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CPICS: child and parents' interaction coding system in dyads and triads

M Hedenbro and A Lidén

Child and Adolescent Psychiatric Unit, Department of Woman and Child Health, Karolinska Institutet, Stockholm, Sweden

This manual is a guide to and an instrument for describing interactions in the triad comprising the child, mother and father, using Lausanne Triadic Play (LTP). An instruction video has been developed and is necessary for training on the use of the manual (1).

The LTP paradigm was developed by Fivaz-Depeursinge and Corboz-Warnery (2). The Lausanne team made observations of family interactions over the first 2 y of the infant's life and developed a coding system called Getcef. This coding system describes and assesses the family's interaction. It also led to a developmental systems model. The coding is done on four different levels: organization, participation, focal attention and affective level. These levels are then categorized into type of alliance: disordered, conflictual, stressed and cooperative. Their findings indicated that in a cooperative alliance all family members take part in communication. This leads to a joint focal attention and the affective level can be observed.

The Child and Parents' Interaction Coding System (CPICS), developed in Sweden by Hedenbro-Lidén, analyses and codes the affective level and the different partners' participation in a dialogue between to or three people in a microanalytical way, moment by moment.

CPICS combines quantitative and qualitative parametric information from videotapes showing the level and kind of participation. The CPICS is constructed to allow repeated use as the children grow older, making comparative assessments across development possible, even though the quality and impact of the interaction are different depending on the age of the child. The social and cognitive development during the first year is revolutionary. There is a difference in the capacity of interaction and also in the meaning of interaction between infants of 3 mo and infants of 9 mo of age. The construction of CPICS enables us to see differences between ages in many aspects. With small additions and changes, the coding system is also applicable to older children. So far, it has been used up to 4 y of age.

The coding system can be adapted to observe and analyse family interaction not only in a laboratory situation but also in the home.

This application of CPICS using LTP is part of a larger international collaborative study between Lausanne (L Fivaz-Depeursinge and A Corboz-Warnery) and Basel (D Burgin and K von Klitzing) in Switzerland and Seattle (J Gottman and A Fearnley-Shapiro) in the USA, focusing on the triad of the mother, father and infant.

Theoretical background

From birth, babies already seem to have the capacity to respond to stimuli from the outside world, such as the voices, other sounds, facial expressions, hugs, touches and emotional reactions from the parents. They also contribute to the communication with the parents by taking initiatives when "contacting" the parents. Some of the contributions could be looked upon as merely reflexes, but may also be regarded as the baby's own activity in establishing an early communication, a protodialogue, with his or her mother and father. There also seems to be a natural way in which parents interpret the child's being as part of communication and give it the status of a contribution. Trevarthen (3) focused on the importance of imitation and reciprocity in the dyad of the baby and the mother as a process essential for the newborn to develop communicative behaviour and, later on, language. This process starts at birth. According to Trevarthen, the exchange of verbal and non-verbal information between the mother and the baby, the early reciprocity and turn-taking, is a primitive form of exchange of information and feelings, which forms the basis for the capacity in later life to attune communication to feelings of different kinds. This is called "primary intersubjectivity". Studies indicate that early interactions of this kind lead to mutual adjustments of communication between infants and adults (4–6). Work on face-to-face interaction has suggested that the interaction is a structured system of mutually and reciprocally regulated units of behaviour. Each partner is seen as emitting these behavioural units in coordination with his or her partner's action and his or her own intentions. Only single events do not capture the quality of interaction (7). According to Trevarthen (8), it seems that at the age of 2 mo, infants and their mothers, while they are looking at and listening to each other, are already regulating one another's interests and feelings in mutual ways. The infant must be able to adjust the interactions with the parents and other people in order to have a true mutual communication with others. Studies of the interaction between the baby and the mother indicate that the dyad can be regarded as a unit with

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rhythmic temporal synchrony. The early communication between parents and their babies seems to involve both the parents and the baby pausing for an answer or a response. Such pausing before responding and the rhythm of interaction when talking and answering may be important in the early reciprocal interactions.

The present coding system was developed for use both before and after the baby has reached the age of what Tomasello (9) calls the social–cognitive revolution, at about 9 mo. This is the age when the baby starts to engage in joint interaction with the knowledge that the other is an intentional other. Tomasello regards this achievement as a result of the baby's understanding of him or herself as an intentional agent, with intentional goals. This could also be said to be the time when "a theory of mind" has developed, a capacity that helps the child to understand that the other is like him or her but also different, in respect of intentions and emotions, for example. It is essential to study interaction before this age as the process of attachment is just beginning.

Stern (10) suggested "interactive reality" as a name for this early form of exchange during the first couple of months, later followed by "intersubjective reality". Part of this early interactive reality is also the communication within the triad of the father, mother and infant. Stern expresses that there is a gap in theory concerning the early beginning of the primary triangle. There is a field without a well-understood developmental origin (11). This need for new knowledge involves many different levels of organization and participation and can be studied on a microanalytical level. In the future this knowledge could lead to the discovery of more general clinical patterns. These studies need to focus on child and family development, but there is also an important question concerning the relationship between the parents.

In the threesome the infant is "embedded" in the parents' relationship. The space that will be given and that the infant will take, and the atmosphere that the infant is becoming part of and is also affecting, are phenomena for observation. Looking at the triadic interaction, the quality of interaction in the couple's relationship seems to be essential and can have "spillover effects" on the child. The effects of marital conflict resulting in lower quality of parenting skills have been described, and child maladjustment due to these effects has also been reported (12). Spillover effects concern the transfer of moods, emotions or behaviour from one setting to another (13, 14). This process involves the expression in one subsystem, e.g. mother and child, of feelings that are generated in another system, e.g. mother and father.

The CPICS aims to describe the child's contributions and his or her participation in the interaction, but also how the parents are parenting and co-parenting their child. Co-parenting processes include both how parents interact with each other when the child is there, and how they support each other as parents. Several studies have found links between marital quality and co-parenting behaviour. An overall understanding is that happily married couples have a greater warmth and sensitivity when interacting as a family with their child, but little has been studied on the well-functioning mechanisms in co-parenting so that they can be used clinically. Tools are needed to help parents to interact and support their child's development. McHale (15) studied how marital conflict is transferred to the co-parenting process, making that system more hostile and competitive. The parents' difficulties are transferred on an unconscious level, so we need to go to a microanalytical level to find the steps in the process to be able to help families.

