Title: Quality of social interaction in foster dyads at child age 2 and 3 years

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Running Head: Quality of social interaction in foster dyads

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Abstract

The main aim of this study was to investigate the quality of social interaction between 60 foster parents and their foster children compared to a group of 55 non-foster families at 2 (T1) and again at 3 (T2) years of age. Video observations were used to investigate child–parent interaction at both time-points. "This is My Baby" interview was administered to investigate foster parents' commitment at T1. The main results revealed significant group differences at T1 on all child–parent social interaction measures, although not at T2. Further, a significant group by time interaction was identified for parental sensitivity, revealing a positive development over time in the foster group. Finally, a significant positive relation was found between commitment at T1 and parental sensitivity. The results convey an optimistic view of the possibilities for foster dyads to develop positive patterns of social interaction over time.

Keywords: foster care; child–parent interaction; sensitivity; commitment

Introduction

Children in the welfare system, including foster children, often have a history of maltreatment and change of caregivers and thus may be considered at high-risk for aberrant development [1, 2]. Extant research has shown that foster children may be at risk for delayed physical development and mental health problems, as compared to children living with their biological parents [3-6]. Due to their often problematic background, and in order to prevent possible developmental difficulties, it is of great importance to provide foster children with sensitive and committed caregivers who can render a fully adequate caregiving environment [7, 8]. The quality of infant attachment has been linked to the caregiver's sensitivity [9], and placing children at an early age in foster care has been shown to increase the possibility for developing secure attachment to the new parents [10, 11]. Whether similar improvements are possible over time also when assessing dyadic caregiver-child interaction, has been given less attention. Because foster care is a frequently used option in many countries when children need new caregivers, it is important to investigate foster parents' sensitivity, foster children's emotional functioning in child-parent social interaction over time, as well as foster parents' commitment to their foster children.

Parental sensitivity, which is a main concept in parent-child interaction, has been defined as the caregiver's ability to identify and respond to the child's signals in an adequate way [12, 13]. Mary Ainsworth was one of the first authors to define the concept of sensitivity. She conceived sensitivity as a mother's ability to perceive and accurately interpret the child's signals and communicative behavior, and then to respond to these signals quickly and adequately [12]. Ainsworth and her collaborators took into consideration how a mother responds to her child's signals when the child is distressed, in addition to social signals in feeding, play and other daily experiences in interacting with the child. In this way, the caregiver provides the child with supportive sensitive emotional regulation, both during

distress and joy, subsequently helping the child to master such regulation on its own in a stepwise manner [13-15].

An early developmental challenge to the infant is how to signal its needs to the caregiver(s). If the caregiver responds sensitively and adequately, the social world may become a predictable place where the infant's needs are met. This adaptation proceeds in the reciprocal co-regulation that takes place in the daily interactions between caregiver and infant [16, 17]. Infants are completely dependent on sensitive caregivers who attend to their physiological and emotional needs [18, 19]; hence, young children's ability to master their inner feelings, especially in infancy and early childhood, is dependent to a large degree on the caregiver's sensitive care [20].

In foster care, sensitive parenting may be a challenge because the foster child often has experienced insensitive care prior to placement. Thus, foster parents may have difficulties identifying the children's signals, which are often inappropriate due to their early adverse social experiences [21]. In addition, such children often are genetically vulnerable or may have experienced toxic prenatal factors detrimental to development [22]. Foster children are also more prone to somatic illness [5], thus making it more challenging for foster parents to provide sensitive care.

In addition to the need for stability of care and committed caregivers, Bernard, Meade and Dozier [23] described the need for parental nurturance and synchrony as two different dimensions in parental sensitivity. The foster parent's ability to meet these needs, especially nurturance [24], is seen as essential for promoting positive child development. This ability may have a *therapeutic* function for the child and enable the caregivers to behave as "therapeutic" parents [24]. Nurturing care implies meeting the child's needs in distress situations when the individual signals a need to be soothed when experiencing unpleasant feelings, such as being sad or hurt. Synchronous care can be defined as following the child's

lead in interactions and helping the child to maintain its perspectives and goals [23, 25]. Although describing synchronicity as an important part of parental care, such a definition includes the child as an active partner in a dual relationship, as outlined in the paper of Harrist and collaborators [26]. The relationship dimension has also been pinpointed by Leclere, Viaux, Avril, Achard, Chetouani, Missonnieret al [27]. Synchronous care helps to meet the child's needs in non-distress situations, such as during exploration and play. Bernard, Meade and Dozier [23] state that synchronicity seems to have a strong influence on the child's regulatory capacities, whereas nurturance appears to have more of an effect on the development of a secure attachment relationship towards the caregiver. This definition of nurturance is similar to what Bowlby called the need for a secure base when the child is exposed to danger and stress [28]. The child's needs of parental nurturance and synchronicity are based on the theoretical and empirical principle that the caregiver co-regulates the child's emotions in order to help it to become more self-regulated [13, 14].

