

In a multiple caretaker environment, nonparental caregivers can be important attachment figures with considerable impact on children's later socioemotional development.

The Multiple Caretaker Paradox: Data from Holland and Israel

*Marinus H. van IJzendoorn, Abraham Sagi,
Mirjam W. E. Lamberon*

Although Bowlby always resisted identifying the “mother figure” with the child’s biological mother and emphasized the possibility of other caregivers—such as fathers or grandmothers—serving as attachment figures, there are two reasons to believe that he considered mothers in Western societies as the principal attachment figures. First, he was convinced that only a stable relationship with regularly recurring interaction episodes could lead to a harmonious “match” between both partners. His “law of continuity” implies that “the more stable and predictable the regime, the more secure a child’s attachment tends to be; the more discontinuous and unpredictable the regime, the more anxious his attachment” (Bowlby, 1975, p. 261). In Western societies, the biological mother is more likely to create this condition of continuity. Second, Bowlby was convinced that babies and young children (below three years) are unable to preserve internal representations of the caregivers’ availability in their absence; children will be confident about their attachment figures’ availability only when they are actually present (Bowlby, 1975, p. 237). Therefore, his “law of accumulated separation experiences” states that “effects of separations from mother during the early

Preparation of this chapter was supported by a Pioneer Grant from the Netherlands Organization for Scientific Research and by a grant from the Scheidegger Corporation to Marinus H. van IJzendoorn. Parts of this chapter were presented at the biennial meeting of the Society for Research in Child Development, Seattle, Washington, April 17–20, 1991. The authors thank M. Bakermans-Kranenburg, K. Haak, H. Zwart-Woudstra, A. van Busschbach, and W. Visser for their assistance in data collection and analysis.

years are cumulative and . . . the safest dose is therefore a zero dose" (Bowlby, 1975, p. 255). It is once again in Western societies that the biological mother is more likely to have the opportunity to be permanently available to the young child.

Monotropy

Against this background, the concept of "monotropy" appears to be a logical implication of fundamental ideas in attachment theory. Literally interpreted, the Greek word *monotropy* means being fed or raised by only one person, that is, the mother. Nevertheless, the concept of monotropy does not seem to fit well into recent developments in attachment theory and practice. First, in present-day Western societies, permanent availability of one and the same attachment figure does not occur in the majority of families in which often more than one child is raised, and in which the parent has to fulfill other responsibilities than just child rearing, often because of economic necessity. Under such circumstances, Bowlby's law of continuity may have to be reformulated to imply the constant availability of an attachment figure, whoever the particular person is. If the child is part of a network of attachment figures, separation from one attachment figure, such as the mother, may not mean separation from every secure base; on the contrary, a separation from the mother during part of the day may imply the presence of the father or a professional caregiver to fulfill the role of attachment figure (Van IJzendoorn and Tavecchio, 1987).

At the same time, a multiple caretaker arrangement does not necessarily mean that children relate to more than one figure in a way that may be called "attachment." Morelli and Tronick (1991), for example, observed that Efe infants (Pygmies from Zaire, Africa) develop primary attachments to their mothers by twelve months of age in the context of experiencing sensitive multiple caregiving during the first year of life. One of the factors determining the development of monotropy within an extended child-rearing arrangement is supposed to be the care at night: infants are cared for solely by their mothers during the night and sleep is interrupted by bouts of social interaction exclusively between mother and infant. The importance of the sleeping arrangement has been made clear in a recent study on home-based and communal kibbutzim (Sagi and others, 1992). The communal sleeping arrangement appeared to be somewhat detrimental to the security of infant-mother attachment as compared to the home-based arrangement in which the infants sleep at home. If mothers take care of their children at night, it may set the groundwork for a special and primary attachment relationship to develop, whatever other caregivers are involved in raising the children

Multiple Caretaker Paradox

The only nonmaternal caregiver who has been studied extensively in the past decade is the father figure (see Fox, Kimmerly, and Schafer, 1991, for a metaanalysis on mother-father studies). From these studies, it cannot be derived that fathers are able to establish an attachment relationship equivalent to the infant-mother attachment in every respect. For example, it was concluded that, together, infant-mother and infant-father attachments were more powerful in predicting the child's concurrent behavior than was the infant-mother relationship alone (Main and Weston, 1981; Main, Kaplan, and Cassidy, 1985). In the long term, however, infant-mother attachment appeared to be a better predictor of attachment at six years of age (Main, Kaplan, and Cassidy, 1985). Main and her colleagues suggested that a hierarchy of internal working models of attachment exists in which the mother stands foremost and the father is represented as a subsidiary attachment figure. Indeed, Lamb (1977, 1978) showed that young infants prefer their mothers when distressed, even though most are clearly attached to both parents.

