EARLY COMMUNICATIVE INTERVENTION IN PSYCHIATRIC MOTHER-CHILD INTERACTION: a pilot study

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Abstract

This pilot study reports on a project on early communicative intervention, applying the principles developed by the Hanen Center in Toronto, Canada. The two children involved were under two years of age, and mother-child relationships were disturbed due to psychiatric backgrounds of the mothers. The two mother-child pairs attended a baby day-care center specialized in treating feeding, sleeping, temperament, and/or behavioural problems in young babies. The communicative intervention took place in a period of six months. Free play sessions were video-recorded six times, each followed after a week by an intervention session, in which fragments of the previous recording were used to demonstrate the mothers the positive effect on the child's behaviour. Speech production of the children developed to age adequate levels. The mothers were asked for their subjective evaluation of the intervention. Furthermore, an evaluation of the recordings was made by the second author with regard to three prerequisites for communication: intersubjective tuning, transmission of messages to the partner, and turntaking. Early communicative intervention appeared to have a beneficial effect, which spreads to other aspects of a problematic mother-child relationship too.

As a part of her study, the second author participated in the day-care center and she offered the communicative intervention under supervision of the Hanen-trained first author. It resulted in an M.A. thesis (Kiestra, 1997).

1. Introduction

Speech is a very common interpersonal phenomenon, which develops from birth onwards in the complex baby-caregiver relationship. Several aspects are intertwined with each other in that developmental process: emotional-affective development, as well as sensory-motor, social, cultural, cognitive, and linguistic development. Problems in either of these fields may negatively influence the outcome of the development of speech communication. Early intervention tries to prevent later, more severe, disorders in children and parents at risk.

Many risk factors are formulated in literature, either as characteristics of the baby, of the parents, or as a combination of factors that aggravate effects on both parent and child. The factors can be of a purely medical nature such as a prematurely birth of the baby, or of a social nature such as acute family crisis or mother-infant separation (e.g.

Rosetti, 1996). Fairly simple risk factors may have multiple effects due to change over time and the complex reciprocal relationships between the child's environment and its constitution. Yet, the status of cause and effect in developmental problems is not at all clear. In order to obtain a more accurate view on patterns in development, a regular monitoring from various angles of the pairs involved is required. A team of early interventionists with different primary disciplines can best do this. When the needs of the children and their families are met effectively in some of the fields, certain other aspects of the developmental process may progress far more positively than expected (Billeaud, 1993).

In this pilot study we offered communicative intervention to two mother-toddler pairs with psychiatric etiology. Both pairs attended Babylon: a mother-baby day-care center for mental health, specialized in treatment of problems in bonding, feeding, sleeping, and behavioural problems of children under two and their siblings. Mothers with problematic histories, such as motherhood depression, a battered childhood, or incest experiences are offered multidisciplinary support to establish a more normal relationship with their infant. Our intervention was based on principles of the Hanen Early Language Parent Program (Manolson, 1992; Manolson, Ward & Dodington, 1995), as described below.

The Hanen intervention program is originally developed for parents of children over three years of age with communicative problems. It focuses on the dialogue with the child at his/her level of comprehension, as expressed vocally and via body language. "Allow your child to show you what he wants to tell you" is the first principle in the Hanen intervention. By observing the child in his attempts to communicate, the parent more easily adapts his/her responses to the child's level of expression and understanding. "Waiting for the child to finish his turn" is another aspect of the intervention principle that a parent best follow their child's lead. Thirdly, listening to the child's sound productions, as well as imitating and interpreting them are important to keep the conversation going. Furthermore, parents learn to adapt their own level of language use to that of their child. They then can subsequently add language that is more easily understood by the child, because it fits in with the actual situation and activities.

We investigated the feasibility and the effects of the Hanen-based communicative intervention in parents with children *younger than three*, and in cases where the *parents themselves have difficulties* in normally relating to their babies. The italic words refer to aspects that were new to Hanen-based intervention at the time of the study.

2. Method

2.1 Subjects

Basic to the Hanen-approach is offering intervention that is specially adjusted for the problems of a specific parent-child pair, although the parents do attend group sessions. However, the two mother-child pairs in this study had communicative intervention individually since they were not attending Babylon on the same days. Our Hanen intervention was offered as an extra besides the regular treatment of the Babylon staff

members. They were offered the intervention because these two children were amongst the younger ones in the day-care center at that time, and feasibility-and-effect in relation to age of the child was an important aspect in our pilot study. The histories of the two mother-child pairs, with fictive names, are given in short below.

Esther and Silvia

Esther is six months old when she and her mother Silvia are assessed in Babylon. Severe difficulties in feeding are the most prominent problem. Esther is a first-born after a pregnancy of 37 weeks and breast-feeding is unsuccessful already after five days. According to Silvia, bottle-feeding is problematic as well: Esther does not drink the indicated quantity, "because she is lazy". During a ten-days-stay in hospital Esther drinks her bottle and returns home for only a fortnight. She is then hospitalized again and refuses her bottle there as well. She is fed by means of intubation to prevent dehydration and intensive pediatric care follows for five months because of gastro-eusophagal reflux and allergic reactions to food. This eating problem is not, according to the Diagnostic Classification of Mental Health 0-3 (1994), a primary diagnosis. It is part of a larger syndrom, which includes parental effects upon the relationship.