The team in Basel presented results from a study with 80 couples indicating that "triadic capacity", referring to the possibility of everyone in the triad being included, during pregnancy was higher for those couples who reported higher marital quality (16).

Although the transferral mechanisms of difficulties may be unconscious, when helping parents there is a need to focus on the behaviours that are conscious for them and to find specific "steps" that some couples use that buffer the child from being involved in their problems. The communication in a triad is much more complex than in a dyad. In a triad, the rhythm and the reciprocal communication between the three possible pairs of dyads and the synchronized communication between all three is a very complex phenomenon. Synchronization is a process developed by a family to regulate and direct the way in which time is being used. It involves five submechanisms: control, prioritization, a structure of guidelines, coordination and reminding (17). This communication not only demands cooperation on both a verbal and non-verbal level, but also requires that the participants take differentiated roles.

In a triadic interaction a rhythmic temporal synchrony may also have to take place, sometimes in one of the dyads and sometimes when all three in the triad are actively communicating. When establishing communication, the child will influence and make it either easier or more difficult in the way in which he or she communicates his or her needs or focus. In a triadic communication the infant probably needs to be more attentive in order to join in with two partners. The focus in this study is to observe the process of synchronization and how it supports the infant in forming a dialogue with one or both parents.

The importance of studying the triad and the interaction from a system-theoretical perspective cannot be overemphasized, as great changes are occurring in the roles of mothers and fathers in Western countries. The father's role is receiving more attention and his participation in the interaction with the baby has been encouraged by society. Researchers who study the father–child dyad (18–20) and compare it with the mother–child relationship also find the need to look at the interactions of the whole system (21). Fivaz-Depeursinge (2) suggested that the shared relationship

established within the triad has its own features and specific development. The triadic aspects cannot be elucidated by gathering information from the separate dyads and then adding the information to understand the shared relationship within the triad; the triad itself must be observed to develop new knowledge about child and family interactions.

Clinical reflections

In clinical work with families that are having problems the following question often arises: "How did the problem start?" This question underlines the importance of observing the early interactions in a family with a newborn child. The transition from partners to parents is a big and difficult change, even though it is usually accompanied by happy feelings. Another reason for this kind of interaction assessment is the need for more knowledge in work with older children with behavioural difficulties. Often, it is not enough to treat the individual child, regardless of age; the whole family needs to be involved, as the solutions are usually to be found within the family. The systemic perspective, where the quality of the whole family is considered to be different to the quality of each family member, is therefore useful. The family system consists of four different subsystems: the three dyads of man and wife, mother and child, father and child, and the triad of father, mother and child. These subsystems are mutually related and influence each other. Each family system is sensitive to development in the other systems. The combined interaction forms the family process on a higher level (22).

Interaction guidance

Interaction guidance aims at guiding and supporting individuals in need of encouragement and help in developing their interaction skills. To make it possible to give the right help moments of natural interaction need to be studied. The next step is to identify any natural supportive interactions that occur with the child who needs help and to emphasize these, so that the parents can communicate more in a way that is helpful to the child.

Clinical work with interaction guidance, particularly the use of a method called Marte meo, is something that has inspired us to look at the importance of the micro-contributions that each family member has to make so that the interaction can flow in a harmonious rhythm, which supports the child's development. In CPICS some of the principles looked at in the Marte meo method will be observed and described. This is done with the help of analysing early interactions in non-clinical families. One of the main features of the Marte meo method (23, 24), which was founded in the Netherlands by Maria Aarts (25), is the importance of supporting active dialogue and thus turn-taking. The main way to support the flow of the turn-taking, even with older children, is by the parent's affirmation or approval of the child's contribution.

These interaction principles have not yet been studied in ordinary families in a systematic way. Using the words of Maria Aarts, children's problematic behaviour may be seen as a message: "I have not yet developed", "I need support in developing". Using this manual as a guide, one can observe the mutual communication, the turn-taking, and how this is handled in a triadic situation. It was important to find a way to identify the contributions, initiatives and responses from infant and parents. Even though infants and parents are parts of a turn-taking sequence, and later on of a dialogue, they also represent two different competences. The parents and other caregivers have to try to match the child. With difficult and undeveloped communication patterns it is easy to "mismatch". One example of this is children who, when left alone without any attention, react to this intensively by putting their energy into negative actions. When they do receive the attention they need, they are not able to respond to this and to utilize that moment. They need help and support, like a little child, to respond. These kinds of pattern are often established early. The basic elements of Marte meo apply the working knowledge of infants to the work with older children with difficulties.

A close look at the interaction between parents and newborn children shows that the parents use different steps to help the child to be active in turn-taking. Such verbal, non-verbal and vocal indications are necessary processes for the protodialogue and reciprocal communication to be formed. By observing the early interaction in the triad one can start to understand how the infant, and later on the child, is finding "scripts" to interact with more than one other person. In the dyadic interaction the intersubjectivity is central, and for the infant or child the way in which he or she will be "embedded" in the mother–father relationship may serve as a basis for further relationships in more complex systems.

Research on the communication between mothers suffering from postnatal depression and their infants tells us that mothers in this situation are less focused on their infants than are healthy mothers (26). The rhythmic patterns in the interaction between an infant and a depressed mother show loss of regularity in the vocal interaction, a flattening of local prosody and a slowing down of turn-taking sequences (27). The sensitivity and the tempo of the parents may influence the communication with their newborn child. Parental cooperation can be influenced by the marital relationship, but also by each individual partner's interaction, e.g. in the aspect of tempo. The sensitive communication that takes place between the mother and infant in the dyad is also needed but is more complex in the triadic communication. The way in which the baby is engaged by each individual parent and by the parents collectively can give more or less room for the baby. In

dyadic research it has been shown that while communicating, an infant of 2 mo and his or her caregiver also regulate each other's interest and feelings. In the triadic interaction these phenomena are also of importance and will certainly have further implications for the child.

The use of CPICS gives an opportunity to explore in detail the interactions in the triadic family unit. CPICS can in its first step study the process of interaction, secondly describe this in different ways and finally describe how this early interaction may be related to various outcomes in child development and family processes. The knowledge of the emotional interaction pattern will help in the understanding of the implication of support and in developing interactions in families with clinical needs.