Studies on attachment between infants and professional caregivers are even more scarce (Krentz, 1983). One of the most salient and highly replicated findings is that the quality of attachment relationships with different caretakers is often discordant. The discordance of secure, resistant, and avoidant patterns with respect to father and to mother has been shown by Lamb (1977), Main and Weston (1981), Grossmann, Grossmann, Huber, and Wartner (1981) and Sagi and others (1985). The same lack of concordance of attachment quality within a broader network of infant-caretaker relationships was found in Sagi and others (1985), Goossens and Van IJzendoorn (1990), and Krentz (1983) for infant-parent and infant-professional caregiver relationships. The implications of this basic finding of discordance are far-reaching. Because the infant-mother attachment can predict later socioemotional functioning, an intriguing issue is whether discordant relationships with nonmaternal caretakers can have the same predictive power. If the infant-mother attachment relationship is secure and therefore predicts positive peer interactions (Sroufe, Fox, and Pancake, 1983), what influence may in that case be left for an insecure infant-caregiver relationship? It is hardly imaginable that the same child's insecure relationship with a nonmaternal caregiver would have the opposite effect, that is, would stimulate negative peer interactions. But it is also difficult to imagine that the effect would be positive.

Attachment research can follow at least two different strategies to address the multiple caretaker paradox. First, one may doubt the validity of the nonmaternal attachment measures; more radically, it may even be doubted whether a real attachment relationship exists between a child and a nonmaternal caregiver.

and a nonmaternal caretaker. The Strange Situation procedure as well as its derivative measures, such as the Attachment Q-Sort, are validated against home observations of mother-infant interactions, and there are few data on the validity of these measures for relationships with other caretakers. Moreover, these instruments might assess aspects of the child-caretaker relationship other than attachment. Second, presupposing the existence of infant attachment to nonmaternal caretakers, one may ask how the child internally organizes different attachment relationships. Infant-mother attachment classifications do not predict later socioemotional development exhaustively; in fact, associations with security of the infant-mother relationship are only modest. If children integrate their attachment experiences with different caretakers, later socioemotional development may be better predicted on basis of the quality of the attachment network than through the quality of the infant-mother attachment alone.

In this chapter, we address two questions involved in the multiple caretaker paradox: Do infant-nonmaternal caregiver attachment relationships exist, and, if so, how are multiple attachments interrelated? In trying to answer both questions, we focus on infants' relationships with nonparental caregivers.

Do Infant-Caregiver Attachment Relationships Exist?

To answer this important question, we need criteria to evaluate whether a relationship is correctly identified as an attachment relationship. Bowlby's (1984, p. 371) definition of attachment may imply some of these criteria: "To say of a child that he is attached to, or has an attachment to, someone means that he is strongly disposed to seek proximity to and contact with a specific figure and to do so in certain situations, notably when he is frightened, tired or ill." From this definition, it may be derived that in a stressful circumstance such as the Strange Situation infants should show differential attachment behavior to their professional caregiver compared to a stranger. In the Ainsworth, Blehar, Waters, and Wall (1978) coding system, secure and ambivalent children are discriminated from avoidant children on basis of interactive behavior toward the stranger and the attachment figure. Secure and ambivalent children should distinguish between their attachment figure and an unknown person; in the Strange Situation, avoidant children will not necessarily make this distinction. If a relationship with a professional caregiver can be considered an attachment relationship, we should not find an overrepresentation of attachments classified as avoidant in professional caregiver samples. Differential behavior toward stranger and caregiver indicates secure and ambivalent relationships to be attachment relationships—according to Bowlby's definition and the coding system. In case of child-caregiver relationships classified as avoidant, it is unknown whether the relation-

ship is a truly avoidant attachment or does not contain elements of attachment.