The child's emotions, positive or negative, should therefore be considered when investigating the parent-child relationship over time. To the authors' best knowledge there is a scarcity of information about how child positive and negative mood or affect towards their foster parents develop over time. However, neglecting care may lead to challenges in children's emotion regulation, such as externalizing behavior [7, 29]. As foster children evince a higher prevalence of behavior problems [6, 30], it may be assumed that foster children also might show less positive and more negative mood toward their new caregivers and concomitant difficulties in emotion regulation. Problem behavior, characterized by less positive mood or affect in the relationship to caregivers and others, has been found to be associated with placement breakdown [2]. Thus, enhancing positive mood might be beneficial for the foster child–foster parent relationship. Supporting social interaction in foster dyads has also been advocated by Dubois-Comtois, Bernier, Tarabulsy, Cyr, St-Laurent, Lanctôtet al

[31]. These authors concluded that high quality interaction, enhancing emotional expression, responsivity/sensitivity, tension, and mood, was important for the foster child's functioning. When caregivers were supportive and the interactions harmonious and pleasant, the foster child was better socially adjusted.

The other necessity emphasized by Dozier, Zeanah and Bernard [13] is the need for a stable placement, where the foster parents are emotionally highly *committed* towards the child. Becoming committed to an unknown child who often has a history of maltreatment can be a challenge for many foster parents. Becoming committed implies that the foster parent signals that the relationship is meant to last over time, and that they show evidence for wanting to care for this particular child [32]. Commitment may be understood as the caregiver's wish to be a parent for the child forever; such commitment answers the biological need of the child to survive. Foster care is not always meant to represent a long-lasting relationship between the child and his/her new caregiver(s) and may therefore represent a challenge for many foster parents. In this vein, Bernard and Dozier [33] reported that foster parents' commitment predicted the degree of delight they showed towards their foster children, implying that highly committed caregivers tend to show more delight in the relationship than do less committed ones [33]. Delight has also been described to play an essential role in the child–parent attachment relationship. As described by Powell, Cooper, Hoffman and Marvin [17], reciprocal sharing of affect when looking into a parent' face and eyes while showing happiness, is a way of knowing that emotion expressions can be shared.

As to commitment, commitment and parental sensitivity have been described as two different parts of parental care, but as far as we know, the relation between these two concepts has not previously been investigated. Although commitment is not necessarily part of sensitive caregiving, delight elicits a reciprocal positive affect in the child. In the three boxes procedure used in the present study, positive regard was specified as parental positive

expression and attitude towards the child [34]. It may be equivalent to delight, as previously described in a study by Caron, Bernard and Dozier [35], and therefore part of parental sensitivity in our study. In the study by Caron and collaborators the Attachment and Biobehavioral Catch-Up intervention was used to increase parental nurturance and synchronicity.

As many foster children are placed in long-term foster care and thus meant to stay in their new family for a longer time, there is a need to understand the dynamics of social interaction between the foster parent and the child. In line with a transactional model of development [36], emphasizing the contributions of the caregiver (e.g. caregiver sensitivity) and the child (e.g. child positive and negative mood), in addition to foster parental commitment, it is important to throw more light on the development of dyadic social interaction over time.

The present study

The main aim of this study was to investigate the quality of social interaction between foster parents and their early placed foster children when the children were seen at age 2 (T1) and again at age 3 years (T2), as compared to a group of low-risk non-foster families. A second aim was to investigate the possible association between foster parents' commitment and parental sensitivity.

The following hypotheses were investigated:

1. Over all, the quality of social interaction (parental sensitivity, child positive and negative mood, and parent–child relationship) will be lower in the foster group as compared with the non-foster group at the ages of 2 and 3 years.

Social interaction

2. Over time, the quality of social interaction will increase in the foster group, which will evidence a catch-up with the non-foster group, although perhaps not completely.

3. Highly committed foster parents at child age 2 years will be more sensitive in their relationship with their foster children during follow-up than foster parents who are less committed.

Method

Participants

The present sample is part of an ongoing longitudinal study consisting of two groups of children and their caregivers: one foster care group and one non-foster comparison group and includes data from two time-points. Our goal was to include young foster children and to investigate their development in different areas of functioning over time. We aimed to include the children as young as possible based on statistics of Norwegian foster children. Further, the children should have stayed in the present foster home for at least two months. This decision was based on previous research on foster children's ability to establish an attachment relationship with their new caregivers [37, 38]. Moreover, the foster children had to be in long-term foster care to be included in the study. The number of children was somewhat higher at T1 in both groups; the foster group included 60 children (24 girls), and the non-foster group 42 children (21 girls). At T2, there were 56 (21 girls) and 40 (21 girls) children in the two groups, respectively. Due to technical problems with the video-observations, 55 (20 girls) foster children were included in the main analyses. The mean age of the children in the foster group at T1 was 23.3 months (*SD* 0.61), ranging from 22 to 25 months, and at T2, 35.2 months (*SD* 0.41), ranging from 34 to 36 months. The mean age of the children in the non-foster group was 23.2 (*SD* 0.5) ranging from 22 to 24 months and at T2 35.2 (*SD* 0.4) ranging

from 35 to 36 months. Most children in both groups were of Norwegian ethnicity; 46 (76.7%) and 39 (92.9%), respectively.