Silvia and Esther have an affectively and behaviourally disturbed relationship. Silvia is extremely anxious about Esther's food intake. Silvia, for example, gives an extra bottle at night while Esther continues to sleep. She herself has a history of feeding problems in relation with her own mother, who still has a dominant role in Silvia's family. Silvia has a low self-esteem, and a tendency towards egocentricity, rigidity, and exaggeration. Trapped between the grandmother and mother Silvia, Esther's father hardly has the chance to attribute positively to the problems. The staff of Babylon had worries about the developmental progress of Esther due to overprotection by her mother combined with reactive attachment and Silvia's difficulties in accepting the growing distance between her and her daughter. She also believes that other people will have great difficulty in handling Esther.

We suggested Silvia the communicative intervention when Esther was 11;2 months old, which she accepted without hesitation. At that time Esther is a vivid and healthy little girl who makes good contacts in the group, although she is of the quiet and observing type. Her physical and motor development is age-adequate. Intervention ends when Esther is 15;3 months old. Intervention in this pair is directed primarily at the mother, who is too dominantly present, which will hinder the infant to explore her world normally.

Raoul and Marian

Raoul and Marian are assessed at Babylon when Raoul is six months old. Marian became pregnant against her wishes when 40 years old and then broke off her relation with Raoul's father due to constant quarrels. Her pregnancy is characterized by many problems: she probably expected twins but one of the fetuses was aborted precociously. She hesitated about aborting her second child (Raoul), yet decided to have this baby, partly because she wanted to know if it was healthy. Once Raoul is born, she experiences the burden of rearing her child alone and she feels not ready for motherhood. She worries about Raoul's health a lot and fixates upon physical problems of her son. Marian as a child severely lacked affection and structure in her life. She has a dependant personality with "borderline" characteristics in her personality structure: multiple unstable relations, unstable self-esteem, and defective

control of moods and impulses. These phenomenons have come up in various situations and when Raoul is born Marian is very conscious of her affective deficit. She develops a severe depression and is very anxious. She perceives Raoul constantly as a patient, aggravating his physical problems.

Raoul was a baby who was crying a lot from birth onwards, he did not sleep much, and vomited frequently. Bayley-scales (at the age of 8 months) indicate that Raoul then is one month behind mentally but is age-adequate for motor development. He begins to walk when 16 months old and his first words occur when 17 months old. We offered communicative intervention when Raoul was 18 months old, which was accepted by Marian immediately. Raoul is then doing physically well and has only slight problems with sleeping rituals: he then is easily frustrated and shows his irritable temperament. Intervention ends when Raoul is 22;2 months old.

2.2 Intervention

Video recording is an important means in the intervention. It is used to show the parents afterwards the moments where communication is successful either verbally or non-verbally. Video feedback is also used to show progress in communicative abilities.

The intervention consisted of six observation sessions about every fortnight and in between discussion sessions to review the previous recording and to give advises. These advises are adjusted to each pair. In this pilot study we have chosen to observe by means of videotaped *free play* situations. The first recording of each pair is used to decide about the first goal of the communicative intervention. The week after each recording was used to analyze the tape for evaluation of the intervention (see below). This permitted us to select fragments of the interaction to be used in the intervention. One week after recording the mother is shown those fragments in which there is qualitatively good communication. That may be a moment of shared pleasure, of imitation, of understanding what the partner means. This watching-the-video-procedure is repeated after every recording, stressing upon the moments, where the parent correctly applies the communicative advises. At the same time we show them the effects on their children and give the further advises. Furthermore, both mothers were given information about the levels of speech production and perception in children of that age.

Esther and Silvia
Silvia is very dominant during the first session: she talks and labels almost constantly. She interferes in Esther's activities, shows her all the time "how to" play. Silvia and Esther only rarely have face-to-face contact: both Silvia and Esther show parallel play and few messages are transmitted between them. So turntaking is minimal as well. The mother speaks in a monologue, which is of a far too difficult level for a girl of 12 months. Her intonation and mimics however are inviting, but Esther ignores her mother.

The important Hanen principle for communicative intervention is to *Observe* the child's attempts to communicate, to *Wait* for them, and to *Listen* to them (OWL). And Silvia is typically a mother who needs this advise: she admits to be very controlling. She quickly picks up the advise to OWL although she finds it very difficult. During

the second recording Silvia is already more attentive to Esther's activities and her many babbling sounds. Silvia feels proud that Esther now walks too. She is advised to start imitating Esther's babbling sounds in the second intervention session. This results in turntaking during the third recording and then Silvia is suggested to make short sentences about Esther's actions, like "Yes, you put it in". Silvia still has difficulties with regard to the OWL principle, so this was a recurring advise in all sessions. Esther became more self-confident in her behaviour and she used simple words together with her actions. Silvia notices very well what Esther is up to and she now recognizes the moments that Esther orients towards her. She repeats Esther's utterances and words, but with a tendency of too high a tempo. With new playing material Silvia becomes very enthusiastic and forgets to OWL again. But she quickly recognizes that behaviour and again tunes in with her daughter. When Esther is almost 16 months old she communicates verbally age-adequate with her mother, as well as non-verbally because Silvia and Esther are much more looking at each other. Both initiate conversations and·take turns. Silvia finally is given a compilation of the recordings as a reminder to follow her child's lead in their conversations.

