



Universiteit
Leiden
The Netherlands

Development after international adoption

Dries, L. van den

Citation

Dries, L. van den. (2010, October 27). *Development after international adoption*. Retrieved from <https://hdl.handle.net/1887/16079>

Version: Not Applicable (or Unknown)

License: [Licence agreement concerning inclusion of doctoral thesis in the Institutional Repository of the University of Leiden](#)

Downloaded from: <https://hdl.handle.net/1887/16079>

Note: To cite this publication please use the final published version (if applicable).

4. Infants' Attachment Security after International Adoption from Foster Care or Institutions in China

*L. van den Dries, F. Juffer, M. H. van IJzendoorn,
M. J. Bakermans-Kranenburg, & L. R. A. Alink
Manuscript submitted for publication*

ABSTRACT

Objective: To compare attachment security, indiscriminate friendliness and responsiveness of infants adopted from institutional care (PI) and foster care (FC) in China, and compare their development with non-adopted children. *Method:* Fifty PI and 42 FC children, aged 11-16 months on arrival, were studied 2 and 6 months post-adoption. Attachment was assessed with the Strange Situation Procedure. Mothers reported on indiscriminate friendliness, and child responsiveness to the mother was observed during free play. *Results:* FC children were as securely attached as non-adopted children, whereas PI children showed more insecure attachment. Both groups showed more disorganized attachment than non-adopted children. FC and PI children did not differ on responsiveness and indiscriminate friendliness, but FC children increased more in responsiveness than PI children. Children with higher cognitive scores and children with more sensitive adoptive mothers showed less indiscriminate friendliness. *Conclusion:* Pre-adoption foster care is less detrimental to children's attachment security than institutional care.

INTRODUCTION

Adopted children are at risk of developing insecure and disorganized attachment relationships with their adoptive parents, particularly when they are adopted after their first birthday.¹ Here we address the question whether infants adopted from institutions versus foster families differ in their way of adapting to their new family, how their adaptation develops across time, and what role the adoptive parents play. We examined the social-emotional development of infants adopted from China to the Netherlands around their first birthday. We observed the children two and six months after adoption and compared their development with that of normative, non-adopted children.

Foster care versus institutional care

In China, the number of foster families is increasing, as foster care is perceived as less detrimental than institutional care.² However, hardly any study has contrasted the development of former foster (FC) and post-institutionalized (PI)

children after their adoption.³ For example, not much is known about potential differences regarding their attachment formation with the adoptive parents, although one study found no differences in parent-reported attachment behavior between FC and PI children.⁴ Whether the *observed* attachment behavior of FC and PI children differs from that of non-adopted children and whether there are changes in attachment security in the first months after adoption is, to our knowledge, examined for the first time in the current study.

Attachment security

Forming an attachment relationship is a salient developmental milestone. For example, secure attachment is associated with a more positive social development,⁵ whereas insecure and disorganized attachment is related to later externalizing behavior⁶. A central assumption in attachment theory is that daily interactions with caregivers in the first years of life contribute to the development of *internal working models* of attachment.⁷ These models contain mental representations of the attachment figure and the self, and are used to interpret and anticipate the behavior of the attachment figure and thereby influence the child's own attachment behavior. Especially during early childhood internal working models are flexible, and can change as a consequence of changing environments.⁸ Thus, the transition from an adverse pre-adoption rearing setting to a more sensitive adoptive family may (eventually) result in a corresponding change in adopted children's internal working model. In the current study we included children adopted around their first birthday, a period considered formative for the development of a first attachment relationship. The effect of the pre-adoption rearing setting (foster family versus institution) on children's attachment relationship with the adoptive parents is one of the central questions of our study.

The transition to a more sensitive adoptive family may also contribute to an increase in children's responsiveness to their new parents. A more passive and less responsive interaction style is characteristic of post-institutionalized children, possibly due to the lack of sensitive care before the adoption.⁹ In the current study we tested whether children's responsiveness shortly after adoption and possible changes in responsiveness during the first half year in the adoptive family depended on pre-adoption care (foster versus institutional care).