One of the parents was chosen as the primary participant based on information on whom the child usually turned to when having attachment needs (e.g. was frightened). In both groups the main participants, who were the ones who took part in the observed interactions, were primarily females (foster group 55 females, non-foster group 39 females). The caregivers in both groups were typically married; 48 (80.0%) in the foster group, and 26 (66.7%) in the non-foster group. At T1 101 (99.0%) of the families were two-parent households. Most of the main participants in both groups had a high level of education (n=67, 66.3%), which means that they had two years or more of full-time education in addition to secondary school. However, a significant group difference in education was identified $\chi^2(2) = 14.5$, $p < .001$: about half of the foster parents had high education, 31 (51.6%), whereas the number of caregivers in the non-foster group with low education was 36 (87.8%). The main participants in the foster group were significantly older than those in the non-foster group (37.7 vs. 33.7 years) $t(98) = 4.04$, $p < .001$, *diff* = 4.03, 95% CI [2.05, 6.02], and the foster families in had significantly more children (2.5 vs. 2.0) living in the household at T1 $t(98) = 2.02$, $p = .046$, *diff* = .48, 95% CI [.01, .94].

Based on the foster mothers' reply, among the foster families (n=59) only eight families (13.6%) had previous experience with fostering children. Twenty-one (35.0%) of the foster families had no children of their own, 15 (25.0%) had one child and 24 (40.0%) had two children or more. Further, 52 (88.1%) of the main participants in the foster group reported to have participated in the Pride training program [39] before they became foster parents. Pride is a 10-session program developed to prepare prospective foster parents for the role as foster parents and to be able to reflect on their own contributions in the foster parent–foster child relationship and the various needs of a foster child. As regards supervision as foster

parents, 14 (24.1%) of the main participants had not received any kind of guidance before the first data collection (T1).

As shown in Table 1, the foster children were placed in their first foster home, as well as in their final foster home (where they currently were living) at a young age; they had been living in the current foster home on an average of 15 months. Most of the foster children experienced two (*n*=33, 55%) placements, and eight children (13.3%) had experienced three or more placements, including the current foster home. They had visitations with their biological parents at an average of 6.5 (*SD* 4.0) times a year, ranging from zero to 18. Nine (15%) of the foster children were placed in foster care due to some type of abuse (physical, emotional or sexual) before placement. Five (8.3%) children were placed in kinship care.

Data on attrition was not systematically collected. In the foster group, some of the reasons for not participating at T2 were: the foster family had received a new foster child that needed intensive medical care, the family did not approve the methods that were used, or the child was moved to a new foster home. Reasons for withdrawal in the non-foster group were not possible to identify due to loss of contact from T1 to T2.

Insert Table 1 here

Procedures

The foster children and the families in the non-foster group were recruited throughout Norway during 2009 and 2010. Sixty foster families and 42 non-foster families were included. The children and their foster parents were recruited through contact with the community Child Protection Services (CPS), and the families in the non-foster group mostly through day care centers. The participants in the non-foster group had not received any support from the CPS before recruitment to this study. Both the CPS and foster parents gave their written informed consent to participate, as did the parents in the non-foster group. The Norwegian Ministry of

Children and Equality consented to recruit foster children in the care of the CPS without permission from the biological parents. Thus, informed consent from the foster children's biological parents was not needed. Both the CPS and the foster parents gave written informed consent to participate in the study. For more details, see Jacobsen, Moe, Ivarsson, Wentzel-Larsen and Smith [40]. Most observations and tests were done in a laboratory setting during a single day, whereas questionnaires were mostly filled out at home after the observations were completed.

Measures

The Three Boxes Procedure is a semi-structural procedure for video-observation of the caregiver–child interaction. It was originally developed by the National Institute of Child Health and Human Development Network (NICHD) [41], and further developed by Owen, Amos, Bondurant, Caughy, Hazanizadeh, Hurst [34]. The observation includes three sets of toys, and the parent is told over the course of 15 minutes to engage the child in play with the toys in a certain order, and to play as they usually do at home. In this study, the first task was an age-appropriate book, the second a microwave oven with play food and the third a small animal park. Validity of the Three Boxes Procedure has to some extent been explained by Owen, Ware and Barfoot [42]. Referring to an NICHD study [43], Owen and colleges report that ratings of mother-child interaction observed with the same 15 minutes procedure that has been used in our study significantly predicted children's social outcomes. Further, stability from earlier child ages to 36 months of age was reported for the maternal ratings, with cross time correlations ranging from .41 to .48 [41].