Triangulation

Triangulation stems from having a joint focus of attention. Tremblay-Leveau (28) observed and categorized two types of joint attention, called PPO and PPP. PPO describes a situation when either the child or the parent follows the gaze of the other towards an object, and thereby achieves joint attention. PPP is the same phenomenon, but instead of a physical object there is a third person. Tremblay-Leveau believes that the establishment of a triad is important to children in their development.

Fivaz-Depeursinge and Corboz-Warnery focused their observations on the infants' triangulation strategies during triadic play (2).

In CPICS triangulation has been chosen as the concept to indicate a special form of sharing or signalling interaction that goes on between the parents and the child. Both child and parents can initiate the triangulation. For example, when the infant is interacting with one parent and then wants to share with the other parent what is going on, triangulation is coded. In this moment the child can turn towards the other parent, and by this has the capacity to make a triangulation, and the parents can either affirm and follow the initiative or not. The individual parent can also initiate triangulation when interacting with the child by turning towards the other parent, and at the same time talking to the infant about that parent. If the child follows the initiative from the parent and looks as if he or she responds, this will be coded as a turn in the triadic interaction initiated by the parent. The initiative and response phenomena can be observed in the non-active parent in the way that he or she interrupts or supports the ongoing interaction. It is important to find a way to describe what goes on, and is important for the infant, when both mother and father are present in the interaction. Infants are different not only in dyadic situations but also in their competence in sharing with a third party. This may be evident from infancy. It is most important in analysing the early start, to find distinct ways in which the child is supported in joining into three-way interactions and feelings. Normative triangular interaction patterns are needed for clinical work.

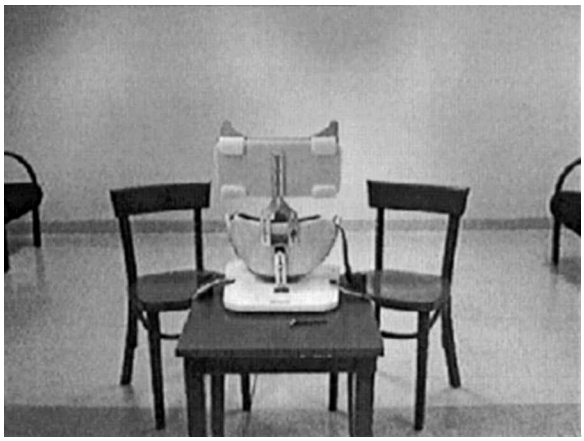

Fig. 1. Lausanne Triadic Play setting with the specially constructed chair placed on a table.

In relation to clinical work some important issues were considered in developing CPICS: In what ways are parents and infants helping each other to take part in a triadic communication? How are the separate contributions from infant and parents balanced with each other? How will we understand child development over time in relation to these aspects? Can we find risk factors and strengthening factors in communication?

Lausanne Triadic Play

The Lausanne Triadic Play (LTP) setting for the application of CPICS was developed to observe and describe how a child and his or her parents interact right from the beginning. The Getcef coding system (2) describes the degree of coordination that the partners can reach by playing together as a unit.

LTP consists of four parts, during which the family is placed in a triangle, with the parents sitting on each side of and in front of the child. The child sits in a specially constructed chair that resembles a child's car safety seat, and this chair is placed on a table. The chair can be directed towards the mother or the father or between them (Fig. 1). The situation is filmed with two cameras, one directed towards the parents and the other towards the child. The cameras are time synchronized. The special chair is used for children up to about 1 y of age; after this age another chair appropriate for the child is used.

The four parts of LTP are:

1. One parent interacts with the child while the other parent is sitting close by (third party). This is referred to as a dyad in the manual.
2. The parents change roles. The previously active parent is now the third party and the other one starts interacting with the child. This is referred to as a dyad in the manual.

Table 1. Reliability tests: rater agreement (Pearson correlation), international study, Lausanne Triadic Play (LTP) part 3.

LTP part 3: triadic interactions	20 Swedish families	20 American families (Seattle)	20 Swiss families, German speaking (Basel)	20 Swiss families, French speaking (Lausanne)
Child–parent				
Mother non-verbal affirmation	0.61	0.89	0.65	0.69
Mother verbal affirmation	0.52	0.92	0.86	0.55
Mother affirmation	0.77	0.91	0.82	0.61
Father non-verbal affirmation	0.57	0.63	0.25	0.80
Father verbal affirmation	0.56	0.73	0.74	0.70
Turn-taking	0.69	0.75	0.47	0.78
No. of turns	0.71	0.83	0.62	0.80
No. of contributions	0.82	0.76	0.61	0.85
Father–child				
Child response	0.58	0.73	0.38	0.40
Clarification	0.79	0.54	0.89	0.77
Awaits	0.58	0.13	0.89	0.77
Mother interrupts	0.83	0.73	0.52	0.56
Father affirmation	0.80	0.71	0.56	0.74
Turn-taking	–[a]	0.91	0.45	0.46
No. of turns	0.54	0.56	0.46	0.25
No. of contributions	0.54	0.78	0.51	0.55
Mother–child				
Child response	0.94	0.69	0.30	0.30
Clarification	0.89	0.87	0.48	0.78
Awaits	0.47	0.84	0.54	0.55
Mother affirmation	0.90	0.36	0.52	0.35
Father interrupts	0.83	0.81	0.74	0.78
Father affirmation	0.80	0.54	0.11	−0.02
Turn-taking	0.68	0.41	0.30	0.39
No. of turns	0.71	0.72	0.91	–[a]
No. of contributions	0.70	0.79	0.70	0.82
Synchronization				
Synchronized triad	0.75	0.98	1.00	0.97
Mother includes father	0.44	1.00	1.00	0.69
Father includes mother	0.64	1.00	1.00	1.00

[a] Very few observations.

3. Both parents interact with the child. This is referred to as the triad in the manual.
4. The parents interact with each other while the child is the third party.

The CPICS has been developed to study the mutual interaction of a new family on a micro-level, sequence by sequence. The focus is the contribution of both child and parents to the dyadic and triadic interactions. The focus on triads also exists in the dyadic interaction through coding of the focus of the third party. If a non-active parent supports, disturbs and/or interrupts the ongoing interaction this is also coded.