Raoul and Marian

Marian shows in the first recording of free play with Raoul that she does not understand him. When he points at things she follows his gaze direction, but without an attempt to find out what he means. Marian let Raoul do what he wants to do, just by watching him, and without any initiative to play together with the objects present. When Raoul picks up a telephone, she wants him to say "Hello, grandpa" which she repeats several times in a stereotypical way. But Raoul is studying different aspects of that telephone which she does not notice. Raoul's sound productions are completely neglected, because he is not understandable.

Marian is watching her son, but she is not observing him in order to recognize his attempts to communicate. When reviewing the nice fragments in the first recording, she is critical about her own attitude. She is willing to understand Raoul better, and therefore "listening to his sounds" is for her our first advise. In the second recording she really is very attentive to Raoul's utterances. She tries to imitate him and Raoul clearly notices the change. He concentrates much better upon his play and his mother is surprised that he can do so. She is advised to use short sentences about what Raoul is doing and to translate his actions in words. During the fourth recording session Marian had a slight relapse, but Raoul manages that well by insisting that she names the object shown to her. And Marian, at her turn asks Raoul to label objects as well. Marian is explained how to add language. Raoul and Marian communicate nicely together although Raoul had been ill the week before the fifth recording. Marian follows Raoul's lead in play and they mutually tell each other about the cars in the play. Raoul answers his mother's questions "Where is your ear, your nose?" And Marian joyfully understands that she reinforces Raoul by repeating his utterances. When Raoul is 22;2 months old he talks to his mother about his visit to the doctor and he is understandable. Marian enjoys the nice fragments of the video recordings. She adapts very well to Raoul's level of communication. She expresses that it is almost too good to be true, although it feels very natural for her to communicate with Raoul the way they do now. She also receives a compilation of the 6 recordings to remind her of the principles.

2.3 Evaluation

For Esther the Bayley Scales at seven months of age had not given a realistic picture according to the psychologist. Esther's Bayley scores therefore missed in her file. For Raoul we did not have scores on the Bayley Scales either. We evaluated the children's level of speech and language performance from the video recordings before and after the intervention. Furthermore, we asked the mothers to give their appreciation of the intervention. Communicative progress in these two mother-toddler interactions during free play was studied with regard to three prerequisites of communication, adapted from Van der Stelt (1993): intersubjective tuning, transmission of intentions: messages, and turntaking. We trained for consensus upon these categories.

Tuning is counted in six categories: **codes**

face-to-face contact,	**ftf**
mother watches the face of the child who is not looking at her	**nftf**
simultaneous vocalizations	**sv**
touching each other	**teo**
following the gaze direction of the partner	**fgd**
attention for the same object.	**aso**

Transmission of intentions is measured by means of six categories: **codes**

mother is looking at the face of the child and says something	**mftfv**
mother is looking at the face of the child and shows an action	**mftfa**
mother observes the child's body movements and comments	**mobv**
mother asks question	**mwh**
child is looking at the face of the mother and says something	**cftfv**
child is looking at the face of the mother and shows an action	**cftfa**
* This extra category is used for Raoul. At his age he is able to transmit intentions by means of an action in combination with a sound production without looking at his mother.	**cps***

Turns are categorized with regard to the main modality used: **codes**

a verbal turn of the mother or the child directed at the partner	**mvt/cvt**
a mimical turn of the mother or the child directed at the partner	**mmt/cmt**
tactile turn or an action of mother or child directed at the partner	**mtt/ctt**
turns of mother or child that are not directed at the partner.	**mut/cut**

3. Results

3.1 Speech-language performances

Analyzing the first recording, Esther does not produce words, but she seems to be age-adequate with regard to understanding speech, although she does not seem to listen to her constantly talking mother. She is very attentive to other persons when she is participating in the day-care group activities. She utters some sounds, that quickly develop during the intervention period via labeling of objects to two-word phrases when she is 15;3 months old, which is age-adequate. By then she can adequately participate in conversations with caregiving adults.

Raoul produces a few single words in the first recording when he is 18 months old, but he is not labeling objects consistently. His many babbling sounds resemble words but are not easily understandable because they seem unrelated to his activities. He uses his first two-word sentences when he is 19 months, and the number of these types of utterances increases as well as his imitations of parts of the utterances of his mother. In the last recording Raoul (22;2) uses a three-word sentence. His delay in speech production thus is becoming milder than it was at the onset of the intervention.

3.2 Intervention evaluation by the mothers

In the interview afterwards to evaluate the intervention, Silvia expresses that especially the observing aspect was very useful to her. She clearly sees that she was verbally intrusive, and this behaviour has diminished. Esther now has the chance to express herself, which brings mother and daughter closer together. Silvia says to be conscious of the changes over the past six months with regard to this bonding aspect.