The rating system consists of six parental scales: sensitivity/responsivity, intrusiveness, detachment, cognitive stimulation, positive regard and negative regard, plus four child scales: child positive mood, child negative mood, sustained attention and engagement of parent. Additionally, a global scale assessing the quality of relationship has

been included. All scales are rated on a five-point Likert scale, ranging from 1 = not at all characteristic to 5 = highly characteristic. The sensitivity/responsivity scale focuses on how the parent observes and responds to the child's social gestures, expressions, and signals as well as their responses to signs of frustration, confusion, irritation, and signs of negative affect. Detachment measures the parent's awareness of, attention to, and engagement with the child. Positive regard rates the parent's positive feelings toward the child, expressed during interaction with him/her. Child positive mood assesses the extent to which the child is satisfied, content, and pleased with the situation overall. Measures of child positive affect include smiles, laughter, and positive tone of voice, as well as enthusiasm expressed with body movement and facial expressions. Child negative mood assesses the child's negative affect in the interaction, more precisely the extent to which the child cries, fusses, frowns, tenses the body while crying, throws "temper tantrums", or otherwise expresses his/her discontentment. As most literature uses affect and not mood, these two concepts will be used interchangeably. Lastly, the quality of relationship scale is a dyadic, global scale focusing on the affective and reciprocity aspects of the parent-child relationship [34].

At T1, 102 video observations, eight of which were used for training, were coded by three persons trained by Margaret Owen. Two of these individuals coded the complete data set (main coders), while the third one coded 30 randomly chosen observations across the complete set (except for the training cases) for the purpose of interrater reliability. The same persons also coded the video clips at T2. Due to low interrater reliability at T2, the second and third authors (main coders) who both had been trained by the first author (certified by Margaret Owen), recoded the 95 video clips, including seven that were used for training. Furthermore, 24 randomly chosen observations, again selected from the complete data set (except for the training cases), were double coded by the same two individuals for interrater reliability. Reliability coefficients were calculated on the basis of each coder's originally

scores. The training clips were coded by all persons at T1 and T2, respectively, and where consensus had been obtained the consensus scores were included in the analysis. In all other cases, the main coders' results were used. All coders (at T1 and T2) were blind to group identification, and the main coders did not know which clips belonged to the reliability set. Regular coding meetings were held to prevent coder drift. One family was excluded at T2 due to technical problems when no video-recording was obtained. The following scales were selected for inclusion in the study: sensitivity/responsivity, positive regard, detachment, child positive mood, child negative mood and quality of relationship. In addition, we intended to report on parental intrusiveness and child engagement of the parent, but due to low interrater reliability these scales were not included (.74/.36 and .15/.99 at 24 and 36 months, respectively). Interrater reliability was calculated as weighted kappa with quadratic weighting. The coefficients at T1 were: sensitivity/responsivity .78, positive regard .52, detachment .74, child positive mood .61, child negative mood .70 and quality of relationship .70. At T2: sensitivity/responsivity .96, positive regard .89, detachment .83, child positive mood .81, child negative mood .99 and quality of relationship .84. All weighted kappa coefficients were acceptable according to Cicchetti [44]. At both time points the persons who coded the video clips did it independently of each other and were blind to group identification. When disagreement had been solved by discussion, these scorings were used in the analysis, otherwise the scorings of the main coders were used.

Following previous recommendations [41, 42], we had wished to calculate separate composite scores for the parental and child domains. However, only one subscale in the parental domain, named parental sensitivity, including sensitivity/responsivity, detachment reversed and positive regard, reached a sufficiently high Cronbach's Alpha (.88 at T1 and .74 at T2). The child domain, including child positive mood and child negative mood reversed, did not reach a sufficiently high Cronbach's Alpha (.53 at T1 and .39 at T2). In the following

analysis, we therefore included child positive mood and child negative mood as single variables, in addition to parental sensitivity composite score and quality of relationship. The latter is also used as a single variable.

This is My Baby (TIMB) is a 5- to 15-minute-long semi-structured interview, investigating the caregivers' emotional investment in the foster child [45]; it was administred both at T1 and T2. However, only T1 data were included in the present study because the T2 interviews were administred with the child present and therefore might be of less quality. The interview consists of nine questions, with the answers on eight of the questions constituting the basis for scoring acceptance, commitment and awareness of influence on a five-point Likert scale, including half points [45]. Previous research has reported correlations between these three concepts to range between r = .43 and r = .69 [7]. Correlations between these three concepts in our study were as follows: acceptance and commitment r = .67, acceptance and awareness of influence r = .62 and commitment and awareness of influence r = .53. In the present study, only commitment was included.