The following categories are used: initiative/contribution, non-verbal/verbal affirmation, naming with verbal affirmation, clarification, response, turn and turn-taking, tempo, inclusion versus exclusion, and synchronization.

Thus, the CPICS makes it possible to observe and analyse the four-part system: mother–child, father–child, mother–father–child and the parental system. Until the end of the year 2000, the CPICS has been used to observe families with children between the ages of 8 wk and 4 y.

LTP instruction

The following instructions are given to the parents:

In this exercise, we ask you to play together as a family. You will settle the baby in the seat and follow the directions for the four separate parts of this exercise. In the first part you choose who starts playing with the child; for example, you as a mother try to make your baby do what he (she) usually does with you, and during this time you as a father will simply be present. After a little while, when you feel ready, you can change roles: this is the second part. For example, you as a father can be with the baby, and you as a mother will simply be present. You can choose the moment to pass on to the third part in which you will both play with your baby together. In the last part, you will talk a while together and it will be your baby's turn simply to be present. Throughout these four parts you can decide who should begin playing with the baby, the length of each part, and the position of the table (centred on mother or father, or between the two). You can begin as soon as you feel ready and can give us a signal when the exercise is over.

Methodological aspects

The CPICS was developed to assess the results from the videotaped LTP sessions in a systematic way. As already described, the instrument and its categories are based on existing theories and hypotheses to describe the communication between the newborn child and his or her parents. It can be used with quantitative or qualitative parameters, for clinical purposes and for research. It was developed both for cross-sectional comparisons and to monitor the development of communication in the triad (by repeated assessments of the same triad) in projects using prospective longitudinal designs.

The following procedure is used. The LTP parts are videotaped. The video-counter is used to register the start and stop of events, and also an opportunity to register the length of time for single events and sequences. The assessments are done from the tapes, and 10–20 min of interaction is used. The observers should be trained using the manual, and an instruction videotape has been developed for this purpose.

The reliability of the assessments of different observers has so far (up to 2002) been tested in 80 families: 20 Swedish, 20 American, 20 German-speaking Swiss families and 20 French-speaking Swiss families. The observed children were only 3 mo of age on average when the assessments were done.

In the Swedish sample, all LTP categories from the four LTP parts have been included in the inter-rater reliability study (Tables 1, 2). In the four international groups, only LTP part 3, the triadic interactions when both parents are interacting with the child, were included (Table 1).

Two well-trained Swedish observers evaluated the videotapes independently of each other. Observer agreement was measured using Pearson correlation coefficients. Significant observer agreements were found in a number of comparisons, while low correlation coefficients were found in others (Tables 1, 2).

Categories of a quantitative nature show high correlation coefficients, while categories of a more qualitative nature show low correlation coefficients in some cases. Different explanations may be presented for these results. Only two observers were involved. Hypothetically, there may be cultural differences in the way in which parents interact with their newborn children, which are difficult to understand for people with only one cultural background. One example of this could be the father's role. In Sweden, over the past few decades, and for many different reasons, the father has become more actively involved in early child rearing. Special Acts have been passed by the Swedish parliament to facilitate this development. Such reasons, and perhaps other cultural reasons as well, could make it difficult for Swedish observers to interpret families from other countries in a correct way. In the forthcoming elaboration of the CPICS, such cross-cultural aspects are to be highlighted. Furthermore, as already mentioned, the observed children were only 3 mo of age on average when the assessments were done. At this low age it is fairly difficult to assess the interactions.

Table 2. Reliability tests: rater agreement, all other categories (Pearson correlation), Swedish study.

CPICS categories, LTP parts 1 and 2: dyadic interactions	Swedish families
Child–father	
Mother verbal affirmation	0.59
Mother non-verbal affirmation	0.70
Father verbal affirmation	0.76
Father non-verbal affirmation	0.78
Turn-taking	0.81
No. of contributions	0.91
Child–mother	
Mother verbal affirmation	0.54
Mother non-verbal affirmation	0.58
Father verbal affirmation	−0.07
Father non-verbal affirmation	0.52
Father affirmation	0.87
Turn-taking	0.70
No. of contributions	0.55
Father–child	
Affirmation of child response	0.76
Child response	0.12
Clarification	0.70
Awaits	0.56
Mother interrupts	0.79
Mother supports	0.86
Mother affirms	0.85
Turn-taking	0.72
No. of contributions	0.68
Mother–child	
Affirmation of child response	0.74
Child response	0.10
Clarification	0.54
Awaits	0.36
Father interrupts	0.63
Father supports	0.61
Father affirms	0.63
Turn-taking	0.66
No. of contributions	0.60
Synchronization	
Father overstimulates child	1.00
Mother overstimulates child	0.77
Synchronized father–child dyad	0.52
Synchronized mother–child dyad	0.46
Triangulation	
Child turns towards other parent	0.61
Dyadic interactions between parents, LTP part 4	
Talks about child	0.66
Shares feelings	0.18
Looks at child, father	0.84
Looks at child, mother	0.95
Child focus	0.89
Child tries to interact	0.51
No. of trials	0.97
Child sad, restless	0.88
Child is part of threesome	0.82
Transitions, LTP parts 1, 2, 3 and 4	
Initiator	0.74
Initiating non-verbally	0.33
Initiating verbally	0.34

LTP: Lausanne Triadic Play; CPICS: Child and Parents' Interaction Coding System.

It is probable that the communication and the categories will be easier to describe as the child and his or her abilities develop. As the child becomes older it will also be possible to validate the CPICS's different aspects of communication against other information stemming from the child him or herself. The samples from Sweden and Switzerland have been followed prospectively and videotaped six times until the children were 4 y of age. Data will be available later on, and the CPICS should be looked on as a "moving target" which will continuously be updated when new knowledge and insights emerge.

Until further experience is gained, and when using the CPICS with children at the age of 3 mo, correlations >0.69 are suggested as acceptable for scientific studies of groups. However, in clinical use, all categories should be used with great caution until reassessments support their reliability and validity.