Indiscriminate friendliness

Indiscriminately friendly children react in too intimate ways towards unknown strangers (e.g., climbing on their lap), without showing "normal" fear or reticence¹⁰. Indiscriminate friendliness (IF) has been hypothesized to result from the lack of consistent and responsive caregiving. IF may then be adaptive, as it may maximize the probability of being cared for.¹¹ Several studies have found that institutionalized children and post-institutionalized adopted children show IF.⁹ IF has been found to persist in the first years after adoption.^{4,11} Since FC children probably received more consistent, family-type care in their early lives than PI children, lower levels of IF may be expected in FC children.

Hypotheses

We examine the following hypotheses: (1) PI children show higher rates of insecure, in particular insecure disorganized attachment, compared to non-adopted children. FC children, who may have experienced pre-adoption care of higher quality, present a more normative distribution of organized and disorganized attachment; (2) Reversibility of insecure and disorganized attachment is expected to be associated with parental sensitivity, with higher sensitivity related to changes to secure and organized attachments; (3) Adopted children show more IF than non-adopted children, and PI children are expected to exhibit more IF than FC children; (4) PI children are expected to display less responsiveness than FC children, and both groups of children are expected to show an increase in responsiveness over time.

METHOD

Participants and procedure

Adoptive families, adopting a girl aged between 11 and 16 months on arrival, were recruited through all three Dutch adoption agencies arranging adoptions from China. As the majority of children adopted from China are female (89% when the data collection started¹²), we included only girls in our study. In total, 198 families were contacted, of which 152 families responded (77%). Of these 152 families, 100 families agreed to participate (66%), 52 families did not want to participate (most families mentioned that the laboratory was too far away or they found participating too time-consuming/exhaustive for their child). Eight families dropped out for various personal reasons.

The 92 families that participated were visited at home and visited the university, two months (Time 1) and six months (Time 2) after the children's arrival in the Netherlands. At arrival the children's mean age was 13.03 months ($SD = 1.35$). At the first home and lab visit the children had been in their adoptive family for an average of 2.21 months ($SD = 0.19$) and 2.64 months ($SD = 0.30$), respectively. The second visits were on average 6.30 ($SD = 0.26$) and 6.82 months ($SD = 0.48$) after arrival, respectively. All visits were conducted with the primary caregiver (90 mothers, 2 fathers), hereafter: mothers. In addition, the parents received questionnaires on their child's pre-adoption experiences (e.g., months in institutional and/or foster care) and their child's behavior (e.g., indiscriminate friendliness).

Based on pre-adoption care, children were classified as either post-institutionalized (PI) or former foster children (FC). PI children had lived in an institution prior to their adoption and had experienced other types of care for a maximum of one month ($n = 50$). Children who had only experienced foster care (or another type of family care) or experienced a combination of both foster care and institutional care were classified as former 'foster children' ($n = 42$). Sixteen of them had not experienced institutional care at any time. Children with a foster care background had on average experienced 3.65 months of institutional care and 9.31 months of foster care before their adoption.

Ninety children were adopted into two-parent families, while two children were adopted by single mothers. The mothers' age averaged 36.60 years ($SD = 2.82$) and fathers' 37.50 years ($SD = 2.67$). Most parents had a high education on a scale ranging from 1 [primary school only] to 5 [university] (mothers: $M = 3.79$, $SD = 0.92$; fathers: $M = 4.09$, $SD = 0.89$). For IF, the adopted children at Time 2 were compared to 129 non-adopted, first-born Dutch girls (Mean age = 17.98 months, $SD = 0.80$).¹³ At Time 1 the age difference between the adopted and non-adopted children was too large to compare the groups. The attachment distribution of the adopted children was compared to normative distribution¹⁴ and the meta-analytic distribution of attachment in adopted children.¹

Measures

Strange Situation Procedure. The Strange Situation Procedure (SSP¹⁵) is an observational laboratory procedure consisting of eight 3-minute episodes with two separations from and reunions with the parent. Attachment in the SSP is classified as secure, insecure-avoidant, insecure-ambivalent and insecure disorganized based on the patterns of (in-)secure attachment behavior and the presence of disorganized attachment behavior.^{15,16} Secure (B) children usually have sensitive caregivers whom they use as a 'secure base' when exploring the environment and as a safe haven when they are distressed. Insecure-avoidant (A) children have experienced rejection or uninvolved care, leading to a minimization of their expressions of negative affect, in order to avoid the anticipated rejection of distress signals. Insecure-ambivalent (C) children usually have inconsistently responsive caregivers and maximize negative emotions to evoke care. Secure, ambivalent and avoidant children show *organized* strategies of emotion regulation. *Disorganized* attachment behavior is shown by children who are confronted with an insolvable paradox in stressful circumstances: their caregiver is at the same time a source of fear and the only potential source of comfort.¹⁷ In the SSP disorganized (D) children show disorganized behavior toward the parent, suggesting a (temporary) breakdown of a consistent attachment strategy while dealing with the stress of the reunion; these children for example show contradictory or misdirected attachment behaviors, or fear or apprehension regarding the parent.¹⁶ Children classified as 'D' received a secondary A/B/C-classification.