Marian thinks very positively about the intervention. She and Raoul do understand each other much better, and she hardly can remember that this was different before. She appreciated the observing and listening advises better than the 'imitate' advise. Their communication now is clearly full of pleasure, which has an important effect upon their relationship.

3.3 Fundamental aspects of speech communication

Per recording five minutes uninterrupted mother-child interaction are evaluated with respect to the three communicative aspects: intersubjective tuning, transmission of messages to the partner, and turntaking.

Tuning
In Tables 1 and 2 the quantitative measures are given for the tuning categories as counted in the six recordings of the two pairs. First Esther and Silvia's results are given, followed by those of Raoul and Marian.

Table 1. Tuning categories for Esther and her mother Silvia in the six recordings: face-to-face contact (**ftf**), mother watches the face of the child who is not looking at her (**nftf**), simultaneous vocalizations (**sv**), touching each other (**teo**), following the gaze direction of the partner (**fgd**), attention for the same object (**aso**).

Tuning	Rec. 1	Rec. 2	Rec. 3	Rec. 4	Rec. 5	Rec. 6
ftf	2	8	2	8	1	8
nftf	37	36	12	27	24	22
sv	1	3	3	2	1	0
teo	1	0	3	5	0	0
fgd	3	6	2	1	1	2
aso	19	8	9	13	14	6

Table 2. Tuning categories for Raoul and his mother Marian in the six recordings: face-to-face contact (**ftf**), mother watches the face of the child who is not looking at her (**nftf**), simultaneous vocalizations (**sv**), touching each other (**teo**), following the gaze direction of the partner (**fgd**), attention for the same object (**aso**).

Tuning	Rec. 1	Rec. 2	Rec. 3	Rec. 4	Rec. 5	Rec. 6
ftf	7	0	3	5	5	0
nftf	29	32	26	18	30	11
sv	0	0	0	0	0	0
teo	0	1	0	0	3	1
fgd	5	4	1	0	3	1
aso	8	10	7	15	10	5

Looking at each other's face (ftf) varies per recording due to different play situations. In recording 3 for example, Esther and Silvia are playing side by side with a doll's house. In general, visual framing (nftf) of the mother becomes more adequate (decreases slightly) probably because she "knows" what Esther is looking at. Silvia does not need to check Esther's gaze direction as much as before, which is seen in the numbers of the category "following gaze direction (fgd)" too.

Simultaneous sound production (sv) and touching each other (teo), frequent during the first six months of a baby's life, only occurs a few times in the present recordings, which is to be expected in view of Esther's age. The number of objects that are handled during the play has decreased, partly because Esther has the chance to take the lead, which Silvia picked up easily. The lower frequencies of "attention for the same object" (aso) also implies that an object is handled for a prolonged period (e.g. rec. 2 and 6).

Tuning between Raoul and his mother Marian has changed during the intervention, although the frequencies over the different recordings do not show the qualitative differences. In the first recordings the mother merely was *watching* Raoul and in the later recordings she is really *looking at him with attention*. Variation is caused by the kind of play of Marian and Raoul too. In recording 4 they are sitting at a table with a lot of cars on it. Raoul is handling them while Marian is looking at his hands. This explains the relatively low number of framing moments (nftf: 18) and the high number of "attention for the same object (aso: 15). When Raoul is walking around in the room, picking up objects and giving them to his mother, she needs to look at him much more than in the play-on-the-table situation (rec. 5, nftf: 30). In this recording Marian and Raoul touch each other three times when giving the object and "following the gaze direction" is more frequent (three times) too in order to see where Raoul is heading for. Over all recordings, simultaneous vocalizations (sv) are absent, at first because Marian does not respond upon Raoul's utterances, and later she does because turntaking is well established.

Transmission of intentions
In Tables 3 and 4 the quantitative measures are given for the six categories coding transmission of intentions as counted in the six recordings of the two pairs. First Esther and Silvia's results are given, followed by those of Raoul and Marian.

Table 3. Categories for Esther and her mother Silvia coding transmission of intentions in the six recordings: mother is looking at the face of the child and says something (**mftfv**), mother is looking at the face of the child and shows an action (**mftfa**), mother observes the child's body movements and comments (**mobv**), mother asks question (**mwh**), child is looking at the face of the mother and says something (**cftfv**), child is looking at the face of the mother and shows an action (**cftfa**).

Intent.	Rec. 1	Rec. 2	Rec. 3	Rec. 4	Rec. 5	Rec. 6
mftfv	2	5	2	5	1	4
mftfa	0	0	0	0	0	0
mobv	0	0	0	0	0	0
mwh	8	10	10	7	11	8
cftfv	0	3	0	3	0	5
cftfa	0	1	0	6	1	4

Looking at the partner is a prerequisite for transmission of intentions in the early phases of speech development. Later in its development a child "knows" that the partner present will pay attention to actions plus sound production (cps), and the child is no longer checking visually the reception of the message. This category is used in the transcriptions of Raoul and Marian, but not (yet) in those of Esther and Silvia.