Parts 1–3

Category: Child's contribution

The child's contribution during the different LTP parts (parts 1–3) is observed and registered in the assessment form (see Appendix p. 1, column I). (When assessing the observations on the child's contribution several pages may be needed. They should be numbered 1a, 1b, 1c, etc.) Note that when, for example, the child makes a contribution by looking at the parent, the facial expression is also coded, so that it will be possible to analyse the frequencies of different facial expressions during the play. For the child's contribution during LTP part 4, see *The child's focus in part 4*. These observations are registered in the assessment form according to Appendix p. 5.

The coding begins when the instructor has left the room and closed the door and/or when the parents have defined which of them should begin to interact with the child.

If the instructor returns this is scored as an interruption, but what occurs during the interruption is *not* coded. All interaction before and after the instructor entering the room *is* coded.

In LTP parts 1, 2 and 3, once the parents have decided who should begin interacting with the child, the child's focus of attention is coded as the child's first contribution.

The child's contribution is coded when the child shows different ways of contributing, e.g. with a contact initiative or direct focus on someone or something. This seems to serve as an entry point for the parents to make contact with the child.

Physical occurrences such as yawning or hiccuping are also counted as a child's contribution in the interaction.

Different types of child's contribution are coded (column I) with the numbers 1–11, as defined below. A child's contribution in the interaction can consist of several partial contributions. If the child smiles, seeks eye contact, directs his or her attention steadily to the mother and finally babbles, this is coded with 1, 4, 7 and 10 on the same row in column I. In this column time can also be registered, using the video-counter, when the contribution starts and stops.

1. Positive facial expressions, e.g. smiling with an open or closed mouth, alert eyes, open face.
2. Negative facial expression, e.g. scrunching of the face, frowning, pinched lips.
3. Neutral facial expression, e.g. resting face, no visible movements, no emotions shown.
4. Seeks eye contact.
5. Physical movement.
6. Attention directed towards an object.
7. Attention directed towards one of the parents.
8. Positive vocalization, e.g. laughter, babbling in a happy/loud pitch.
9. Negative vocalization, e.g. whining, crying, yelling.
10. Neutral vocalization, e.g., gurgling, babbling in a neutral pitch.
11. Coughing, sighing, hiccuping, etc.

Pooping, burping and hiccuping should be coded as a child's contribution the first time it happens, and the following occurrences only when the parents respond to it. Slobbering is not coded as a child's contribution, except when the parents verbally respond to it.

Infant contributions with the voice are called "vocalization" up to the age of 9 mo. At 18 mo they are called "verbal" and/or "vocal" contributions.

Subcategories

Third party's focus. The third party's focus is assessed when changes in the parent's facial expression and direction are observed during LTP parts 1 and 2 (Appendix p. 1, column II).

Affirmation. The most difficult part of describing the quality of the assessments is to find words to explain the difference between the parents' just acknowledging or responding to the child and also showing support and approval. To divide these actions into *verbal* and *non-verbal*, without losing the quality of what they were doing, the term "affirmation" was used when the parent responded to the child with a positive approval. There was also a need to code situations when the parent affirms the child in a specific event by putting words to the exact actions of the child. This becomes more important as the child grows older. Example of this are when the parent says, "Oh, you picked up that stone" or "It is beautiful". This implies both accepting the child as an individual and the focus or action of the child. It is also an opening to explore and go further. Such events are called "naming with verbal affirmation".

Therefore, the subcategory "affirmation" is categorized in three different ways: "naming with verbal affirmation", "verbal affirmation" and "non-verbal affirmation". They are registered in the assessment form (Appendix p. 1).

Naming with verbal affirmation is coded (mother column V, father column IX) when the parent, at the moment of the event, puts words to the child and/or what he or she does, e.g. "Yes! There's your hand" or "Oh, now you are sad" or "You're picking the yellow brick". This is not coded when the parent says something to the child with a neutral voice, e.g. "You are always so busy with your hands".

Verbal affirmation is coded (mother column IV, father column VIII) when the parent interprets the child as in the above example, or in another way verbally affirms that the child's contribution is understood, but not exactly at the moment puts words to it, e.g. when the child is cold and the parent says, "Yes it is cold here".

Non-verbal affirmation (mother column III, father column VII) from the parent is coded when the parent leans towards the child, for example. Reflection/imitation is also coded under this column. The parent may say something like "Hi", but the main emphasis should lie on the non-verbal affirmation. Some other examples are stroking the child on the cheek, following the child's focus of attention, smiling and giving the child a pacifier.

"Hmm" or similar is not a verbal affirmation but a form of emotional intonation, which is coded under non-verbal affirmation.

Wiping up vomit, snot or dribble or straightening out clothes without words or affirming facial expressions is not coded as a non-verbal affirmation.

Note: When the parent gives affirmation to a child's contribution without receiving a response from the child, and the parent repeats or clarifies the affirmation, the clarification is coded as affirmation. A child's contribution can be followed by a number of parental affirmations.

Note: When the child is absorbed with one parent and the child then turns toward the other in order to share his or her feelings or experience, this is coded as both a child's contribution and a triangulation.

The parent can turn a child's contribution into a triangulation. If this happens, it is coded under both triangulation and child's contribution (see Triangulation).

Turn(s)/turn-taking. Contributions such as affirmation, clarification and responses are defined as turns. When the child turns away or looks away as a pause, during an ongoing dialogue and then returns to the parent, it is coded not as a new child's contribution but as a turn within the same turn-taking sequence. If the child focuses somewhere else and becomes occupied with this, it is coded as a new child's contribution and a new sequence will start.

Turn-taking is a sequence of individual turns following the child's contribution. The number of turns in that sequence begins to be counted after the mother's or father's response to the child's contribution. The child should give a clear response, vocal or non-vocal, in order to be counted as a turn. The first turn is:

1. Child's contribution
2. Parents' affirmation
3. Child's response = the first turn in that turn-taking sequence.

If this is followed by a second affirmation from the parent, a new turn will take place. In this way, many turns could follow upon each other, establishing an emotional and communicative flow, an "I–you rhythm". This is defined as turn-taking and can consist of either just one turn or perhaps 10 turns.

Turn-taking sequences are not regularly observed and assessed in CPICS. However, CPICS gives an opportunity to do this. When the first two turns have been observed, turn-taking is counted by the individual turns registered in the column "Number of turns" on the first page in the assessments form (Appendix p. 1, mother column VI, father column X).