The videotaped SSPs were coded by two well-trained coders (MHvIJ en LRAA) who were blind to the assessment time as well as the children's pre-adoption care setting. First and second assessments of the same child were never coded by the same coder. Interrater reliability (kappa) among the coders on 15 tapes was .63 for the ABC-classifications and .52 for the ABCD-classifications. The percentages of agreement were 80% and 67%, respectively. For the continuous security and disorganization ratings the intraclass intercoder reliabilities were .69 and .63, respectively. The security scores were computed using the simplified Richters, Waters, and Vaughn¹⁸ algorithm for attachment security¹⁹ on the basis of the interactive SSP scores for proximity-seeking, contact maintenance, resistance, and avoidance. Due to technical problems one of the SSP recordings of the second assessment could not be coded.

Indiscriminate friendliness. IF was measured using five multiple-choice questions, each with one of the four answers reflecting IF.¹⁰ At both times mothers reported: 1) how friendly their daughter was to new adults; 2) whether she was shy; 3) what she did upon meeting new adults; 4) whether she was willing to go home with a stranger, and 5) whether she had a tendency to wander off without being distressed. Not all mothers had yet observed their child in every situation. For example, at Time 1, 17 mothers were unable to answer question 4 (see above). As earlier research used two subscales for IF (items 1-3 versus items 4 and 5¹³), we decided to use only the first three items, that were more applicable for our children. Total scores were computed for children for whom at least two questions were answered. Cronbach's Alpha was .77 ($n = 129$) for the non-adopted children and .65 ($n = 82$) and .65 ($n = 87$) for Time 1 and Time 2 of the adopted children, respectively. Total IF-scores were transformed to normalize the skewed distribution ($1 - 1/[\text{original value} + 1]^{20}$).

Emotional Availability Scales. Children's responsiveness and maternal sensitivity were observed at home during 8 minutes of free play and coded with the Emotional Availability Scales (EAS²¹). Responsiveness (7-point rating scale) reflects children's eagerness and willingness to respond to the mother, taking the affective quality of the response into account. Sensitivity (9-point rating scale) refers to the mother's ability to correctly read and respond to the child's signals, and includes affect shown towards the child.²¹ Both mother and child scales, and both assessments of all dyads were assessed by different coders, resulting in four coders per dyad. The intraclass intercoder reliabilities with the expert coder were .77 and .79 for responsiveness and .76 and .89 for sensitivity. Sensitivity and responsiveness were compared with the cutoff scores representing at risk development²²: Sensitivity: risk 1-5, non-risk 5.5-6.5, optimal 7-9; Responsiveness: risk 1-3, non-risk 3.5-4.5, optimal 5-7. As sensitivity and responsiveness were measured in the same situation, they were not used in the same analyses.

Missing data and data-analysis

Apart from one missing attachment classification (see above), the attachment of two children could only be classified with the 3-way classification system: one child refused to let her mother leave the room (Time 1 and 2), while in another session a mistake was made (Time 2), preventing proper coding of disorganized attachment. For IF and for the continuous attachment scores missing values were substituted with mean scale scores (range = 0-3 missings). Results were similar when children with missing values were excluded from the analyses.

We first present the categorical attachment classifications, and compare the classifications of the adopted children with the normative distribution¹⁴ and with the meta-analytic distribution of attachment in adopted children,¹ using Multinom.²³ To examine the development of the continuous attachment scores over time and to compare the FC and PI children, we present repeated measures ANOVAs. We conclude with repeated measures ANOVAs for child responsiveness, IF, and maternal sensitivity. Because FC children outperformed

the PI children on cognitive and motor development (Van den Dries, Juffer, Van IJzendoorn, & Bakermans-Kranenburg, 2010), we included these variables as covariates in the repeated measures ANOVAs. When their contribution was not significant, the covariates were removed from the final analyses. Correlations were computed between child outcomes and for the continuity between Time 1 and Time 2. Two-tailed tests were used in all analyses.