Furthermore, we would expect that infant-caregiver relationships can at least be considered classifiable according to the established coding system, because classifiability would mean that a restricted number of coherent strategies for dealing with the stressful situation are being detected (Main, 1990). In case of unclassifiable infant-caregiver relationships, we should doubt the existence of an attachment in the usual sense. An overrepresentation of unclassifiable cases may throw doubt on the existence of a coherent infant-caregiver attachment strategy to deal with stressful situations.

When infant-caregiver interactions during the Strange Situation are classified as attachments, discordance with the infant-parent attachment classification is to be expected. Because attachment is considered a unique reflection of the dyad's history of interactions, the infant-caregiver classification is required to be independent from other attachment relationships that the child has developed.

Another set of criteria for identifying infant-caretaker attachment relationships may be derived from our expectations about external correlates of Strange Situation classifications. We expect infant-mother classifications to be predicted by maternal sensitivity and to be predictive of later socioemotional development (Ainsworth, Blehar, Waters, and Wall, 1978; Sroufe, Fox, and Pancake, 1983). Therefore, infant-caregiver classifications should also be predicted by the caregiver's sensitivity—in the day-care setting or in the laboratory. Sensitivity to infant's signals should lead to secure attachments, whereas insensitive interactions should predict insecure attachments. Furthermore, infant-caregiver classifications should have predictive validity. Secure attachments should be related to more optimal socioemotional functioning in toddlerhood or kindergarten age, whereas anxious infant-caregiver attachments should lead to less optimal functioning. The predictive validity may be domain-specific, and especially present in out-of-home contexts.

In sum, we have derived five criteria to test whether infant-caregiver relationships are correctly identified as attachment relationships: (1) Infant-caregiver samples do not show an overrepresentation of avoidant classifications. (2) Infant-caregiver samples do not show an overrepresentation of unclassifiable cases. (3) Infant-caregiver classifications are independent of infant-parent classifications. (4) Caregiver's sensitivity is related to the infant-caregiver Strange Situation classifications. (5) Infant-caregiver classifications predict later socioemotional functioning.

How Are Multiple Attachments Interrelated?

When a child grows up in an extended child-rearing environment and has to deal intensively with multiple caretakers, the issue of the relations

among multiple attachments becomes important. Four models may be suggested to describe this issue. In the context of Dutch dual-earner families or Israeli kibbutz children, at least three caretakers are involved in raising the children: mother, father, and professional caregiver. The first model is *monotropy* (Bowlby, 1951). As already shown, this model implies that only one figure—mostly the mother—is an important attachment figure, and the influence of other caretakers is marginal, at least in terms of attachment. The second model is *hierarchy* (Bowlby, 1984). As discussed before, in this model, one caretaker—again, mostly the mother—is the most important attachment figure, but other caretakers may be considered subsidiary attachment figures who may serve as a secure base in case the principal attachment figure is not available. The third model is *independence*. This model implies that a child may be attached similarly to several different caretakers, but the attachment relationships may be functional only in those domains in which the child and a specific caretaker have been interacting over a long period of time. Each caretaker specializes in a certain domain, and only in that domain the bond with the child is effective as a secure base. The fourth model is *integration*. In case of a network of three attachment relationships, secure attachments may compensate for insecure attachments. The child would be optimally functioning in a network of three secure relationships, but two secure relationships would be better than one, and the child would be worst off if the attachment network only consists of insecure relationships.

From the monotropy model, we may derive the prediction that only the infant-mother attachment is related to later socioemotional functioning. Other caregivers are unimportant and ineffective in determining children's development. From the hierarchy model, the prediction may be derived that the infant-mother attachment relationship is the most powerful determinant of children's socioemotional development but not the only factor involved. Other attachments may also be predictive in a weaker sense, independently of the specific developmental domain. The independence model may suggest that children's attachments to all three caretakers are equally important in determining later socioemotional functioning, but different caretakers influence different aspects of children's development, depending on their "specialization." Last, the integration model proposes that the most powerful predictor of later socioemotional development involves the quality of the entire attachment network. In this view, attachments of the same child with different attachment figures influence each other. The role of professional caregivers is emphasized by predicting that the extended attachment network is more strongly related to later socioemotional functioning than is the family attachment network containing only parental attachments.