Category: Mother/father contributions

Mother/father contributions are coded under LTP parts 1, 2 and 3 (Appendix p. 2, column I).

The first parental contribution is coded when the active parent initiates contact with the child.

The contribution, which can be verbal or non-verbal, should be directed towards the child. It should have certain intensity.

When, during an ongoing interaction, a parent moves the child's chair to be better able to interact with the child, this is not coded as a parental contribution.

When the active parent changes the subject, this is often coded as a new contribution. *Note:* The infant does not understand the change in subject; look at the parent's way of changing the subject before the coding is made. If the conversation flows despite the subject change, this is coded not as a new contribution but as turns in turn-taking.

Type of parental contribution is coded with numbers 1–11, as defined below. Parental contribution can consist of several different contributions at the same time, e.g. 1, 4, 6 and 7, as described for the child in Child's contribution, above.

1. Positive facial expressions, e.g. smiling with an open or closed mouth, alert eyes, open face.
2. Negative facial expression, e.g. scrunching of the face, frowning, pinched lips.

3 Neutral facial expression, e.g. resting face, no visible movements, no emotions shown.

4. Seeks eye contact.

5. Physical movement is coded when the parent touches the child.
6. Initiates an object.
7. Directed towards the child.
8. Verbally positive, e.g. laughter, talking with a tempting pitch.
9. Verbally negative, e.g. harsh or angry voice.
10. Verbally neutral.
11. Seeks information about the child's focus of attention (see explanation below).

When the parent, without affirming or taking an initiative, seeks information about the child's focus of attention, this is coded as a parental contribution. In the analysis it is regarded as a parental behaviour. For example, the child sits with down-turned head and face, the parent leans forward and looks for information such as "Are you awake?" "Are you asleep?" or "What are you looking at?"

Subcategories

Third party's focus. The third party's focus is coded when a change in the focus of the non-active parent takes place, during LTP parts 1 and 2 (Appendix p. 2, column II).

Wait for child's response. Mark X in the Yes or No square on Appendix p. 2, column III, under the "Waits": the child should be given a chance to receive or take in the parent's contribution, process it and respond; the parent should actively wait for the child. For example, "Hi, how are you?" . . . (Pause) . . . "How are you?"

Clarification. When the parent continually tries to contact the child using his or her own contribution without getting a response from the child, these attempts are coded as a clarification (column IV) and not as a new parental contribution. A parental contribution can be followed by a number of clarifications. The parent can clarify his or her initiative by repeating and/or intensifying the contribution, by using the child's name and/or interjections. The parent can vary his or her pitch and/or vary the theme for his or her contribution.

When a parental contribution becomes action, the action is coded as a clarification; for example, the parent says to the child "Shall we sing?", the child does not respond and the parent begins to sing.

Child's response. When the *child responds*, mark X in the indicated square. Note that one parental contribution can be followed by several responses from the child (column VIII).

If an active parent affirms the child's response, mark X in the indicated square (column IX).

When a non-active parent affirms the child's response, mark X in the indicated square. Note that one child's response can be followed by several parental affirmations.

When a non-active parent in part 3 enters an ongoing interaction through an affirmation of the child, this is coded as a non-verbal affirmation/verbal affirmation of the child and not as a parental contribution.

Make a qualitative assessment of the synchronization of the dyad by marking X in the indicated square (see Synchronization, below).

Turn(s)/turn-taking. (Appendix p. 1, columns VI and X, and p. 2, column XI.) Counting of turns in turn-taking begins after the parental response to the child's response, as follows:

1. Parental contribution.
2. Child's response.
3. Parental response.
4. Child's response = turn 1 in the turn-taking.

This example in LTP part 3 is further illustrated on the video. The mother is smiling and the child responds with a smile, to which the mother responds with further smiling, and the child starts happily babbling, while the father is overlooking this with smiles and vocal support. This sequence initiated by the mother is registered as follows. The mother's first smile on Appendix p. 2, column I. The child's first response, a smile, on Appendix p. 2, column VIII. The mother's response, a smile, on Appendix p. 2, column IX. The child's babbling (the first turn) on Appendix p. 2, column XI. The father's overlooking with smiles and vocal support is registered on Appendix p. 2, columns VII and IX. If further turns follow within the same theme, this is registered as above on Appendix p. 2. The number of turns is finally recorded in column XI.

If new turns follow from new contributions, with new themes, they are registered on either Appendix p. 1 or Appendix p. 2, depending on whether the child or one of the parents made the first contribution.

In the turn-taking the child should give a clear vocal and/or non-vocal response for it to be counted as a turn.

During the song, singing games and movements turns are not coded when the child is 12 wk old. Singing games and movements are coded as turns at the age of 36 wk if there is a flow between child and parents when carrying out the movements, e.g. alternative movements, child or parent follows or mirrors the other's movements, or they exchange smiles

Partner interrupts/disturbs/supports. This is coded in LTP parts 1, 2 and 3 (Appendix p. 2, columns V, VI and VII).

Partner interruption is coded when either the child or the active parent is disturbed by the non-active parent's actions.

Partner disruption is coded when the non-active parent interrupts and seeks contact with the child or with the active parent, or in other ways tries to change the ongoing interaction, even if the child is not disturbed

by the parental action and the ongoing interaction continues.

Partner support is coded when the non-active parent, through facial expression, body language and/or verbally, conveys to the child and/or partner that he or she supports the ongoing interaction.

When the non-active parent is simply there, no coding is made.

Category: Triangulation

Triangulation is coded under LTP parts 1, 2 and 3 (Appendix p. 3, columns I–V). Triangulation can be initiated by either parent and/or by the child.

Subcategories

The parents initiate the triangulation. The parents triangulate the child verbally and/or non-verbally to the other parent.

The active parent can include the other parent in the interaction with the child by tone of voice, facial expressions and eye movement, thereby directing the child's focus towards the other parent. If the child does not focus on the other parent, this is not coded as a triangulation even if the parent makes an active triangulation.

The non-active parent calls the active parent and child, and the child acknowledges by pitch, facial expression or eyes and/or by way of sounds/words.

An invitation to a non-active parent to participate in the interaction is not coded as a triangulation if the child does not understand it as such; it is thus more an invitation between adults.

