



ELSEVIER

Infant Behavior & Development 23 (2000) 211–222

**Infant
Behavior &
Development**

Infant–care provider attachments in contrasting child care settings II: Individual-oriented care after German reunification

Lieselotte Ahnert^{a,*}, Michael E. Lamb^b

^a*Friedrich-Schiller-University, Jena, Germany*

^b*National Institute of Child Health and Human Development, Bethesda, MD, USA*

Received 2 June 2000; received in revised form 9 November 2000; accepted 9 February 2001

Abstract

Following the reunification of Germany, East German child care providers were urged to foster individual care provider-child relationships rather than peer relationships. In 1993–1997, the extent to which group- and dyadic-level measures of the care providers' behavior predicted variations in the security of infant–care provider attachment was studied in a sample of 70 German 11- to 20-month olds who were enrolled in child care facilities. Procedures and measures were the same as reported by Ahnert, Lamb, and Seltenheim (2000). Levels of care provider sensitivity and empathy were greater after reunification than before, and infants were more likely than those assessed prior to reunification to be securely attached to their care providers. Even though insecure attachments appeared to be common, disorganized patterns were infrequent. Measures of the care providers' sensitivity to individual infants did not predict attachment security although group-level differences in empathy were predictive. © 2000 Elsevier Science Inc. All rights reserved.

Keywords: Child care; Changes in child care practice; Infant-mother attachment; Infant–care provider attachment; Strange Situation; Care provider behavior

1. Introduction

When Germany was reunified in October 1990, the striking differences between East and West German public child care policies became highly controversial. Especially for children

* Corresponding author. Tel.: +49-0-3641/9-45212; fax: +49-0-3641/9-45202.

E-mail address: lieselotte.ahnert@karowberlin.de (L. Ahnert).

under three, child care was available to only 2% to 3% of the children in West Germany, while 7,700 child care centers served nearly 56% of the infants and toddlers in East Germany (Bundesministerium für Familie, Senioren, Frauen, und Jugend [BMFSFJ], 1994, p. 479). Because of its special status and location in the middle of East Germany, surrounded by a wall, the child care situation in West Berlin was strikingly different from the situation in the other parts of West Germany, with 20% of the children under three attending public child care facilities (for further discussion see Ahnert & Lamb, 2001). When both the abolition and reform of the East German child care system were advocated in a heated national debate, reformers argued that, because the East German system had fundamentally positive values and characteristics, it should be maintained and reformed. The Senat of the reunited Berlin considered child care to be an important resource for parents in Berlin even though birthrates dramatically declined in the East and families migrated westwards when the wall was breached. Thus, 37,000 unused child care slots were eliminated in East Berlin between 1990 and 1997, making it possible to offer an additional 14,000 slots in West Berlin. Reduced enrollment in the Eastern centers forced many to retain only those staff members willing to adapt to the new curricula and to complete 100-hr relicensing programs.

Following reunification, East Berlin child care centers began to develop new curricula, with age-mixed groups replacing many of the age-homogenous groups that had been typical in West Berlin public child care. The centers also developed more flexible curricula and daily routines to accommodate individual differences among children instead of emphasizing group-oriented rules, began attributing greater importance to infants' emotional needs than to cognitive stimulation, and redefined care providers as companions rather than teachers. Thus, whereas the child care centers previously sought to create, direct, and control egalitarian relationships among peers, care providers came to recognize their special roles as attachment figures, responsible for helping children, particularly infants, cope more effectively with stressful situations in child care. It remains unclear whether or not these changes in philosophy actually affected the behavior of care providers, and thus the goals of this study were to examine care provider behavior after reunification and to determine whether variations in care provider behaviors were associated with changes in the quality of infant–care provider attachments.

1.1. Attachments to child care providers

Howes and her colleagues used the Attachment Q-Set (AQS) to assess the security of attachments to child care providers (Howes & Hamilton, 1992a,b; Howes, Phillips, & Whitebook, 1992; Howes et al., 1990; Howes & Smith, 1995a,b). Observing children in multiple situations, the AQS permits a comprehensive characterization of children's secure-base behavior and personality attributes evident in the context of care provider-child interaction (Waters & Dean, 1985; revised version in Waters, 1995). Security scores on the AQS may range between -1.0 and 1.0 , with scores of 0.33 and higher deemed indicative of secure and scores of less than 0.33 of insecure attachments. Although Howes and Smith (1995a) were able to discern three profiles of child-care provider attachments—secure, avoidant, and difficult—that appeared analogous to the major attachment patterns evident in the Strange

Situation, it is not clear whether emergent relationships with those who care for children several hours each day in child care should be labeled attachments.