RESULTS

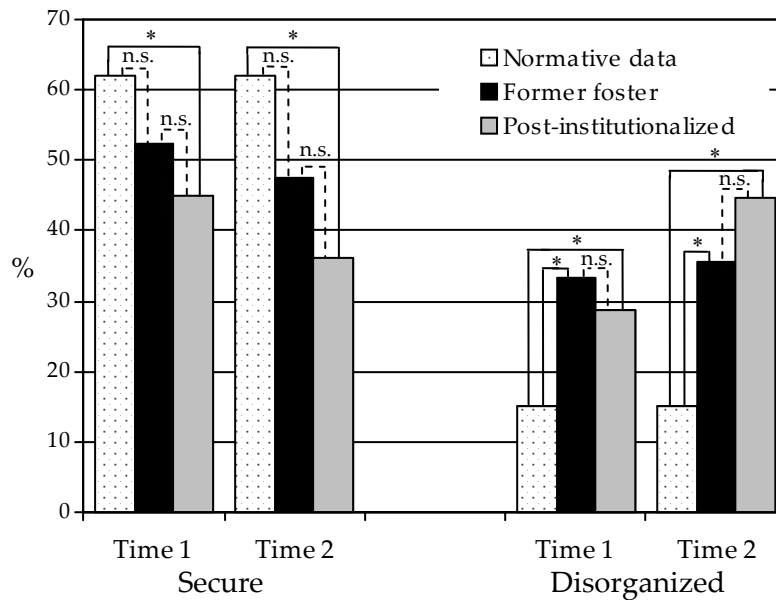
Preliminary analyses

Preliminary analyses did not show any differences between PI and FC children on relevant child variables (e.g., age at adoption, physical growth, place in the child row), nor on parent variables (e.g., parents' age and education).

Categorical attachment classifications

Two months after arrival, 10% of the children were classified as avoidant, 48% as secure, 11% as ambivalent, and 31% as disorganized. Six months after arrival the distribution was: 7% avoidant, 42% secure, 11% ambivalent, and 40% disorganized (see Table 1 for separate distributions of the FC and PI children). There were no significant differences between the distributions of the PI and FC children ($\chi^2[3, n = 91] = 6.01$ and $\chi^2[3, n = 89] = 3.24$, $ps > .05$, at Time 1 and Time 2, respectively).

Compared to the normative distribution of attachment (15% A, 62% B, 9% C, and 15% D¹⁴), the PI children showed significantly less secure and more disorganized attachments at both assessments (χ^2 -values ranging from 6.08 to 32.47, $ps < .05$, with $N = 91$ and $N = 89$ for Time 1 and Time 2, respectively; see Figure 1). The FC children were as often securely attached as the non-adopted children ($\chi^2[1, N = 91] = 1.65$ and $\chi^2[1, N = 89] = 3.69$, $ps > .05$, at Time 1 and Time 2 respectively; see Figure 1), but showed more disorganized attachments ($\chi^2[1, N = 91] = 11.07$ and $\chi^2[1, N = 89] = 14.13$, $ps < .05$ for Time 1 and 2, respectively; see Figure 1). Compared to the meta-analytic attachment distribution of adopted children (47% B and 31% D¹), similar percentages of secure and disorganized attachment were found for both the PI and FC children ($0.09 < \chi^2[1, N = 91] < 0.49$ and $0.01 < \chi^2[1, N = 89] < 4.11$, $ps > .05$, for Time 1 and 2, respectively). The four-way ABCD-classifications of the children were not stable in the four months between Time 1 and Time 2 (kappas .01, .04, and -.03, $ps > .05$, for the entire sample, FC, and PI children, respectively). The three-way ABC-classifications were more stable over time (kappa = .24, $p < .01$), suggesting instability of disorganized attachment in particular. Of the 24 children who showed an *organized* attachment relationship at Time 1 and a *disorganized* attachment relationship at Time 2, 18 children had stable three-way classifications. Of the 16 children who developed an *organized* attachment relationship with their adoptive mother, 11 children had stable three-way attachment classifications. Twelve children remained disorganized over the four-month period.