Esther can transmit messages to her mother when Silvia permits her to take the lead. In recording 6 intentional communication by means of vocalizations (cftfv: 5) and actions (cftfa: 4) is present and is clearly directed at her mother, since Esther then looks at the face of Silvia. At her turn, Silvia always transmits verbal messages (mftfv), and not the non-verbal ones (mftfa), and she is not commenting upon Esther's body movements (mobs) either. The amount of questions (mwh) remains stable over the recordings. In recordings 2, 4, and 6 there are eight moments of face-to-face contact (Table 1). In recordings 2 and 4 Silvia uses five of such moments to transmit verbal messages (mftfv) and Esther three (cftfv). In the 6th recording (Table 1: ftf: 8) Esther transmits five such messages and her mother four, which means that during one face-to-face moment they keep eye contact while taking turns.
Esther will profit more and more from the intervention, because her mother is now observing her more, is waiting for her messages, and is listening to her sound productions. Her messages have effect upon her mother, who imitates Esther's sounds and who reacts more consistently upon Esther's intentions, as will be shown in the turntaking data.

Raoul and Marian clearly have profited from the intervention with regard to the quantity of transmitted intentions. Marian starts to ask questions (mwh) in recording 3 and Raoul responds (cps: in recording 4). Looking at his mother's face in combination with vocalizations (cftfv) is hardly present, probably because the cps category: actions plus sound production, is preferred. Most of the time Marian is actively present in the conversations with Raoul. She uses the moments of face-to-face contact to say something to Raoul (mftfv). In the first recording seven ftf-moments are present (Table 2) and she says something twice, like Raoul (Table 4, mftfv, cftfv). In recording 3 she uses 1 out of 3 face-to-face moments (Table 2) for transmission of intentions, and Raoul does so twice, so all moments are used to say something to the other person.

Table 4. Categories for Raoul and his mother Marian coding transmission of intentions in the six recordings: mother is looking at the face of the child and says something (**mftfv**), mother is looking at the face of the child and shows an action (**mftfa**), mother observes the child's body movements and comments (**mobv**), mother asks question (**mwh**), child is looking at the face of the mother and says something (**cftfv**), child is looking at the face of the mother and shows an action (**cftfa**). For Raoul an extra category is used, since at his age he is able to transmit intentions by means of an action in combination with a sound production without looking at his mother (**cps**).

Intent.	Rec. 1	Rec. 2	Rec. 3	Rec. 4	Rec. 5	Rec. 6
mftfv	2	0	1	5	5	0
mftfa	0	0	3	0	0	0
mobv	0	0	0	0	1	0
mwh	8	7	21	11	17	11
cftfv	2	0	2	1	1	0
cftfa	·0	0	0	1	4	0
cps	3	4	4	11	9	14

In the recordings 4 and 5 *all* those moments (five per recording, Table 2) are used for verbal communication in which Raoul participates since he sends one verbal message during those moments too. So, during face-to-face contact in the recordings 4 and 5 Marian said something to Raoul and he took his turn while looking at his mother. Face-to-face contact, a form of intersubjective tuning, is now used for communicating mutual understanding and has lost its 'blank face' quality.

Turntaking

In Tables 5 and 6 frequencies are given for turntaking in the two pairs. Upon a message from the partner various turns are possible: a simple nodding movement or a smile, touching or an action in the non-verbal modality, as well as verbal turns. We have used four types of turns for the mother as well as for the child: the audible (mvt, cvt), visual (mmt, cmt), tactile turns (mtt, ctt), and unlinked turns (mut, cut). The latter are turns that occur without a relation to previous behaviour of the partner, like talking for breaking the silence.

The total number of turns of Esther and Silvia at times differs much, and the mother always has more turns than the child, which is to be expected in communication between "teacher and pupil". Yet the 1st and 5th recording show that the discrepancy can be very large in view of the amount of unlinked turns of the mother (mut) and the total number of utterances of the child. In the 5th recording Silvia relapses to her "old" pattern of communication due to a new play situation with the doll's house. This fits in with her psychiatric status: she experiences this new situation as overwhelming and presents it to her daughter as such. This behaviour immediately has its effect upon Esther's turns. The total number of turns (total m) of Silvia has decreased over the intervention period, in favor of the verbal ones (mvt) directed at Esther. Silvia uses touch and actions in her communication with Esther, which Esther hardly does (mtt versus ctt). The visual non-verbal turntaking by means of mimical expressions is nearly absent too (mmt, cmt).

At her turn Esther clearly can profit from possibilities given. She is more present in the interaction: in the 4th and 6th recording only half of her turns are unlinked (cut),