When Ainsworth's Strange Situation (Ainsworth & Wittig, 1969) and classificatory system (Ainsworth et al., 1978) have been used to describe the attachments between infants and their care providers, researchers have noted more insecure infant–care provider than infant–mother attachments, although no systematic associations between attachment security and the type of child care have been identified. Goossens and van IJzendoorn (1990) reported that 57% ($N = 75$) of the infant–care provider attachments in Dutch child care centers were secure, Ainslie (1990) reported that 52% ($N = 34$) of those studied in community-based American child care centers of moderate-to-good quality were secure, and 50% to 59% of the infant–metapelet relationships in Israeli kibbutzim with communal sleeping arrangements were secure compared with 44% to 63% of those in Israeli kibbutzim with family-based sleeping arrangements (Sagi et al., 1985, 1995). When attachment security was assessed using the AQS, 64% ($N = 42$) of 18- to 28-month-olds (Howes et al., 1990) and 39% ($N = 712$) of children under three (Howes & Smith, 1995a) from diverse child care settings appeared to be securely attached to their care providers. Insecure care provider attachments also become more common with age. Howes and Smith (1995a) found that as few as 11% ($N = 647$) of the 36- to 70-month-olds they studied were securely attached to their providers.

1.2. Associations between infant–care provider attachments and quality of care

Associations between the quality of care provider behavior and infant–care provider attachment have not been studied extensively (Lamb, 1998). Anderson, Nagle, Roberts, and Smith (1981) showed that infants observed in the laboratory tended to prefer interaction with highly involved rather than relatively uninvolved care providers. In child care, infants directed more positive affect to better trained and more experienced head teachers than to assistant teachers even when both were equally available (Rubenstein & Howes, 1979), although Barnas and Cummings (1994) found preferred care providers were not more likely to respond to infant signals. Interestingly, Sagi et al. (1995) have shown that infants in a group with two care providers tend to establish attachments of similar quality, suggesting that the care providers' specific behavior may systematically affect the quality of infant–care provider relationships. Goossens and van IJzendoorn (1990) rated care providers in one-on-one play sessions as even more sensitive than either mothers or fathers, although sensitivity appeared to fluctuate considerably in child care settings and thus may be poorly reflected by measures of sensitivity in the laboratory (Goossens & Melhuish, 1996). Various measures of providers' involvement in care (see Howes & Stewart, 1987) were also positively associated with AQS measures of child-care provider attachments (Howes et al., 1990; Howes & Hamilton, 1992a,b; Howes & Segal, 1993; Howes & Smith, 1995a,b). Both the security of attachment to primary care providers and levels of involved caregiving appeared to be stable in high-quality settings, however, whether or not the primary care providers changed (Howes, Galinsky, & Kontos, 1998; Howes & Hamilton, 1992b). Thus, the effects of care provider sensitivity on the formation of infant–care provider attachments in group care settings remain unclear.

In the present study, we sought to determine whether the patterns of care and attachment

security observed after reunification differed from those that had been observed prior to reunification (Ahnert, Lamb, & Seltenheim, 2000), and whether group- and dyadic-level measures of care provider behavior predicted variations in the security of infant–care provider attachment. We thus focused on secure-base behavior in Ainsworth’s Strange Situation and examined associations with the care providers’ behaviors in group settings. We assumed that the sensitivity of care providers to individual children might affect attachment security, and thus that secure infant–care provider attachments might be more likely after reunification than before.

2. Method

2.1. Participants

2.1.1. Infants

In 1993–1997, at least four years after the Berlin wall was breached, 70 infants were involved in a study which was designed to resemble a prereunification study (Ahnert, Lamb, & Seltenheim, 2000) as much as possible. Infants were healthy and between 11 and 20 months old ($M = 14.9$ months, $SD = 1.7$) at the time of child care entry. All had been born at term, and their Bayley (1993) Mental Development Index (MDI) scores averaged 105.4 ($SD = 9.1$). As in the prereunification study, all infants had been reared in their families, with their mothers as primary caretakers, until enrollment in child care. A comparison with the sociological microcensus of Berlin around that time (see Statistisches Landesamt Berlin, 1994) indicated that the parents were representative of middle-class families in Berlin. Three quarters of the 70 infants were firstborns, and 36 were girls. During the course of the study, six mothers decided to stay home with their infants.

