caesarean delivery under full anesthesia. The father was not present to take care of the baby after birth as he had wished, because he was required to stay in the delivery ward. The parents were very unhappy about this and about not being immediately reunited.

The decision to perform a caesarean section (at week 41) was made because the mother was tired and the child's heartbeat was slowing down. Sofie was born healthy with an Apgar score of 6/10 at 1 minute and 8/10 at both 5 and 10 minutes.

At the maternity ward, the mother tried to breastfeed, but as this was unsuccessful she started to bottle feed. The mother felt this was OK and the father agreed.. After coming home, the baby slept well at night and ate regularly. Thomas and Lena reported no difficulties. They were happy being a family.

At the LTP session at nine months, Lena still expressed sorrow due to her experiences during delivery. She had consulted the psychologist at the baby clinic and was to take part in a support group for women who had given birth via caesarian section, but no other clinical intervention or psychiatric assessment was indicated.