Table 5. Turntaking for Esther and her mother Silvia in the six recordings: verbal turn of the mother or the child directed at the partner (**mvt, cvt**), mimical turn of the mother or the child directed at the partner (**mmt, cmt**), tactical turn or an action of mother or child directed at the partner (**mtt, ctt**), turns of mother or child that are not directed at the partner (**mut, cut**). The total number of turns of mother and child are given as well.
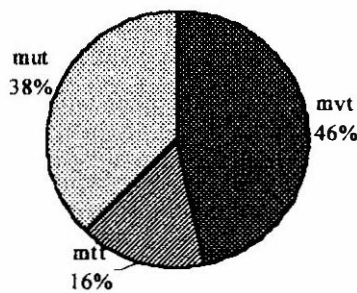
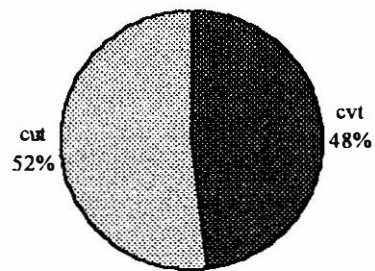| Turns	Rec. 1	Rec. 2	Rec. 3	Rec. 4	Rec. 5	Rec. 6
mvt	2	17	14	10	3	21
mmt	1	0	1	1	0	0
mtt	6	13	15	14	4	7
mut	87	27	30	39	60	17
total m	**96**	**57**	**60**	**64**	**67**	**45**
cvt	1	11	8	10	1	15
cmt	0	0	0	0	0	0
ctt	0	0	0	3	0	0
cut	5	33	30	11	3	16
total c	**6**	**44**	**38**	**24**	**4**	**31**
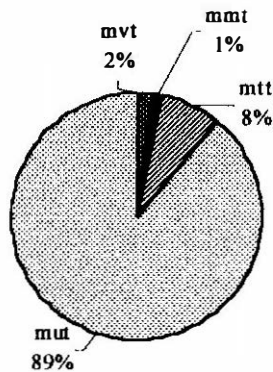
turns Silvia recording 1
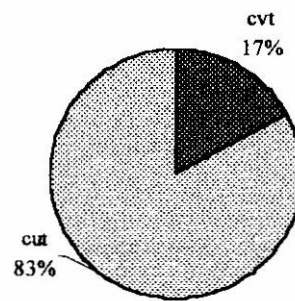
turns Esther recording 1

turns Silvia recording 6

turns Esther recording 6

Figure 1. Percentages of the different types of turns for Esther and Silvia in the first and last recordings. Verbal turn of the mother or the child directed at the partner (**mvt, cvt**), mimical turn of the mother or the child directed at the partner (**mmt, cmt**), tactile turn or an action of mother or child directed at the partner (**mtt, ctt**), turns of mother or child that are not directed at the partner (**mut, cut**).

the other half is verbally directed at her mother (cvt). Her number of verbal turns (cvt) increases with that of her mother (if we neglect that 5th recording), probably because of the drastic decrease of unlinked turns of Silvia. In Figure 1 the percentages of different types of turns of Esther and Silvia are given for the first and the last recordings, showing the progress in their communicative verbal interaction. The percentage of unlinked turns of Silvia (mut) decreases from 89% in the first recording to 38% in the sixth recording. For Esther these percentages of unlinked turns (cut) change from 83% to 52% in the sixth recording.

The total number of turns per recording of Raoul and Marian is not so different from one another as for Esther and Silvia. For Raoul most of the turns directed at his mother are verbal ones. This is true for Marian as well in the first 4 recordings. In the final two recordings she participates in his play which explains the higher score of tactile turns. For both Raoul and Marian the number of unlinked turns has decreased drastically between the first and the final recordings. Percentages of the types of turns in these recordings are given in Figure 2. An example of Marian's and Raoul's conversation is given below to show that Raoul can introduce a subject and that Marian does expand their conversation with humour, and that she imitates and interprets his messages.

Example of turntaking in Raoul and Marian in the 6th recording:

> M: "Raoul is talking a lot now, hein?"
> R: "Doctor ear."
> M: "Doctor the ear? No, you don't need that now. Doctor says it's all right."
> R: "Doctor." (points at the doctor's seat in the room).
> M: "Yes, doctor, but that is over now, hein? Ear is all right, hein?"
> R: "Doctor mama."
> M: "Mama to the doctor? Does mama go to the doctor?" (laughs).
> R: (laughs and picks up a toy).

Table 6. Turntaking for Raoul and his mother Marian in the six recordings: verbal turn of the mother or the child directed at the partner (**mvt, cvt**), mimical turn of the mother or the child directed at the partner (**mmt, cmt**), tactile turn or an action of mother or child directed at the partner (**mtt, ctt**), turns of mother or child that are not directed at the partner (**mut, cut**). The total number of turns of mother and child are given as well.