2.1.2. Child care centers

Thirty-four child care centers located in four different parts of East Berlin (Prenzlauer Berg, Pankow, Friedrichshain, and Marzahn) were involved in the study. Each center served between 70 and 120 children. In contrast to the prereunification study, children were not all placed in age-homogenous groups. Instead, 21 of the target infants were in *small age-homogenous groups* with a mean of 9.2 infants ($SD = 1.1$) averaging 8.1 months of age ($SD = 2.7$); 20 of the target infants were in *small age-heterogeneous groups* with a mean of 9.7 children ($SD = 0.9$) averaging 21 months of age ($SD = 5.1$); 21 of the target infants were in *large age-heterogeneous groups* with a mean of 15.3 children ($SD = 4.0$) averaging 35.7 months of age ($SD = 16.0$); and the last two target infants were in *large age-homogenous groups* like those in the prereunification sample. Because this group only contained two infants, the large age-homogenous group was excluded from statistical analyses concerned with the effects of group composition. The care provider–child ratios were between 1:6 and 1:8 in all groups.

2.1.3. Care providers

Sixty-four care providers, ranging in age from 24 to 43 years ($M = 26.3$ years) with between 3 and 22 years of child care experience, took part in the study. 12% of the care

providers had only recently finished a 3-year course at one of the medical colleges, and were thus the least experienced. The remainder had been trained before reunification and were required after reunification to complete a 100-hr-long program, offered by the educational department of the Berlin Senat, in order to be relicensed. All of the care providers came from middle-class backgrounds, and most were head teachers in the group settings.

2.2. Procedures and measures

Each observation of the infants was scheduled along the same timeline and carried out using the procedures and measures described in the preceding report (Ahnert, Lamb, & Seltenheim, 2000). In brief, the infants were observed 1 to 2 days (Time 1), 2 to 4 weeks (Time 2), and 3 to 4 months (Time 3) after entry into child care. On each occasion, we videotaped the infants for 30 min when they arrived at the center and entered the group. Three coders who were blind with respect to the child's attachment history (with Cohen's kappa ranging from 0.78 to 0.89) rated care provider behavior from those tapes. Dyadic-level measures of the care providers' behavior were conceptually based on Ainsworth's sensitivity scale (Ainsworth, Bell, & Stayton, 1974) decomposed into two 5-point Likert scales (1) *Attentiveness* and (2) *Adequate Responsiveness*, whereas group-level measures relied on a German adaptation of Arnett's (1989) Global Scale of Caregiver Behaviors. These behavioral dimensions focused on the care providers' (3) *Empathy* (the extent to which care providers attend to and encourage individual infants), (4) *Punitiveness* (the importance placed on obedience in the group), (5) *Dedication* (the extent to which care providers captured infants' interest and were involved in their activities), and (6) *Permissiveness* (the extent to which the care providers limited the infants' activities [reverse-scored]).

Infants were also seen in the Strange Situation with their primary care providers 5 months after enrollment. These care providers had been the strangers when mothers were observed in the Strange Situation shortly before enrollment in child care. Infants were considered "nonattached" to their care providers when they did not socially reference them more in the second Strange Situation than in the first. Thirty eight percentage of the 134 tapes were coded independently by two of four coders (the first author, her assistant Katrin Seltenheim, Karin Grossmann, and Fabienne Becker-Stoll) using Ainsworth et al.'s (1978) and Main and Solomon's (1990) classification system. The inter-rater reliability, assessed using Cohens's kappa, reached 0.81.

3. Results

3.1. Infant attachments to care providers as compared to their mothers

Infants were more likely to have secure attachments to their mothers (49%) than to their care providers (39%), $\chi^2(1, N = 134) = 1.5, p < .05$. Disorganized [D] patterns were

Table 1
Patterns of attachment to mothers and care providers

	Attachment classification					Total
	Secure [B]	Insecure-avoidant [A]	Insecure-ambivalent [C]	Disorganized [D]	Nonattached	
Care provider	25 (39%)	24 (38%)	2 (3%)	5 (8%) ^a	8 (12%)	64 (100%)
Mother	34 (49%)	32 (46%)	3 (4%)	1 (1%) ^b	—	70 (100%)

Note.

^a 1 D/A1, 2 D/B2, 2 D/B4.

^b 1 D/B2.

infrequent, even among the infant–care provider attachments (5%), and 12% of the infants had not formed attachments to their primary care providers.