Commitment may be defined as to what degree the caregiver perceives the foster child as his/her own and allows him/herself to become emotionally attached to the child. High scores on commitment are given when the caregiver utters a strong desire to be a parent of the child and expresses that he/she will miss the child deeply if the child must move, meaning that the caregiver has *psychologically adopted* the child. In contrast, low scores are given when the caregiver is indifferent to whether the child will stay or not, and when the caregiver is consciously limiting the emotional bond to the child [45]. The most relevant questions are: *Do you wish to parent (child's name) forever*? and *How much would you miss (child's name) if he/she had to move?*

The 60 TIMB interviews were audio-recorded, transcribed and blindly double coded by two persons who were clinical psychology graduate students in their final years. These

coders were trained by the first author, who is a reliable coder and had received training in the lab of Mary Dozier. The coders also passed the reliability test used in the Dozier lab. Commitment was coded on a five-point Likert-scale, including half points, while intraclass correlation (single measures) was within acceptable norms; .90. In a further analysis, a calculated mean of the scores obtained from the two coders was used, resulting in a 17-point scale (from 1–5 with intervals of .25) [32].

Caregiver questionnaire related to their socio-economic status including age, income and education was completed at both T1 and T2.

Additionally, the *child protection services* completed a questionnaire concerning the foster children's early and present caregiving history including age at first and current placement, number of placements, number of visitations, and reasons for placement.

Statistics. Descriptive statistics, chi square, and independent sample t-tests were used to analyse the sample characteristics. Linear mixed effects (LME) models were used to analyse the changes in parental sensitivity composite scores between the age of 2 and 3 years, with fixed effects including the interaction between group and time, as well as an adjustment for gender and parental education; and a random intercept. Mixed effects models are a general procedure for analysis of repeated measurements, or data with other clustering structures, of scale scores [46]. An attractive feature of these models is that they do not assume balanced data, in particular they give valid results with missing values at one or more time point under the less restrictive missing at random assumption. The number of included participants in the LME model for the complete sample and the foster children only was 101 and 60, respectively, and the model fit was investigated by plots of the residuals by fitted values and by normal plots of the residuals [46]. We also estimated a linear mixed effect model within the foster group only, with time and foster parents' commitment at T1 as covariates, with adjustment for child sex, main caregiver education and child age at final foster placement.

Child positive and negative mood and quality of relationship were not strictly continuous variables and were not analysed by mixed effects models. Changes from 2 to 3 years in child positive and negative mood and quality of relationship were computed for each individual child, and the means of their individual changes were thereafter computed within both groups, together with the differences between these group means. Bootstrap BC_a confidence intervals were computed for group means, and their differences and p-values were estimated by inverting this procedure. Specifically, p-values for the inverted test were defined as 1 – the confidence degree of a confidence interval just containing 0. The number of bootstrap replications was increased to 1 000 000 for a reliable estimation of p-values by this procedure. Analyses used the R statistics program (The R Foundation for Statistical Computing, Vienna, Austria). The R packages nlme [46] and boot were used for the analysis of the mixed effects models and bootstrap analyses, respectively. SPSS version 18 (IBM SPSS, Armonk, New York, USA) was used for other analyses.

Results

Descriptive statistics on parental sensitivity, child positive and negative mood, and quality of relationship in the two groups are shown in Table 2. The mean score on foster parents' commitment was 4.4 (*SD* .6, range 3.0 – 5.0).

Insert Table 2 here

A graphical analysis confirmed that the LMEs had a satisfactory fit for the parental sensitivity composite score at both 2 and 3 years. The graphical analysis included a plot of standardized residuals by fitted values, and a normal probability plot of the standardized residuals. As shown in Table 3, an LME analysis, controlled for sex and main participant education, revealed a significant difference in the mean score on this composite variable between the foster parent and the caregivers in the non-foster group at T1 (p=.002), but not at T2 (p=.449). As shown in Table 4, bootstrap analysis revealed a significant group difference

in child positive and negative mood at T1 (p<.001), but not at T2 (p≥.372). Lastly, as to the quality of relationship, significant group differences were identified at both T1 (p<.001) and T2 (p=.012).

Insert Table 3 here

Concerning within-group differences over time, LME analysis revealed that the mean score in the foster group increased significantly from T1 to T2 (p<.001), which was not the case for the non-foster group (p=.449). Bootstrap analysis revealed a significant positive change from T1 to T2 in child positive and child negative mood (p<.001) for the foster group, but this was not the case for the non-foster group (p≥469).

Insert Table 4 here

As to interaction between group and time, a significant interaction was identified for parental sensitivity (p=.017) (see Table 3). Figure 1 shows that the foster group closes the gap, although not completely. Bootstrap analysis showed that on child positive (p=.002) and negative (p≤.001) mood, the difference in the change scores from T1 to T2 were significant, meaning that the difference between the two groups decreased significantly. Such a difference was also identified on the quality of the relationship variable (p=.002).