When the parent tries to triangulate the child to the other parent and the effect on the child is so late that it does not become part of the sequence, this is not coded as a triangulation.

The parent can turn a child's contribution into a triangulation; this is coded under both triangulation and child's contribution. For example, the child is active with the father, looks towards the mother, the father says, "Yes, there is mother" and the child turns back to the father.

The child initiates the triangulation. The child is focused on one parent and turns to the other to share his or her feelings or experiences. To code a sequence as child triangulation, the following steps need to be present.

The child has to be focused on one of the parents. The child should then actively interact with the other parent by turning towards that parent, using facial expressions, noise or movement. This must be an active initiative from the child and not just a chance occurrence. The child then has to return his or her focus to the initial parent without prompting. If the "second" parent returns the focus of the child to the "first" parent, it is coded not as a child triangulation, but as a parental triangulation.

When coding "The child is focused on one parent and turns to the other in order to share his or her feeling/experience", this is also coded as a child's contribution. Thus, this is coded in two places.

Summary assessments of the triad (Appendix p. 4)

Note the time when the triad interaction starts. Also, note the time when the triad interaction stops.

Make a quantitative assessment of whether all three are participating more than 50% of the time and mark X in the indicated square.

Judge whether the each parent includes or excludes the other, and mark X in the indicated square. Note that one parent can include the other parent, while the other parent excludes his or her partner. For explanations see *Parental cooperation*, below.

Judge qualitatively whether the child becomes overstimulated by too many initiatives from the mother or the father. Mark X in the indicated square.

Synchronization

Synchronization is coded in dyad and triad interactions. In LTP parts 1 and 2, coding is made in Appendix p. 2 (squares at the bottom of the page) and in LTP part 3 on Appendix p. 4.

Make a qualitative assessment of the synchronization of the triad and mark X in the indicated square.

The synchronization is coded from the perspective of emotional engagement and interactive flow between the two or the three partners, respectively. The parents actively invite each other to the interaction and/or triangulate each other to the child. The parents include each other in the interaction.

In the triad, there is attentiveness from the non-active person towards the ongoing interaction. Does a dance of interaction arise when the parties have the place and the room to express themselves? Do the turns of the parties interlace or do they appear as one-way dialogues? Both the child and the parents contribute to the synchronization of the dyad/triad. Are all dyads in the triad activated? The parents' and child's pace should match, e.g. verbally/vocally and non-verbally/vocally.

The child restfully shifts glances between the parents in the triad interaction. This can either occur when the child is absorbed with one parent and turns towards the other parent in order to share, but also when the child, with a glance, takes in first one and then the other parent.

Synchronization is assessed and coded Yes (1), Mostly (2), Partly (3), No (4).

Parental cooperation in the triad: inclusion–exclusion of the partner

(Appendix p. 4). Inclusion is coded when:

(a) the parent gives verbal, non-verbal and physical space to the other's interaction/activity with the child;
(b) the parent supports passively and/or actively verbally, non-verbally or physically the other's interaction/activity with the child;
(c) the non-active parent is absorbed in the other parent's interaction/activity with the child (e.g. verbally or by showing a clearly directed focus and/or facial expressions).

Parent's cooperation (including the other) is coded when the above-mentioned is responded to with yes more than 50% of the time. A parent can be judged to cooperate/include while the other is judged to exclude. *Exclusion* is coded when:

(a) one parent is bodily excluding the other parent, e.g. by leaning forward;
(b) one parent is turning the baby-seat towards him or herself;
(c) one parent interferes with the ongoing interaction between the child and the other parent.

Co-parenting demands high degree of sensitivity. It needs respect for the different partners' contributions and a sensitivity which supports the other partner's interaction or contribution. This can be observed in the distribution among the three family members of contributions, responses, affirmations and clarifications.

The child becomes overstimulated

Overstimulation is coded when the child reacts by turning away, closing its eyes or shows signs of stress. This phenomena can happen in all parts but is here coded only in part 3. The reason can be:

(a) parents are not cooperating in balancing their initiatives towards the child;
(b) individual communication patterns like for example not waiting for child response;
(c) parents are not sensitive enough to the child's state or mood.

Some children are more easily overstimulated while others children are not sensitive to it.

Part 4

The child's focus in part 4

(Appendix p. 5). Does the child have his or her focus directed towards the parents more than 50% of the time? Make a quantitative judgement and mark X in the indicated square.

Is the child anxious/distressed more than 50% of the time? Make a qualitative judgement and mark X in the indicated square. The child can express anxiety/distress both verbally and non-verbally.

Does the child seem to be participating? Make a qualitative judgement and mark X in the indicated square. The body, facial expression, eyes or sound can convey the sense of participation.

Does the child actively try to come in contact with the parents (socially directed behaviour)? The child, through facial expression, voice, pitch or movement, must convey that he or she actively tries to do so. Code the attempt to initiate contact with the numerical designation: type of contribution can consist of several different contributions at the same time, e.g. 1, 4, 10. Note also here, as for child contribution in parts 1–3, that the child may have a social directed behaviour such as positive vocalization, but the facial expression is coded and the body may also be directed towards the parent.

1. positive facial expression
2. negative facial expression
3. neutral facial expression
4. the child actively seeks eye contact with a parent
5. physical movement which is not directly directed to the parents, e.g. repetition of game/song movements, which parents and children used in the triad interaction
6. physical movement directed towards the parents, e.g. the child stretches his or her arms towards the parents or leans towards the parents
7. body/face directed towards one of the parents
8. positive vocalization
9. negative vocalization
10. neutral vocalization

As the child's contribution in part 4, do not code just crying as an active attempt to interact.

The parents' focus in part 4

(Appendix p. 6). Mark each glance from mother and/or father towards/to the child with a line, then add the lines together and mark the number in the indicated square.

If the parents talk to each other about the child more than 50% of the time, make a quantitative judgement and mark X in the indicated square.

If the parents share feelings around the child more than 50% of the time, make a quantitative judgement and mark X in the indicated square. The sharing can be verbal or non-verbal.

Under Comments, give a general clinical view. What is the atmosphere like? How are the parents sitting? Are they turned towards each other? Towards the child? When they talk about the child is it in positive, neutral or negative terms? What feelings do they share: positive, neutral or negative?