Because similar studies on infant-caregiver attachment relationships

were carried out in Israel and Holland, we combined evidence from these studies in our research on the multiple caretaker paradox. The combination of studies has two distinctive advantages. First, conclusions may be based on a firmer empirical foundation; second, crosscultural variations in our data may lead to new insights into the potentials and limits of the role of the nonparental caregiver in children's development.

Procedures of Our Studies

The Dutch and Israeli studies on professional caregivers have similar designs. Both studies are longitudinal: Initial measurements took place when the children were one to two years old; in Holland, the follow-up took place two years later, whereas in Israel they were completed at five years of age. Fathers, mothers, and professional caregivers were involved in both studies; they participated in the Strange Situation procedure with the infants in their care. Both studies included similar follow-up measures for socioemotional and cognitive functioning.

Dutch Study. Eighty children, along with their mothers, fathers, and professional caregivers, served as subjects in this study. The children were all healthy and born at full term, and all families were intact, dual-earner families from a middle-class background. The children were twelve months of age. Five families excluded from an earlier report because the mothers worked less than fifteen hours per week (Goossens and Van IJzendoorn, 1990) were included in the follow-up study. At the second session, about two years later, sixty-eight children with their parents and professional caregivers participated. Families not participating in the follow-up did not differ in socioeconomic status, parental sensitivity, or quality of attachment from those who did participate.

At the first assessment, infants were observed in the Strange Situation procedure and in a free-play session with their three caregivers separately, in counterbalanced order (see Goossens and Van IJzendoorn, 1990, for details). At the second session, children were again invited to our laboratory twice: once with their mother and once with their father, in a counterbalanced order. During this second series of visits, the California Child Q-Sort (CCQ; Block and Block, 1980; Van Lieshout and others, 1983) and the McCarthy Developmental Scales (MDS; Van der Meulen and Smrkovsky, 1985) were completed (as well as some other measures not reported on here). Preschool teachers were asked to complete the Preschool Behavior Inventory (PSBI; Hess, 1966), and the experimenters completed a readiness-to-interact scale. The CCQ is designed to measure ego resilience, ego control, and field independence. Resilience is defined as the competence to react flexibly but also persistently in problem situations. Control is interpreted as the disposition to express impulses and emotions. Field independence is a cognitive style

that implies relative absence of distraction by irrelevant features of the problem situation (Block and Block, 1980). The MDS measures cognitive competence and yields a developmental quotient (DQ). The PSBI is designed to measure children's social behavior in terms of independence, aggression, social-verbal competence, and timidity. The readiness-to-interact scale is a rating scale that measures the degree to which the children are ready and willing to interact with an unknown experimenter during the first few minutes of their initial encounters. Reliability of all measures was satisfactory.

Israeli Study. Eighty-six infants were involved in the first assessments at eleven to fourteen months of age. They were observed in the Strange Situation procedure together with their mothers, fathers, and professional caregivers (metaplot). They belonged to fifteen kibbutzim in the northern part of Israel, seven kibbutzim from the United Kibbutz Movement (Takam), and eight kibbutzim from the Arzi movement (Sagi and others, 1985). At the second session, about three and one-half years later, fifty-nine children were retested. Thirty metaplot and thirty kindergarten teachers provided descriptions of the children included in the follow-up. Children not participating in the follow-up (because of technical constraints) did not differ from the original group on distribution of attachment classifications (Oppenheim, Sagi, and Lamb, 1988).

At the first assessment, infants were observed in the Strange Situation procedure with their three caregivers separately, and in a counterbalanced order. The kibbutz early child care coordinators completed questionnaires containing items on the interaction history of child and metapelet; the metapelet's own parental status, experience, training, and desire for the job; and other variables related to the parents (see Sagi and others, 1985, for details). At the second assessment, children were observed in their own living quarters with the Peer Play Scale (PPS; Howes, 1980). Also, the following tests were administered: Kagan Parent Role Test (KPRT; Kagan and Lemkin, 1960), WPSSI IQ test (Lieblich, 1974), Interpersonal Awareness Test (IAT; Borke, 1971), and Stanford Preschool Internal-External Scale (SPIES; Mischel, Zeiss, and Zeiss, 1974). Kindergarten teachers and metaplot completed the CCQ (Block and Block, 1980) and the Preschool Behavior Q-Sort (PBQ; Baumrind, 1968, 1971), respectively. The PPS measures six different levels of play, for example, parallel play and reciprocal play. The KPRT was used to assess the subjects' perceptions of their parents in terms of punitiveness, nurturance, and salience. The WPSSI tests intelligence and generates an IQ index. The IAT was used to assess the child's empathy, operationally defined as the ability to perceive the feelings of another child. The SPIES is a measure for locus of control. The PBQ was designed to assess interpersonal behavior in terms of friendliness, cooperativeness, tracta-