Insert Figure 1 here

Lastly, LME analysis within the foster group only revealed a significant association between parental sensitivity composite score and commitment (Coeff: 0.33, CI 0.02, 0.65, p=.040). In this model, there was also a significant positive change in the parental sensitivity composite score from T1 to T2 (Coeff: 0.34, CI .12 to .56, p=.003).

Discussion

The results showed that the two groups included in this study did not develop similarly as revealed by the sensitivity composite scales. We identified differences between the foster

group and the non-foster comparison group on all variables when the children were 2 years old. However, one year later, at the age of 3 years, no significant group differences were detected, except for quality of relationship, on which the foster group was still behind.

Our first hypothesis was partially supported. At T1, the foster parents' quality of interaction with their children (parental sensitivity, child positive and negative mood, and quality of relationship) was below that in the non-foster group. The foster parents were rated to be significantly less sensitive at the first time-point, but the difference was no longer significant one year later. Although there is a dearth of research on foster parents' sensitivity towards their foster children, our results at 2 years of age are supported by studies suggesting that foster parents have difficulties being sensitive early in placement, both in terms of nurturance and synchronicity [38, 47]. One possible reason may be that the foster children's cues are difficult to read due to early maltreatment and biological vulnerabilities. Consequently, foster families may need time to establish a trustful, reciprocal and sensitive quality of social interaction [10, 48].

Looking at child mood, the foster children significantly differed from the non-foster group at the first time-point, but not at the second. One may argue that the children need time to develop trust and to understand that the foster parents invite them to positive play experience during interaction. At the second time point they might have developed sufficient trust, and as shown by their emotional expressions being more positive. The decrease in group differences over time suggests a positive adaptational trend. Children do need time to adapt when placed in new families, and due to their previous care experiences they may easily assume that they will meet the same adverse quality of care in the new home. Another possibility is that most of the foster children in our study were placed in non-kinship foster care, meaning that the foster parents were totally unknown to them. Research has shown that foster children who are placed in kinship foster care meet less socio-emotional challenges

[49]. Although Holtan, Ronning, Handegard and Sourander [49]'s research did not include positive and negative mood, or mood in a parent-child interaction procedure [49], the study suggests that foster children placed in non-kinship care do have more challenges in regulating emotions [29], showing less positive and more negative mood towards their foster parents.

The scale "quality of relationship" yielded results that fully support our first hypothesis; the foster group was rated to be significantly below the non-foster group at both T1 and T2. "Quality of relationship" says something about the overall interaction between caregiver and child during the 15-minute play observation, including sensitivity and child mood. It should be noted that on average the scores at T1 and T2 were not below the midpoint of the rating scale. We therefore argue that our findings support previous research suggesting that foster families form positive relationships provided the foster parents are able to offer nurturing caregiving [24, 38].

The results lend partial support to our second hypothesis. The scores on all "positive" interaction variables (parental sensitivity, child positive mood and quality of relationship) increased when measured one year later, whereas child negative mood decreased significantly. Moreover, a significant group by time interaction effect was identified, meaning that on parental sensitivity the foster parents had caught up with the parents in the non-foster group, although not completely. Due to methodological restrictions, group by time interaction could not be investigated for the other variables (child positive mood, child negative mood and quality of relationship). However, a significant difference in change scores was identified for these variables, and over time the foster group became more like the non-foster group. In addition to the importance of length of time the children had spent in the foster home, the positive change in sensitivity may be due to the fact that the foster parents had learned to read the child's cues in a more accurate way, thereby responding in a more sensitive and nurturing way to the child's needs [8, 47]. Increasing the parents' ability to read the child's cues has

been assumed to be essential in establishing a healthy child-parent relationship [17]. Finally, it should be mentioned that a majority of the foster parents had participated in a training program [39] before placement, in addition to having received some kind of guidance after placement. Participating in a training program may have sensitized these foster parents to be able identify the needs of these vulnerable children.

One reason for the enhancement of positive emotional expression in the foster children may be the positive change that occurred in parental sensitivity. This change might have enabled the children to develop a trusting relationship to their foster parents, thus becoming more well-adjusted [24]. Our results suggest that the foster parents might have increased in their ability to better identify the children's signals accurately, and thereby be able to nurture the foster children when they were in need of soothing, as well as being better able to follow the children's lead in play [12, 13]. A sensitive relationship may help the child towards positive emotion regulation in interacting with the caregiver [20]. Such an understanding is in line with the transactional model of the parent-child relationship, meaning that the caregiver and the child influence each other reciprocally over time. A positive change in either the parent or the child leads to a positive change over time in both parts of the relationship [36]. Sameroff [36] argues that it is important to see the child-parent relationship as a unified whole. Such a relationship needs time to be established in foster care, as compared to what is expected in typical biological families.