* $p < .05$; n.s.: not significant

Figure 1. Percentages of secure and disorganized attachment classification for former foster children, post-institutionalized children, and normative data from Van IJzendoorn et al. (1999).

Continuous attachment scores

Using repeated measures ANOVAs, we found no differences between PI and FC children on the continuous security and disorganization scores. We did not find changes in security or disorganization scores over time, nor an interaction between time and pre-adoption care (Table 2). Attachment security scores were significantly correlated over time ($r = .28, p < .01$), whereas this was not true for disorganization ($r = .17, p > .05$). Neither security nor disorganization was significantly correlated with the other variables ($-.18 > r > .18, p > .05$).

Indiscriminately friendliness

Children of more sensitive adoptive mothers showed less IF than children of less sensitive mothers ($r = -.20, p = .053$ and $r = -.25, p < .05$; for Time 1 and Time 2, respectively). No relation was found between IF and the other variables ($-.14 > r > .18, p > .05$). IF was significantly correlated over time ($r = .30, p < .01$). PI children did not show more IF than FC children, nor did we find a change in IF over time (Table 3). The FC and PI children did not differ from the non-adopted children on IF (adopted children: means ranging from .18 to .23; non-adopted children: $M = .27, SD = .31; F[2, 218] = 1.23, p > .05$).

Maternal sensitivity and child cognitive development at Time 1 were significant covariates in the repeated measures ANOVA ($F[1,88] = 6.35, p < .05$, partial $\eta^2 = .07$;

Table 1. Attachment classifications of post-institutionalized (PI) and former foster (FC) children at Time 1 and Time 2.

	Time 1				Time 2			
	PI		FC		PI		FC	
	3-way (<i>n</i> = 49) <i>N</i> (%)	4-way (<i>n</i> = 49) <i>N</i> (%)	3-way (<i>n</i> = 41 ¹) <i>N</i> (%)	4-way (<i>n</i> = 42) <i>N</i> (%)	3-way (<i>n</i> = 49) <i>N</i> (%)	4-way (<i>n</i> = 47) <i>N</i> (%)	3-way (<i>n</i> = 41 ¹) <i>N</i> (%)	4-way (<i>n</i> = 42) <i>N</i> (%)
A (avoidant)	4 (8.2)	4 (8.2)	6 (14.6)	5 (11.9)	4 (8.2)	2 (4.3)	8 (19.5)	4 (9.5)
B (secure)	31 (63.3)	22 (44.9)	31 (75.6)	22 (52.4)	31 (63.3)	17 (36.2)	29 (70.7)	20 (47.6)
C (ambivalent)	14 (28.6)	9 (18.4)	4 (9.8)	1 (2.4)	14 (28.6)	7 (14.9)	4 (9.8)	3 (7.1)
D (disorganized)		14 (28.6)		14 (33.3)		21 (44.7)		15 (35.7)

Note. ¹ Not included: Cannot Classify in 3-way classifications: Time 1: PI, *n* = 1; FC, *n* = 1; Time 2: FC, *n* = 1.

Table 2. Repeated Measures ANOVAs for Continuous Attachment Scores, Indiscriminately Friendly Behavior and Responsiveness of Post-Institutionalized (PI) (*n* = 50) and Former Foster (FC) Children (*n* = 42).

	Time 1				Time 2				Repeated Measures		
	PI		FC		PI		FC		Time	Group	Time x Group
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	F-value	F-value	F-value
Attachment Security	1.46 (2.33)	1.59 (2.70)	1.02 (2.48)	0.88 (2.47)	3.38	0.00	0.17				
Attachment Disorganization	3.19 (2.03)	3.64 (2.29)	3.79 (2.15)	3.96 (2.29)	2.45	0.80	0.23				
Indiscriminate Friendliness	0.21 (0.30)	0.18 (0.26)	0.19 (0.28)	0.23 (0.29)	0.18	0.00	1.33				
Responsiveness to Mother	4.86 (0.99)	4.67 (0.70)	5.07 (0.90)	5.32 (0.76)	17.05**	0.06	4.30*				

Note. * $p < .05$, ** $p < .01$

$F[1,88] = 7.17, p < .01$, partial $\eta^2 = .08$, respectively), revealing less IF for children of more sensitive mothers compared to children of less sensitive mothers, and less IF for children with higher cognitive scores compared to children with lower cognitive scores.