3.2. Factors associated with the security of infant–care provider attachment

In order to determine whether care provider behaviors predicted variations in the security of attachment, we first excluded the nonattached infants ($n = 8$) from the analyses. As the numbers of ambivalent [C] and disorganized [D] attachment patterns were small (see Table 1), we then combined them with the avoidant [A] attachments into a single insecure attachment category. A two-way (Attachment: secure and insecure; Time: 1–2 days, 2–4 weeks, 3–4 months after enrollment) repeated measures MANOVA with all care provider behaviors as dependent variables revealed a significant effect for attachment, $F(6, 49) = 8.1$, $p < .001$, time, $F(12, 43) = 7.8$, $p > .001$, and Attachment X Time interactions, $F(12, 43) = 81.3$, $p < .001$. Subsequent univariate analyses of variance (ANOVAs) revealed significant effects for attachment only on empathy, $F(1, 54) = 6.3$, $p < .05$, with secure infant–care provider attachments involving empathic care providers. Levels of empathy, $F(2, 108) = 4.3$, $p < .05$, and permissiveness, $F(2, 108) = 5.3$, $p = .007$, increased significantly over time. A significant Attachment X Time interaction on empathy, $F(2, 108) = 6.3$, $p = .003$, suggested that increasing levels of empathy were especially associated with secure infant–care provider attachments (Table 2).

After reunification, the group care arrangements varied along two dimensions—group size and age range. Group 1 comprised infants in *small age-homogeneous* groups ($n = 21$); Group 2 included those in *small age-heterogeneous* groups ($n = 20$); and Group 3 those in *large age-heterogeneous* groups ($n = 21$). The distributions of infant–care provider attachments in those groups differed significantly, $\chi^2(2, N = 62) = 8.26$, $p < .05$: secure infant–care provider attachments were much more common in Groups 1 (48%) and 3 (57%) than in Group 2 (15%) (see Table 3). Moreover, a one-factor MANOVA (Factor: Group composition) with all group-level measures of care provider behavior as dependent variables (see Table 4) revealed a significant effect of group composition, $F(4, 57) = 10.32$, $p < .05$. Subsequent univariate analyses showed that care providers were much more empathic in Groups 1 and 3 (where secure attachments were proportionally more common) than in Group 2 where secure infant–care provider attachments were less likely, $F(2, 59) = 4.57$, $p < .05$.

Table 2

Individual-level and group-level measures of care provider behavior as related to attachment

	Infant-care provider attachment					
	Secure [B]			Insecure [A & C]		
	Day 1–2 M (SD)	Week 2–4 M (SD)	Month 3–4 M (SD)	Day 1–2 M (SD)	Week 2–4 M (SD)	Month 3–4 M (SD)
<i>Individual-level</i>						
Attentiveness ^a	3.1 (1.0)	3.6 (0.9)	3.5 (1.1)	3.1 (1.4)	2.8 (0.9)	3.0 (1.2)
Adequate Responsiveness ^a	3.3 (1.1)	3.2 (0.9)	3.4 (1.2)	3.3 (1.4)	2.9 (0.9)	3.3 (0.8)
<i>Group-level</i>						
Empathy ^b	6.5 (1.9)	6.4 (1.4)	6.0 (1.5)	5.5 (2.0)	4.5 (1.6)	4.6 (1.8)
Punitiveness ^b	3.8 (1.7)	4.8 (1.9)	4.5 (1.8)	4.2 (1.8)	5.4 (2.0)	5.1 (1.9)
Disinterest vs. Dedication ^b	4.6 (1.4)	5.3 (1.8)	4.4 (1.7)	4.7 (1.9)	5.3 (1.5)	5.0 (1.8)
Control vs. Permissiveness ^b	3.4 (1.9)	3.7 (1.6)	3.7 (1.4)	4.4 (1.5)	4.6 (1.5)	3.9 (1.4)

Note.

^a Scores range on 5-point scales.

^b Scores range on 9-point scales.

Data were z-transformed for analyses of variance.