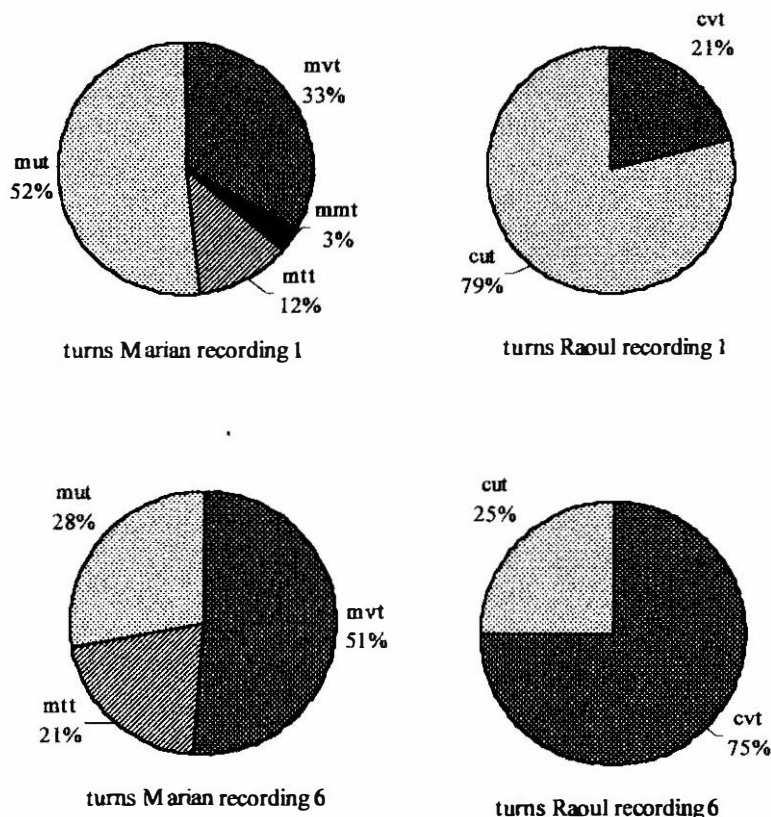| Turns.	Rec. 1	Rec. 2	Rec. 3	Rec. 4	Rec. 5	Rec. 6
mvt	19	24	2	19	14	34
mmt	2	0	0	0	0	0
mtt	7	5	4	3	17	14
mut	30	18	50	28	25	19
total m	58	47	56	50	56	67
cvt	13	13	33	7	14	36
cmt	0	0	0	0	0	0
ctt	0	1	0	0	0	0
cut	49	34	12	21	14	12
total c	62	48	45	28	28	48

Figure 2. Percentages of the different types of turns for Raoul and Marian in the first and last recordings. Verbal turn of the mother or the child directed at the partner (**mvt**, **cvt**), mimical turn of the mother or the child directed at the partner (**mmt**, **cmt**), tactile turn or an action of mother or child directed at the partner (**mtt**, **ctt**), turns of mother or child that are not directed at the partner (**mut**, **cut**).

Tuning, messages, and turns

Analysis of mother-child interaction towards the prerequisites of communication suggests that these fundamentals themselves need to change in the course of intervention. Yet, they are closely intertwined themselves. For example, when nothing happens during face-to-face contact (no messages), then no turns are possible. Subjectively, face-to-face contact, no message, and no turn feels like a kind of mutual denial of the presence of the other person: "I have nothing to say to you". The overall qualitative change in mother-child interaction, due to the communicative intervention, is thus spread over the different tables. In Tables 7 and 8 a selected synthesis of tuning, transmission of intentions and turntaking is given.

The intervention aimed at improving speech communication, in which the non-vocal aspects certainly need to be included. With regard to tuning we have chosen the face-to-face moments, wondering if the mother then would sent verbal messages (mftfv, mwh), and if the child sents vocal messages (cftfv), or actions (cftfa, cps). Turns of mother and child upon the messages of the partner give feedback on understanding.

Table 7. Tuning, transmission of intentions, and turntaking (T/T/T) for Esther and for her mother Silvia in the six recordings. Tuning is given by number of face-to-face contacts per recording (**ftf**). Transmission of intentions by the mother is given for two manners: a verbal message during face-to-face contact (**mftfv**) or asking a question (**mwh**). Turntaking by the child is given for the verbal turns (**cvt**), and for the tactile or action turns (**ctt**). Likewise, transmission of intentions of the child is given (**cftfv**, the verbal messages, and **cftfa**, the 'showing' messages) as well as the turns taken by the mother (**mvt**, verbal turns, and **mtt**, tactile turns).

T/T/T	Rec. 1	Rec. 2	Rec. 3	Rec. 4	Rec. 5	Rec. 6
ftf	2	8	2	8	1	8
mftfv	2	5	2	5	1	4
mwh	8	10	10	7	11	8
cvt	1	11	8	10	1	15
ctt	0	0	0	3	0	0
T/T/T	Rec. 1	Rec. 2	Rec. 3	Rec. 4	Rec. 5	Rec. 6
ftf	2	8	2	8	1	8
cftfv	0	3	0	3	0	5
cftfa	0	1	0	6	1	4
mvt	2	17	14	10	30	21
mtt	6	13	15	14	4	7

The number of face-to-face contacts in the recordings of Silvia and Esther varies between eight and one, but since duration of face-to-face contact is disregarded, we can not decide about the qualitative difference between 'observing' and 'looking at'. Thus, the number of messages during face-to-face contact can vary alike. In the case of this pair no (ftf) moment is unused: at least one message per person is sent. Turns taken in these situations are even more variously related to the messages sent. After the first recording, Silvia was instructed to observe, to wait, and to listen to Esther. She picked up this instruction, yet with relapses. Furthermore, Silvia asks questions (mwh). Eight moments of face-to-face contact occur in the second recording, for example, of which Silvia takes five for verbal messages (mftfv, and three times a 'waiting', silent mother). So, Esther then can use three of them to send her mother a verbal message (cftfv). When Esther is given time during face-to-face tuning, she does send verbal messages to her mother (cftfv, recordings 2, 4, and 6). Silvia's problems with 'waiting' and 'listening' are demonstrated by the number of turns she is taking in relation to the number of Esther's messages (mvt, mtt): mother is talking and showing how to.