Child responsiveness

Using a repeated measures ANOVA (Table 2), we found an increase in child responsiveness over time (partial $\eta^2 = .16$). A significant interaction between time and pre-adoption care showed that FC children presented a larger increase in responsiveness than PI children (partial $\eta^2 = .05$). The adopted children's mean responsiveness scores (ranging from 4.76 to 5.32, Table 2) were well above the cut-off scores for at risk development (1-3), at both times. Responsiveness was not related to other child variables ($-.14 > r > .14, ps > .05$), while Time 1 and Time 2 responsiveness were significantly correlated ($r = .30, p < .01$).

Maternal sensitivity

A repeated measures ANOVA for sensitivity showed that mothers of FC and PI children were equally sensitive ($F[1,90] = .03, p > .05$; Time 1: PI: $M = 5.64, SD = 1.52$, FC: $M = 5.89, SD = 1.44$; Time 2: PI: $M = 5.86, SD = 1.55$, FC: $M = 5.70, SD = 1.50$) and that their sensitivity scores did not change over time ($F[1,90] = 0.01, p > .05$). Time 1 and Time 2 sensitivity scores were correlated, $r = .43 (p < .01)$. Maternal sensitivity scores (means ranging from 5.64 to 5.89) were within the non-risk zone (5.5-6.5). Sensitivity at Time 1 was not significantly related to the continuous attachment security scores (correlations .14 and .13, $ps > .05$, for Time 1 and 2, respectively) or disorganization scores (correlations .03 and .01, $ps > .05$, for Time 1 and 2, respectively), nor was sensitivity at Time 1 a significant predictor for changes in attachment security or disorganization ($F[1,90] = 0.01, p > .05$ and $F[1,90] = 0.03, p > .05$, respectively), or a significant covariate in the repeated measures analyses (except for IF).

DISCUSSION

We examined the social-emotional development of internationally adopted infants from institutional (PI) or foster care (FC) in China. FC children were as often securely attached as non-adopted children, whereas PI children showed significantly more insecure attachments. Both groups of children showed more disorganized attachments than non-adopted children. The FC and PI children did not differ on responsiveness and indiscriminate friendliness (IF) and their scores were comparable with those of normative, non-adopted children. However, we found a larger increase in responsiveness over time for the FC children compared to the PI children. Maternal sensitivity scores were in the non-risk range, while children of more sensitive adoptive mothers showed less IF compared to children of less sensitive mothers. Children with higher cognitive scores also showed less IF.

This study has several limitations. Details on pre-adoption care could not be established reliably, and parental attachment has not been included. In addition, attachment to the fathers and paternal sensitivity were not measured as more visits were not feasible. IF was measured by a questionnaire, which may be less valid than observations.

For the PI children the deviation from the normative attachment distribution was probably due to unresponsive pre-adoption care.²⁴ Although the PI children received relatively good physical care in China, as indicated by their only minor growth delays, the absence of responsive care was supported by their large cognitive delays (Van den Dries, Juffer, Van IJzendoorn, & Bakermans-Kranenburg, 2010). The normative percentage of secure attachments of the FC children may be the result of better pre-adoption care, which is consistent with the smaller cognitive and motor delays of the FC children compared to the PI children (Van den Dries, Juffer, Van IJzendoorn, & Bakermans-Kranenburg, 2010). However, for the FC children the adoption was also inextricably associated with the loss of their foster parent(s), which may have had an adverse effect on the development of new attachment relationships, possibly resulting in disorganized attachments.

The adopted children's attachment classifications were not stable over time, suggesting a rearrangement of their attachment system as an adaptation to life in the adoptive family. This instability is congruent with a study that showed a mixture of various attachment behaviors in foster children in the first months after placement.²⁵ Many children in our study developed secure and organized attachment relationships, but a substantial number of children developed disorganized relationships. For most of these children their ABC-classifications were stable. This is consistent with the stability of the security scores over time, and suggests a partial rearrangement of the attachment system, specifically regarding (dis)organization of attachment. For adopted children, disorganization may have a different meaning and may reflect "a *lack* of a coherent strategy for obtaining felt security from a new parent (rather than a *lapse* in strategy)",²⁵ implying reorganization is necessary to develop coherent attachment strategies. One study has shown that institutionalized children classified as disorganized had the highest security scores two years after adoption,²⁶ which may suggest that especially these children are open to changes in attachment.