3.3. Care provider behaviors and the security of infant–care provider attachment before and after reunification

In order to learn about the changes in care provider behaviors before and after reunification, we compared care provider behaviors in the *prereunification* and *postreunification* samples, including Bonferroni corrections (see Table 5). A two-way repeated measures MANOVA (Reunification: before and after; Time: 1–2 days, 2–4 weeks, 3–4 months after enrollment) with all care provider behaviors as dependent variables revealed a highly significant effect for reunification, $F(6, 97) = 26.47, p < .001$, but no significant effects for time, and no significant Reunification \times Time interaction. Subsequent univariate analyses revealed that levels of empathy were greater in the postreunification sample, $F(1, 102) = 11.35, p < .001$. Postreunification care providers were also more attentive, $F(1, 102) =$

Table 3

Infant-care provider attachment in different care groups

Subsample	Infant-care provider attachment					Total
	Secure [B]	Insecure-avoidant [A]	Insecure-ambivalent [C]	Disorganized [D]	Nonattached	
Group 1	10 (48%)	6 (29%)	2 (9%)	3 (14%) ^a		21 (100%)
Group 2	3 (15%)	11 (55%)		1 (5%) ^b	5 (25%)	20 (100%)
Group 3	12 (57%)	5 (24%)		1 (5%) ^c	3 (14%)	21 (100%)
Total	25 (39%)	22 (38%)	2 (3%)	5 (8%)	8 (12%)	62 ^d (100%)

^a 1 D/A1, 1 D/B4, 1 D/B2.

^b 1 D/B4.

^c 1 D/B2.

^d Two avoidant infants were excluded, as they were enrolled in neither of the groups.

Table 4
Group-level measures of care provider behavior in different care groups

Care provider behaviors	Group composition (n = 62) ^a						F (2, 59)	p
	Group 1		Group 2		Group 3			
	M	SD	M	SD	M	SD		
Empathy	5.43	1.87	4.22	2.33	6.73	1.27	4.57	.002*
Punitiveness	4.77	2.03	5.61	2.06	3.68	2.04	2.29	.11
Disinterest vs. Dedication	4.45	1.86	4.50	2.77	4.59	0.92	0.02	.98
Control vs. Permissiveness	3.89	1.64	4.67	2.00	3.45	1.44	1.33	.28

^a Two infants were excluded, as they were enrolled in neither of the groups.

56.34, $p < .001$, and more responsive, $F(1, 102) = 46.35$, $p < .001$, than care providers in the prereunification sample.

Not surprisingly, infants were more likely to form secure attachments with their care providers after German reunification (39%) than before (20%), $\chi^2(1, N = 104) = 4.1$, $p < .05$. Disorganized patterns were only frequent after reunification, $\chi^2(1, N = 104) = 13.9$, $p < .001$.

4. Discussion

The analyses reported here show that secure infant-mother attachments were equally likely before and after the reunification of Germany, confirming reports by Ahnert, Krätzig, Meischner, and Schmidt (1994) that state doctrines on education had little effect on social-

Table 5
Care provider behaviors measured before and after German reunification

Care provider behaviors	Pre-reunification (n = 40) ^a						Post-reunification (n = 64)					
	Day 1–2		Week 2–4		Month 3–4		Day 1–2		Week 2–4		Month 3–4	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Attentiveness ^b	1.35	0.98	1.93	1.06	1.44	0.73	3.28	1.03	3.21	0.85	3.05	1.18
Adequate responsiveness ^b	1.12	0.15	1.43	0.81	1.55	0.82	3.42	1.12	3.21	0.94	3.45	0.98
Empathy ^c	3.56	1.09	4.24	1.43	4.52	1.05	6.13	1.58	5.58	1.15	5.64	1.19
Punitiveness ^c	4.05	1.39	4.98	1.63	5.04	1.48	3.98	1.58	5.20	1.98	4.85	1.54
Disinterest vs. Dedication ^c	5.30	1.67	4.87	1.87	4.75	1.54	4.76	1.65	5.43	1.41	4.76	1.39
Control vs. Permissiveness ^c	5.18	1.07	6.02	1.45	5.30	0.79	3.90	1.62	4.34	1.57	3.95	0.87

Note.

^a Data from Ahnert, Lamb, & Seltenheim (2000).

^b Scores range on 5-point scales.

^c Scores range on 9-point scales.

Data were z-transformed for analyses of variance.

ization practices within East German families. In addition, the distributions across attachment categories, with 50% (prereunification) and 49% (postreunification) secure, are within the range of between 33% to 56% reported in other German studies in which D ratings were considered (see review by Gloger-Tippelt, Vetter, & Rauh, 2000).