Because the variable called quality of relationship is an overall global rating, a high score on this variable will necessarily mean high scores on the other variables too. Based on the literature of sensitivity, we assume that the foster parents' ability to provide nurturance and synchrony in child–parent social interaction when needed enhances child development and adaptation [13, 14]. The quality of care in the foster families may have had a therapeutic effect, causing these vulnerable children to heal [24, 38]. The children in the present study

were placed in foster care quite early in life, on average before 9 months of age. The appearance and behavior of infants and young children is supposed to evoke sensitive and caregiving behavior at another level than is the case for older children [38].

Since the foster group improved on all interaction variables over time, these dyads most certainly had a more troubled interaction pattern at the first measure point when the children were approximately 2 years old, when the social interaction was marked by less caregiver sensitivity and more child negative mood in the foster group as compared to the age of 3 years. With a reduced quality of social interaction, the two parts in the dyad could easily influence each other in a negative way, reinforcing the effects on each other over time. When a child with less positive interaction abilities starts a negative "dance" with its caregiver, the interaction may lead to a less optimal developmental pathway or a negative circuit [20]. Such a "dance" seems over time to have changed to a more positive pattern in the present study.

Our third hypothesis that foster parents with higher commitment would exhibit higher sensitivity was also supported. We did identify a significant association between commitment and parental sensitivity, meaning that higher commitment was associated with higher parental sensitivity. To our knowledge such an association has not previously been identified. Previous research has shown that foster parents with higher degree of commitment show more delight in the relationship with their foster children [33]. One might argue that positive regard, which was included in the sensitivity composite score in our paper, is synonymous to delight. Although commitment has been more linked to wanting the foster child to be part of the family over time, it might also be that such an investment will influence the foster parents' sensitivity towards the child. Further investigation is needed to help gain more knowledge about the importance of commitment in foster parent–foster child relationships.

Limitations

Although this study has several strengths, such as a longitudinal design, use of observational methods and a non-foster comparison group, it also has several limitations. First, lack of satisfactory interrater reliability on several variables that we had planned to include excluded some analyses that presuppose continuous variables. In such analyses, we could only use the parental sensitivity composite score. Also, we were not able to include a composite score from the child domain because the two relevant variables did not yield an acceptable Cronbach's Alpha. Secondly, there were different coders at T1 and T2, which unwittingly may have contributed to coder drift both in the direction of a more positive as well as a more negative perception of the foster group. Nevertheless, if the raters at T2 were more positive in their ratings, one would expect a more positive perception of both groups since all coders were blind to group identification. Thirdly, the sample size was too small for subgroup analyses; therefore, we were not able to investigate if a sub-group within the foster sample was at especially high risk. In previously published studies we have checked whether age at foster placement, number of placements and reasons for placements influenced the foster children's development, which was not the case [40]. Fourthly, at T2 six families dropped out of the study; four foster families and two families in the non-foster group. However, six out of 102 families is a small amount; hence, the probability that this dropout rate should have had an influence is small. Finally, we do not know if the sample is a representative one. Despite these limitations, this study adds new information to the limited knowledge of how foster parent–foster child relationships develop over time.

Clinical implications

Working with foster families and their foster children is a challenge due to the care history of the children. Foster children are a vulnerable group; in addition to receiving new caregivers, most of these children have experienced maltreatment prior to placement. Very limited

research has been conducted on young foster children and their foster parents' social interaction. This study contributes to the research and clinical field, showing that there are possibilities for overcoming challenges in foster families. The results might give hope to those who work professionally with such families, and to the foster families themselves. It is possible for foster children to develop positive relationships to new caregivers, and for caregivers to become sensitive and experience joy in the new relationships. Although the aim of our study was not to investigate whether supervision influenced the foster dyads social interaction, most of the foster parents had received supervision in some form, and the children were placed early in their care. We therefore recommend that all foster families from early in placement on receive supervision of high quality to promote healthy development and adaptation in their children.

Summary

Most foster children have experienced a negative caregiving environment before moving into foster care. Foster parents will therefore struggle with understanding the signals of these children and are at risk of not being able to be sensitive and provide nurturance and synchronous parent–child interaction. The primary aim of this study was to investigate the quality of interaction between foster parents and their early placed foster children when the children were 2 and 3 years old, as compared to a group of typical families. A second aim was to investigate the possible association between child development and adaptation, and the foster parents' commitment. We hypothesized that there would be significant group differences on all scales (parental sensitivity, child positive and child negative mood and quality of relationship) at both age levels. Thirdly, we hypothesized that highly committed foster parents would be more sensitive than the less committed ones. Video observations were used to investigate child–parent interaction, and an interview was administered to investigate

commitment in the foster parents. The result showed that the participants in the foster group changed positively over time and partly caught up with the families in the non-foster group. Only one group difference was detected at age 3 years: quality of relationship. Over time, a positive developmental trend in the foster group was detected, and a significant group by time interaction on parental sensitivity was identified. Our third hypothesis was also supported; we identified a positive relation between commitment and parental sensitivity in the foster group. The positive trend in the foster group on all parent–child interactions scales included in this study, contributes to an optimistic view of the possibilities of foster care. As the foster parents, especially on the sensitivity scale, closed the gap to the non-foster parents it is difficult to assume that a further increase in the quality of social interaction with their foster children would take place. However, that would have been an important follow-up hypothesis in future studies of foster care.