Category: Transitions and conclusions

(Appendix p. 7, columns I–VI). The video-counter is used to register transitions between the different LTP parts and the conclusion. The counter's value when the event occurs is registered in the appropriate column. The coding is based on observing how the parents handle the transition situations with the child and with each other.

Does the active or the non-active parent initiate the transition? Is the transition initiated in relation both to the child and to the partner? To whom is the transition initiated, and does it take place verbally or non-verbally or both?

The transitions (initiates, indicates, approves) are coded as a separate part and are not included in the dyad/triad interaction coding. What occurs during the transition period, in terms of child–parent contributions and responses, is not coded.

Cross over the alternative M/F (mother/father) to indicate the initiator of the start and conclusion of the transition. Mark also the initial counter-value. Then mark successively the counter-values in the respective columns when the events occur.

At the start and conclusion of the transition, the turning of the child's chair is coded. This is a clear indication of changed focus.

The start of the transition is coded when a parent takes the initiative to interrupt the triad/dyad, even if the other parent delays his or her verbal and/or non-verbal affirmation.

A transition is coded as finished when the receiver or deliverer bodily indicates his or her withdrawal or participation.

Add comments on the conclusion: make brief notes on the child's condition. How does he or she sit? Is the child tired, unhappy, angry, contented, etc.? Does either parent lift the child out of the chair?

Comments on the whole tape-recording

The tape-recording from the LTP parts gives overall information about the child and the communication. Such observations should be commented upon on a separate sheet. The following should be described:

- the child's vigour
- the child's posture in the chair
- the child's general condition
- the overall emotional atmosphere in the triad
- other comments.

Final comments

The CPICS is an instrument with which the interaction in the triad (the newborn child, mother and father) can be described from quantitative and qualitative parameters when using the Lausanne Triadic Play (LTP). Tables 1 and 2 describe the inter-rater reliability obtained when two experienced observers rated the different parameters in the four groups included in the international ongoing study. The assessment forms are described in the enclosed Appendix.

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Family:
LTP week:
Coded by:
Page:

Child Contribution Part .....

Positiv facial expressions = 1
Negative facial expressions = 2
Neutral facial expressions = 3
Seeks eye contact = 4
Physical movement = 5
Attention directed towards object = 6
Attention directed towards parent = 7
Positive vocalization = 8
Negative vocalization = 9
Neutral vocalization =10
Cough, sigh, hiccup, etc = 11

I. Type of contribution shown by child	II. Third party`s focus	III. The mother nonverbally affirm the child's contribution	IV. The mother verbally affirm the child's contribution	V. The mother names with verbal affirmation the child's contribution	VI. Number of turns	VII. The father nonverbally affirm the child's contribution	VIII. The father verbally affirm the child's contribution	IX. The father names with verbal affirmation the child´s contribution	X. Number of turns

Synchronization: ☐ Yes ☐ Mostly ☐ Partly ☐ No

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Family:
LTP week:
Coded by:
Page:

M / F contribution Part .....

Postive facial expression = 1
Negative facial expression = 2
Neutral facial expression = 3
Seeks eye contact = 4
Physical movement = 5
Initiates object = 6
Attention directed towards the child = 7
Verbally positive = 8
Verbally negative = 9
Verbally neutral = 10
Seeks information about the child's focus = 11

I. Type of contribution shown by M / F	II. 3:e party`s focus	III. Waits		IV. Clarification	V. Partner interrupts	VI. Partner disturbs	VII. Partner supports	VIII. The child gives a response	IX. Affirm the child´s response		X. Waits for the child`s response	XI. Number of turns
		Yes	No						M / F	Partner		

Synchronization: ☐ Yes ☐ Mostly ☐ Partly ☐ No

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Family:
LTP week:
Coded by:
Page:

Triangulation part .....

I. The father nonverbally directs the child to the other parent	II. The father verbally directs the child to the other parent	III. The mother nonverbally directs the child to the other parent	IV. The mother verbally directs the child to the other parent	V. When the child is engaged with one parent it turns to the other parent to share its feelings/experience

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Family:
LTP week:
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Page:

The triad part 3

Point of time when the triad begins: ☐

Point of time when the triad ends: ☐

Is everybody participating more than 50% of the time? ☐ Yes ☐ No

Synchronization:
- ☐ Yes
- ☐ Mostly
- ☐ Partly
- ☐ No

Including - Excluding

Mother includes father ☐ Yes ☐ No
Father includes mother ☐ Yes ☐ No

Overstimulating

The child becomes overstimulated because the mother takes too many initiatives ☐ Yes ☐ No
The child becomes overstimulated because the father takes too many initiatives ☐ Yes ☐ No

Family:
LTP week:
Coded by:
Page:

The child`s focus during part 4

Is the child`s focus addressed to the parents more than 50% of the time? ☐ Yes ☐ No

Does the child attempt to interact with the parents? ☐ No

☐ Yes Number of times: = ☐

Is the child restless/sad more than 50% of the time? ☐ Yes ☐ No

Does the child give a picture of being/feeling participating? ☐ Yes ☐ No

Comments:

The child attempts to interact with the parents by:
1= Positive facial expressions
2= Negative facial expressions
3= Neutral facial expressions
4= Seeking eye contact
5= Physical movement
6= Physical movement corrected towards the parent
7= Body/face directed towards one of the parents
8= Vocal / Verbally positive
9= Vocal / Verbally negative
10=Vocal / Verbally neutral

Family:
LTP week:
Coded by:
Page:

The parent`s focus during part 4

Do they talk about the child more than 50% of the time? ☐ Yes ☐ No

Do the parents share feelings around the child more than 50% af the time? ☐ Yes ☐ No

Number of glances towards the child from the mother ---------- = ☐

Number of glances towards the child from the father ---------- = ☐

Comments:

Family:
LTP week:
Coded by:
Page:

Transitions and conclusions

		I. Initiator	II. Initiates verbally	III. Initiates nonverbally	IV. Initiator verbally indicates the changeover to the child	V. Initiator nonverbally indicates the changeover to the child	VI. The other parent approves the changeover
LTP part 1	M						
	F						
LTP part 2	M						
	F						
LTP part 3	M						
	F						
LTP part 4	M						
	F						
Conclusion	M						
	F						