By contrast, the overall political changes and changes in the organization of child care associated with reunification appeared to affect care providers' behavior. Most (88%) of the care providers we studied began working before reunification. During this period, East German medical colleges had equipped care providers with a thorough understanding of cognitive, motor, and social development in infancy, as well as familiarity with play techniques and safety rules. These elements remained a part of care provider education after reunification, and thus levels of dedication and punitiveness did not differ before and after. However, even though the former curriculum emphasized the importance of warm relationships with children and their parents, East German care providers before reunification believed that they were expected to create a pleasant atmosphere rather than to foster empathic group contact and personalized interactions. The postreunification retraining program and in-service training that focused especially on socioemotional issues may therefore have affected caregiving practices significantly (see also Howes, Hamilton, & Philipsen, 1998). In addition, the pressures to accommodate the political changes (Schroeder, 1997; Youniss, 1995), alongside a dramatic decrease in birth rates and in the number of child care centers available, forced many care providers out of work. Only the staff members who were most willing to embrace the new practices were retained. Specifically, our observations over a 4-month period revealed that group activities and control predominated before reunification, whereas empathic behaviors in the group context, as well as attentiveness and responsiveness to individual infants, were consistently higher following reunification than before. Clearly, however, those differences in care provider behavior were associated with a host of changes in physical facilities, child care philosophy, and care providers' attitudes, and we were not able to determine which of the factors was most influential.

Care provider behavior in the contrasting care settings (see also Ahnert, Lamb, & Seltenheim, 2000) was characterized by low (prereunification) as opposed to high (postreunification) levels of sensitivity and empathy. Not surprisingly, secure infant-care provider attachments were more common after reunification than before. Although inclusion of the D rating procedure elucidated differences between the pre- and postreunification samples, it also inflated the number of insecure infant-care provider attachments identified. When the "secure" infants with D features were placed in the major (secure [B]) category, the proportion (45%) of secure infant-care provider attachments in the postreunification sample was comparable to the proportions of secure attachment in other studies in which D features were not rated (Ainslie, 1990; Goossens & van Ijzendoorn, 1990; Sagi et al., 1985, 1995). The results of all of these studies suggest that insecure attachments to care providers are rather common in many countries, not only in Germany.

Our focus on contrasting German child care settings, however, allowed us to reexamine the meaning of infant-care provider attachments, with attachment quality viewed as an organizer of the infants' behavioral responses to anxiety, anger, and sadness associated with

the separation experiences implicit in child care. Because it is the most reliable, valid, and well-studied index of attachment security (Grossmann, Grossmann, & Zimmermann, 1999), we used Ainsworth's Strange Situation, rather than the AQS, to assess attachment, but conducted the research in a way that allowed us to distinguish between attached and nonattached infants who otherwise would appear insecure. We examined care provider behaviors in different group care arrangements during and following the time when the infants were dropped off by their mothers, as this was the time when substitute attachment figures should have been sought out.

Attachment theory predicts that sensitive care provider–infant interaction should be associated with secure attachments (see review by De Wolff & van IJzendoorn, 1997). Yet even though the care providers appeared to be more attentive and responsive to the target children after reunification (when secure infant–care provider attachments were also more common), there were no significant associations between care provider sensitivity and the security of infant–care provider attachments in either sample. This suggests that the determinants of infant–mother and infant–care provider attachments may differ in important ways. In addition, individual differences in empathy, a measure of the care providers' group-level rather than dyadic-level behavior, proved more valuable predictively than individual differences in sensitivity. We found higher levels of care provider empathy in groups with higher rates of secure infant–care provider attachments, making our findings consistent with Sagi et al.'s (1985, 1995) observations that group constellation and dynamics foster similar infant–care provider attachments among infants with the same care providers. In our study, care provider empathy involved selective problem-oriented sensitivity to the right signals at the right time in order to address the infants' everyday stress and needs. Obviously, much more research is needed to elucidate and explain this association.

Overall, the fact that group-level variables were more predictive than dyadic-level variables may suggest that infant–mother and infant–care provider attachments are functionally and developmentally different. Infants who are securely attached to their mothers do not necessarily form secure attachments to their care providers. Infants might be viewed as avoidant of care providers when they are merely being casual about close bodily contact, and care providers might be interchangeable for them (Howes, Galinsky et al., 1998). Perhaps infants who seek little comfort from care providers simply view them as companions or guides, rather than as intimates or attachment figures. It is therefore not surprising that Sagi et al. (1995, p. 83) reported the highest rates of insecure infant–metapelet attachments among kibbutz-reared infants who slept in their parents' apartments rather than in central infant quarters (56% in two subsamples of the study). Clearly, it is important to recognize that adults may play a variety of important roles in children's lives, and that diverse forms of attachment to nonparental care providers must be studied.