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Ethical approval: Informed consent was obtained from all individual participants (caregivers and child protection services) included in the study.

[I] This study was approved by the National Committees for Research Ethics and Norwegian Centre for Research Data.

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Table 1: Foster children's placement history (*n*=60)

	Min	*Max*	*Mean*	*SD*
Age at first placement (months)	.03	18.6	4.6	5.2
Age at final[ii] placement (months)	.07	21.7	8.2	5.8
Number of placements	1	4[i]	1.8	.07
Time in final foster home[ii] (months)	2	23	15.1	5.8

[i] There might have been more than four, as the registration from the Child Protection Services is not always reliable.

[ii] Final foster home is the home where the foster children lived when they were part of the present study.

Table 2: Quality of Parent–child interaction at 2 (T1) and 3 (T2) years of age – descriptive statistics

Three boxes procedure	**Foster group (n=60)**				**Non-foster group (n=42)**			
T1	**Mean**	**SD**	**Min**	**Max**	**Mean**	**SD**	**Min**	**Max**
Parental sensitivity comp.	3.5	.9	1.0	4.7	4.1	.6	2.7	5.0
Child positive mood	2.5	.6	1.0	4.0	3.2	.8	2.0	4.7
Child negative mood	2.3	.9	1.0	4.0	1.7	.7	1.0	4.0
Quality of relationship	3.2	1.0	1.0	5.0	4.0	.8	2.0	5.0
	Foster group (n=55)				**Non-foster group (n=40)**			
T2	**Mean**	**SD**	**Min**	**Max**	**Mean**	**SD**	**Min**	**Max**
Parental sensitivity comp.	3.8	.6	2.0	5.0	4.1	.5	2.7	5.0
Child positive mood	3.2	.8	2.0	5.0	3.4	.8	2.0	5.0
Child negative mood	1.6	.8	1.0	4.0	1.6	.7	1.0	3.0
Quality of relationship	3.6	.7	2.0	5.0	3.9	.5	3.0	5.0

Table 3: Parental sensitivity within and between group at T1 and T2

Parental sensitivity	**Coef.**	**(95% CI)**	***t* (df)**	***p*-value**
Group by time			2.43 (93)	.017
Group (24 month)[a]	.47	(.18, .76)	3.21 (96)	.002
Group (36 month)[b]	.11	(-.18, .41)	0.76 (96)	.449
Time (foster)[c]	.34	(.15, .53)	3.60 (93)	<.001
Time (comp)[d]	-.02	(-.24, .21)	-0.13 (93)	.893

[a] Non-foster minus foster group at 24 months

[b] Non-foster minus foster group at 36 months

[c] Time 36 month minus 24 month, foster group

[d] Time 36 month minus 24 month, comparison group

[i] Controlled for child sex and main participant education

Table 4: Differences in child affect and quality of interaction from T1 to T2

	Coef.	**(95% CI)**	***p*-value**
Child positive mood			
Group difference T1[a]	.72	(.43, .99)	<.001
Group difference T2[b]	.15	(-.18, .47)	.372
Change (foster)[c]	.76	(.47, 1.04)	<.001
Change (non-foster)[d]	.16	(.13, .42)	.251
Change difference[e]	.60	(.21, .10)	.002
Child negative mood			
Group difference T1[a]	-.59	(-.90, -.25)	<.001
Group difference T2[b]	0	(-.30, -.30)	>.999
Change (foster)[c]	-.72	(-1.24, -.22)	<.001
Change (non-foster)[d]	-.05	(-.26, .16)	.600
Change difference[e]	-.67	(-1.04, -.31)	<.001
Quality of relationship			
Group difference T1[a]	.79	(.45, 1.12)	<.001
Group difference T2[b]	.31	(-.67, .55)	.012
Change (foster)[c]	.45	(.21, .71)	<.001
Change (non-foster)[d]	-.08	(-.31, .16)	.469
Change difference[e]	.53	(.19, .88)	.002

[a] Non-foster minus foster group at 24 months

[b] Non-foster minus foster group at 24 months

[c] Change from 24 to 36 months, foster group

[d] Change from 24 to 36 months, comparison group

[e] Difference in changes between foster- and non-foster group