In our study, maternal sensitivity was not associated with attachment. However, it should be noted that although the relation between sensitivity and attachment is empirically well established, the strength of this association is modest.²⁷ The short time our children have spent in the care of their generally sensitive adoptive mothers may not have been sufficient to affect attachment security. Moreover, Stovall and Dozier²⁵ indicated that sensitively responding to adopted/foster children's needs is not enough to influence attachment security. Parents have to act "therapeutically", for example by challenging children's alienating behaviors. Finally, as especially sensitive responses to infant *distress* are assumed to influence attachment,²⁸ the use of a free-play situation to measure sensitivity may not have been ideal.

The comparable levels of IF in PI, FC, and non-adopted children were unexpected, as higher levels were hypothesized for PI children. Rather than or in addition to the adaptive value of IF to increase the chance of being cared for, it has also been suggested that children develop IF when they lack contingent interactions with stable caregivers, which are necessary for developing preferences for familiar individuals.²⁹ Our PI children may have received just enough care in China to develop such preferences. This is in line with the improvements in care in Chinese institutions^{2,30}, especially in institutions benefiting from international adoption fees². Further, the fact that the children formed an attachment relationship with the adoptive parents soon after the adoption may suggest that there were some basic social contacts available to the children in China, although this could not be verified. The higher cognitive scores of children with lower levels of IF may suggest that these children were indeed able to profit from basic (social) stimulation in China. The lower levels of IF for children receiving more sensitive care compared to children of less sensitive adoptive mothers suggest some flexibility in IF in the first months after adoption, and an influence of parenting on its development.

For child responsiveness we found larger increases for FC than for PI children. The FC children may have felt at ease in the adoptive family more rapidly, due to their familiarity with family-rearing, and may therefore have benefited more from this environment. For PI children it may take longer before they respond to their new parents in affectively attuned ways.

CONCLUSION

Based on our findings we conclude that pre-adoption foster care appears to be more beneficial for the development of children's attachment relationships and for increasing rates of child responsiveness after adoptive placement, compared to pre-adoption institutional care. Nevertheless, for children adopted from both types of pre-adoption care early interventions are necessary to diminish the rate of disorganized attachment.

REFERENCES

1. Van den Dries, L, Juffer, F, Van IJzendoorn, MH, et al. Fostering security? A meta-analysis of attachment in adopted children. *Child Youth Serv Rev.* 2009;31:410-421.
2. Johnson, K. *Wanting a Daughter, Needing a Son: Abandonment, Adoption and Orphanage Care in China.* St Paul, MS: Yeong and Yeong Book Company; 2004.
3. Miller, LC, Chan, W, Comfort, K, et al. Health of children adopted from Guatemala: Comparison of orphanage and foster care. *Pediatrics.* 2005;115:710-717.
4. Bruce, J, Tarullo, AR, Gunnar, MR. Disinhibited social behavior among internationally adopted children. *Dev Psychopathol.* 2009;21:157-171.
5. Schneider, BH, Atkinson, L, Tardif, C. Child-parent attachment and children's peer relations: A quantitative review. *Dev Psychology.* 2001;37:86-100.
6. Fearon, RP, Bakermans-Kranenburg, MJ, Van IJzendoorn, MH, et al. The significance of attachment security and disorganization in the development of children's externalizing and aggressive behavior: A meta-analytic study. *Child Dev.* in press.
7. Bowlby, J. *Attachment and Loss (Vol. 1). Attachment.* New York: Basic Books; 1969.
8. Bowlby, J. *A secure base: Clinical applications of attachment theory.* London: Routledge; 1988.
9. MacLean, K. The impact of institutionalization on child development. *Dev Psychopathol.* 2003;15:853-884.
10. Chisholm, K, Carter, MC, Ames, EW, et al. Attachment security and indiscriminately friendly behavior in children adopted from Romanian orphanages. *Dev Psychopathol.* 1995;7:283-294.
11. Chisholm, K. A three year follow-up of attachment and indiscriminate friendliness in children adopted from Romanian orphanages. *Child Dev.* 1998;69:1092-1106.
12. Ministry of Justice. *Adoptie. Trends en analyse: Statistisch overzicht interlandelijke adoptie over de jaren 2004 tot en met 2008. [Adoption. Trends and Analysis: Statistical Overview of Inter-country Adoption during the Years 2004 to 2008].* The Hague. The Netherlands: Ministry of Justice; 2009.
13. Van Londen, W. M. *Gehechtheid in adoptiegezinnen. Intergenerationele overdracht en gedesorganiseerde gehechtheid. [Attachment in adoptive families. Intergenerational transmission and disorganized attachment.]* Unpublished doctoral dissertation. Utrecht, the Netherlands: Utrecht University. 2002.
14. Van IJzendoorn, MH, Schuengel, C, Bakermans-Kranenburg, MJ. Disorganized attachment in early childhood: Meta-analysis of precursors, concomitants, and sequelae. *Dev Psychopathol.* 1999;11:225-249.
15. Ainsworth, MDS, Blehar, MC, Waters, E, et al. *Patterns of attachment: A psychological study of the Strange Situation.* Hillsdale, NY: Erlbaum; 1978.