Acknowledgments

This research was supported by grants from the German Science Foundation (Deutsche Forschungsgemeinschaft) to Lieselotte Ahnert (Az.: Ah 55/2-4 and Ah 55/7-1) and by the

Intramural Research Program at the National Institute of Child Health and Human Development. The paper is dedicated to the East Berlin child care centers involved in the study as well as to the infants and mothers who made the research possible. Special thanks to the ICARS team in Berlin for collecting the data. We are especially grateful to K. Seltenheim and P. Weise for performing the behavioral codings, as well as K. Grossmann and F. Becker-Stoll (University of Regensburg) for conducting and rechecking the attachment classifications.

References

- Ahnert, L., & Lamb, M. E. (2001). The East German child care system: associations with caretaking and caretaking beliefs, children's early attachment and adjustment. *American Behavioral Scientist*, *44*, 1843–1863.
- Ahnert, L., Lamb, M. E., & Seltenheim, K. (2000). Infant-care provider attachments in contrasting child care settings I: group-oriented care after German reunification. *Infant Behavior and Development*, *23*, 197–209.
- Ahnert, L., Krätzig, S., Meischner, T., & Schmidt, A. (1994). Sozialisationskonzepte für Kleinkinder. Wirkungen tradierter Erziehungsvorstellungen und staatssozialistischer Erziehungsdoktrinen im intra- und interkulturellen Ost-West-Vergleich [Socialization conceptions for infants. Effects of traditional and state-socialist educational doctrines in intra- and intercultural East-West comparisons]. In G. Trommsdorff (Ed.), *Psychologische Aspekte des sozio-politischen Wandels in Ostdeutschland [Psychological aspects of the sociopolitical change in East Germany]* (pp. 94–110). Berlin, Germany and New York: Walter de Gruyter Verlag.
- Ainslie, R. C. (1990). Family and center contributions to the adjustment of infants in full-time day care. *New Directions for Child Development*, *49*, 39–52.
- Ainsworth, M. D. S., Bell, S. M., & Stayton, D. J. (1974). Infant-mother attachment and social development: "Socialization" as a product of reciprocal responsiveness to signals. In M. P. M. Richards (Ed.), *The integration of a child into a social world* (pp. 99–135). New York: Cambridge University Press.
- Ainsworth, M. D. S., Blehar, M. C., Waters, E., & Wall, S. (1978). *Patterns of attachment. A psychological study of the Strange Situation*. Hillsdale, NJ: Erlbaum.
- Ainsworth, M. D. S., & Wittig, B. A. (1969). Attachment and exploratory behavior of one-year-olds in a strange situation. In B. M. Foss (Ed.), *Determinants of infant behavior* (Vol. 4, pp. 111–136). London: Methuen.
- Anderson, C. W., Nagle, R. J., Roberts, W. A., & Smith, J. W. (1981). Attachment to substitute caregivers as a function of center quality and caregiver involvement. *Child Development*, *52*, 53–61.
- Arnett, J. (1989). Caregivers in daycare centers: does training matter? *Journal of Applied Developmental Psychology*, *10*, 541–552.
- Barnas, M. V., & Cummings, E. M. (1994). Caregiver stability and toddlers' attachment-related behavior towards caregivers in day care. *Infant Behavior and Development*, *17*, 141–147.
- Bayley, N. (1993). *Bayley scales of infant development*. New York: Psychological Corporation.
- Bundesministerium für Familie, Senioren, Frauen, und Jugend (BMFSFJ) (1994). *Neunter Jugendbericht [Nineth report on youth]*. Bonn: Bonner Universitäts-Buchdruckerei.
- De Wolff, M. S., & van IJzendoorn, M. H. (1997). Sensitivity and attachment: a meta-analysis on parental antecedents of infant attachment. *Child Development*, *68*, 571–591.
- Gloger-Tippelt, G. S., Vetter, J., & Rauh, H. (2000). Untersuchungen mit der "Fremden Situation" in deutschsprachigen Ländern: Ein Überblick [Studies using the Strange Situation in German speaking countries: A review]. *Psychologie in Erziehung und Unterricht*, *47*, 87–98.
- Goossens, F., & Melhuish, E. C. (1996). On the ecological validity of measuring the sensitivity of professional caregivers: the laboratory versus the nursery. *European Journal of Psychology of Education*, *11*, 169–176.
- Goossens, F. A., & van IJzendoorn, M. H. (1990). Quality of infants' attachments to professional caregivers: relation to infant-parent attachment and day-care characteristics. *Child Development*, *61*, 832–837.
- Grossmann, K. E., Grossmann, K., & Zimmermann, P. (1999). A wider view of attachment: stability and change