Yet, Esther responds verbally (cvt) from the second recording onwards, probably in relation to the questions of her mother (mwh) too. Over all verbal turntaking upon one another (mvt, cvt) increases in the recordings (recording 5 being an exception). In Figure 1 (p. 11) is shown that the percentages of unlinked turns decreases between recording 1 and 6, in favor of the other-directed verbal and tactile/action turns. For Esther a tendency to combine acting and talking in her messages (cftfv, cftfa) seems to settle in the final recording. This is quite normal behaviour in young children, and it facilitates the understanding of messages of the child. The non-vocal turns of Esther are merely absent, probably because her mother already is doing a lot of acting (mtt), e.g. the recordings 2, 3, and 4.

Table 8. Tuning, transmission of intentions, and turntaking (T/T/T) for Raoul and for his mother Marian in the six recordings. Tuning is given by number of face-to-face contacts per recording (**ftf**). Transmission of intentions by the mother is given for two manners: a verbal message during face-to-face contact (**mftfv**) or asking a question (**mwh**). Turntaking by the child is given for the verbal turns (**cvt**), and for the tactile or action turns (**ctt**). Likewise, transmission of intentions of the child is given (**cftfv**, the verbal messages, **cftfa**, the 'showing' messages, and **cps**, child actions with sound production directed at the mother) as well as the turns taken by the mother (**mvt**, verbal turns, and **mtt**, tactile turns).

T/T/T	Rec. 1	Rec. 2	Rec. 3	Rec. 4	Rec. 5	Rec. 6
ftf	7	0	3	5	5	0
mftfv	2	0	1	5	5	0
mwh	8	7	21	11	17	11
cvt	13	13	33	7	14	36
ctt	. 0	1	0	0	0	0
T/T/T	Rec. 1	Rec. 2	Rec. 3	Rec. 4	Rec. 5	Rec. 6
ftf	7	0	3	5	5	0
cftfv	2	0	2	1	1	0
cftfa	0	0	0	1	4	0
cps	3	4	4	11	9	14
mvt	19	24	2	19	14	34
mtt	7	5	4	3	17	14

Raoul and Marian look at each other's faces (ftf) between seven and zero moments per recording. In the first recording seven such moments occur and only four are used for transmitting verbal messages (mftfv, cftfv). So, at least three times Marian and Raoul have looked at each other without talking: a kind of 'blank face' situation. Raoul does not communicate by means of actions either (cftfa) in the first three recordings. The number of verbal turns in both Marian and Raoul is high, but probably not mutually understood. Marian starts to ask questions in the 3rd recording, which goes together with a higher incidence of verbal turns of Raoul (cvt: 33). In recordings 4, 5, and 6 he probably starts to react more non-verbally upon his mother's questions (cps). Their communicative pattern is quite clear in the final recording: Marian asks (mwh), Raoul responds verbally (cvt) and by means of acting (cps) without looking at Marian, and Marian reacts in a similar mode (mvt, mtt). They are playing together, and Marian joins in with Raoul's activities, since he is not sending messages (cftfv, cftfa) during face-to-face contact. This is supported by data from Table 2 (p. 8) as well: the code 'attention for the same object' (aso) is quite frequent over the six recordings.

4. Discussion and conclusion

Communicative intervention along the principles of Hanen appears to be feasible in mother-child pairs even when the child is younger than two years and when the mother has a problem in relating to her child. Although the two pairs studied differed considerably with regard to their primary problems, both pairs have profited from the

intervention. Quantitatively, this is demonstrated most clearly in the change in turntaking behaviour. As to tuning and the transmission of messages, the changes are more qualitative. These aspects must be present in order to be able to take turns. Esther has grown more independent from Silvia, which is a natural process at her age. This independence was endangered by Silvia's urge to control her daughter. Marian learned that she could participate in her son's activities and that he wanted to share them with her. She felt more and more competent as a mother, which was noticed by the rest of the Babylon staff as well.

The intervention took place during a period of only six months (the duration of an M.A. trainee period), which is probably too short for the behaviour to settle in the interaction, in view of the fluctuations over the recordings. Furthermore, change in speech communicative interaction in the first two years obliges the partner to adapt constantly which is true for normal pairs as well. We think that continuation of the intervention is needed until stable speech and language use in the children (e.g. an 'ideal' communication: few unlinked turns, mostly verbal turns in book reading situations) is established. Perhaps then normal progress is secured in speech and language development of these children, beyond the context of the day-care center and the support from other disciplines. Progress in mother-child communication probably can be measured by means of turntaking aspects only, since tuning and transmission of intentions are implicitly present in turns.

The positive effect of early communicative intervention possibly could be bigger when it would start earlier in the first year of life in case of pairs at risk. Then, more severe communicative problems later in development can be prevented, and feelings of failure do not occur. The Hanen Center has developed such a preventive course for parents and children at risk: You make the difference (Manolson et al. 1995). But research and evaluation of effects of these interventions are still problematic. It is clear that counting the number of words used by the child at the onset and at the end of the intervention gives a too meager picture of the changes in mother-child communication. Analysis of turntaking in mother-infant pairs, with regard to the different types of turns, might be a better alternative.

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