16. Main, M, Solomon, J. Procedures for identifying infants as disorganized/disoriented during the Ainsworth Strange Situation. In: Greenberg, MT, Cicchetti, D, Cummings, EM, eds. *Attachment during the preschool years: Theory, research, and intervention*. Chicago: University of Chicago Press; 1990:121-160.
17. Main, M, Hesse, E. Parents' unresolved traumatic experiences are related to infant disorganized attachment status: Is frightened and/or frightening parental behavior the linking mechanism? In: Greenberg, MT, Cicchetti, D, Cummings, EM, eds. *Attachment in the preschool years: Theory, research, and intervention*. Chicago: University of Chicago Press; 1990:161-182.
18. Richters, JE, Waters, E, Vaughn, BE. Empirical classification of infant-mother relationships from interactive behavior and crying during reunion. *Child Dev.* 1988;59:512-522.
19. Van IJzendoorn, MH, Kroonenberg, PM. Cross-cultural consistency of coding the Strange Situation. *Infant Behav Dev.* 1990;13:469-485.
20. Tabacknick, BG, Fidell, LS. *Using multivariate statistics*. 4th ed. Boston: Allen & Bacon; 2001.
21. Biringen, Z, Robinson, J, Emde, RN. Appendix B: The Emotional Availability Scales (3rd ed; an abridged infancy/early childhood version). *Attach Hum Dev.* 2000;2:256-270.
22. Vliegen, N, Luyten, P, Biringen, Z. A multimethod perspective on emotional availability in the postpartum period. *Parenting: Science and Practice.* 2009;9:228-243.
23. *Multinom for SPSS* [Computer Software]. Leiden, the Netherlands: Leiden University. 2009
24. Smyke, AT, Zeanah, CH, Fox, NA, et al. Placement in foster care enhances quality of attachment among young institutionalized children. *Child Dev.* 2010;81:212-223.
25. Stovall, KC, Dozier, M. The development of attachment in new relationships: Single subject analyses for 10 foster infants. *Dev Psychopathol.* 2000;12:133-156.
26. Vorria, P, Papaligoura, Z, Sarafidou, J, et al. The development of adopted children after institutional care: a follow-up study. *J Child Psychol Psychiatry.* 2006;47:1246-1253.
27. De Wolff, MS, Van IJzendoorn, MH. Sensitivity and attachment: A meta-analysis on parental antecedents of infant attachment. *Child Dev.* 1997;68:571-591.
28. McElwain, NL, Booth-LaForce, C. Maternal sensitivity to infant distress and nondistress as predictors of infant-mother attachment security. *J Fam Psychol.* 2006;20:247-255.
29. Dobrova-Krol, NA, Van IJzendoorn, MH, Bakermans-Kranenburg, MJ, et al. The importance of quality of care: Effects of perinatal HIV infection and early institutional rearing on preschoolers' attachment and indiscriminate friendliness. *J Child Psychol Psychiatry.* in press.
30. Van Schaik, R, Wolfs, TF, Geelen, SP. Improved general health of international adoptees, but immunization status still insufficient. *Eur J Pediatr.* 2009;168:1101-1106.