- in attachment and exploration during the years of immaturity. In J. Cassidy & P. R. Shaver (Eds.), *Attachment: handbook of theory, research, and clinical applications* (pp. 760–786). New York: Guilford.
- Howes, C., Galinsky, E., & Kontos, S. (1998). Child care caregiver sensitivity and attachment. *Social Development, 7*, 25–36.
- Howes, C., & Hamilton, C. E. (1992a). Children's relationships with caregivers: mothers and child care teachers. *Child Development, 63*, 859–866.
- Howes, C., & Hamilton, C. E. (1992b). Children's relationships with child care teachers: stability and concordance with parental attachments. *Child Development, 63*, 867–878.
- Howes, C., Hamilton, C. E., & Philipson, L. C. (1998). Stability and continuity of child-caregiver and child-peer relationships. *Child Development, 69*, 418–426.
- Howes, C., Phillips, D. A., & Whitebook, M. (1992). Thresholds of quality: implications for the social development of children in center-based child care. *Child Development, 63*, 449–460.
- Howes, C., Roding, C., Galluzzo, D. C., & Myers, L. (1990). Attachment and child care: relationships with mother and caregiver. In N. Fox & G. Fein (Eds.), *Infant day care: the current debate* (pp. 169–182). Norwood, NJ: Ablex.
- Howes, C., & Segal, J. (1993). Children's relationships with alternative caregivers: the special case of maltreated children removed from their homes. *Journal of Applied Developmental Psychology, 14*, 71–81.
- Howes, C., & Smith, E. W. (1995a). Children and their child care caregivers: profiles of relationships. *Social Development, 4*, 44–61.
- Howes, C., & Smith, E. W. (1995b). Relations among child care quality, teacher behavior, children's play activities, emotional security, and cognitive activity in child care. *Early Childhood Research Quarterly, 10*, 381–404.
- Howes, C., & Stewart, P. (1987). Child's play with adults, toys, and peers: an examination of family and childcare influences. *Developmental Psychology, 23*, 423–430.
- Lamb, M. E. (1998). Nonparental child care: context, quality, correlates, and consequences. In W. Damon, I. E. Sigel, & K. A. Renninger (Eds.), *Handbook of child psychology: child psychology in practice* (5th ed., Vol. 4, pp. 73–133). New York: Wiley.
- Main, M., & Solomon, J. (1990). Procedures for identifying infants as disorganized/disoriented during the Ainsworth Strange Situation. In M. T. Greenberg, D. Cicchetti, & E. M. Cummings (Eds.), *Attachment in the preschool years: theory, research and intervention* (pp. 121–160). Chicago: University of Chicago Press.
- Rubenstein, J. L., & Howes, C. (1979). Caregiving and infant behavior in day care and in homes. *Developmental Psychology, 15*, 1–24.
- Sagi, A., Lamb, M. E., Lewkowicz, K. S., Shoham, R., Dvir, R., & Estes, D. (1985). Security of infant-mother, -father, and -metapelet attachments among kibbutz reared Israeli children. *Monographs of the Society for Research in Child Development, 50*, 257–275.
- Sagi, A., van IJzendoorn, M. H., Aviezer, O., Donnell, F., Koren-Karie, N., Joels, T., & Harel, Y. (1995). Attachments in multiple-caregiver and multiple-infant environment: the case of the Israeli kibbutzim. *Monographs of the Society for Research in Child Development, 60*, 71–91.
- Schroeder, H. (1997). Psychosocial stress and the process of coping among East German migrants. In I. Al-Issa & M. Tousignant (Eds.), *Ethnicity, immigration, and psychopathology* (pp. 121–133). New York: Plenum Press.
- Statistisches Landesamt Berlin (1994). *Bevölkerung und Privathaushalte im Mai in Berlin 1993, Ergebnisse des Mikrozensus Teil II, Ost-West-Vergleich [Population and households in Berlin, May 1993. Results of an East-West comparison; part II]*. Berlin, Germany: Eigenverlag.
- Waters, E. (1995). The Attachment Q-Set (Version 3.0). *Monographs of the Society for Research in Child Development, 60*, 71–91.
- Waters, E., & Deane, K. E. (1985). Defining and assessing individual differences in attachment relationships: Q-methodology and the organization of behavior in infancy and early childhood. *Monographs of the Society for Research in Child Development, 50*, 257–275.
- Youniss, J. (Ed.) (1995). After the wall: family adaptations in East and West Germany. *New directions for child development (Vol. 70)*. San Francisco: Jossey-Bass.