bility, submissiveness, goal directedness, achievement orientation, and independence (see Oppenheim, Sagi, and Lamb, 1988, for details on those measures). All measures showed a satisfactory reliability.

It is important to note that for both the Dutch and Israeli studies, professional caregivers involved in the first assessment were different from those involved in the second assessment. In Holland, most day-care centers have a policy of changing caregiver and group at around the age of one and one-half years, and in Israeli kibbutzim, children are routinely assigned to new metaplot when they move from infancy to toddlerhood.

Results and Discussion

In the following sections we present results from the analysis of the Dutch and Israeli data sets regarding the validity of infant-caregiver attachments and the organization of multiple attachments.

Do Infant-Caregiver Attachment Relationships Exist? To evaluate the validity of infant-caregiver Strange Situation classifications, we described five criteria: (1) Infant-caregiver samples should not show an overrepresentation of avoidant classifications. (2) Infant-caregiver samples should not show an overrepresentation of unclassifiable cases. (3) Infant-caregiver classifications are independent of infant-parent classifications. (4) Caregiver's sensitivity is related to the infant-caregiver classifications. And (5) infant-caregiver classifications predict later socioemotional functioning.

In Table 1.1, the percentage distributions of infant-caregiver and infant-parent classifications for both the Dutch and Israeli subjects are presented. From this table, it can be seen that there are only small differences in percentages between avoidant classifications in the three subsamples for both countries, and that there is only a slight overrepresentation of unclassifiable cases for the caregivers in the Dutch sample, but not in the Israeli sample. Furthermore, in earlier reports, we showed that the classifications to the caregiver and to the mother were not related, nor were the classifications to the caregiver and to the father for the Dutch sample (Sagi and others, 1985; Goossens and Van IJzendoorn, 1990). In the Dutch case, the concordance between the infant's attachment classifications to both parents was even significantly stronger than the association between infant-caregiver and infant-parent attachment classifications. In their metanalysis Fox, Kimmerly, and Schafer (1991) found a weak but significant association between infant-mother and infant-father classifications. This may be explained by parents modeling each other's caregiving strategies. Professional caregivers have less opportunity to model parental interactions with the infant.

In searching for determinants of infant-caregiver attachment security, Goossens and Van IJzendoorn (1990) found caregivers of secure

Table 1.1. Percentage Distributions of Infant-Caregiver and Infant-Parent Attachment Classifications in the Dutch and Israeli Samples

Attachment Classifications	Holland			Israel		
	Caregiver (N = 75)	Mother (N = 75)	Father (N = 75)	Caregiver (N = 58)	Mother (N = 56)	Father (N = 55)
Avoidant	28	21	31	12	7	11
Secure	57	68	64	50	54	65
Ambivalent	8	9	4	38	39	24
Unclassified	7	1	1			

Source: Adapted from Goossens and Van IJzendoorn, 1990; and Oppenheim, Sagi, and Lamb, 1988.

infants to be more sensitive to infants' signals during free play as compared to caregivers with whom infants had developed anxious attachment relationships. In a small study on thirty professional caregivers, we found evidence that sensitivity measured in a free-play session in the laboratory correlates with sensitivity in a day-care group (Oosterwijk and Reitsma, 1986). Because the caregiver's sensitivity was not included in the Israeli study, this validity issue still begs for further examination in the Israeli case. Indirect evidence is suggestive though, from the following metaplot data.

Our fifth criterion states that infant-caregiver classification should predict children's later socioemotional functioning. In the Dutch study, we performed a discriminant function analysis using the PSBI scales for Independence, Timidity, Aggressiveness, and Social-Verbal Competence, and a readiness-to-interact scale as "predictors" of avoidant, resistant, and secure attachment to the caregiver. Because sex of child has been shown to make a difference in terms of social competence in preschool (Zaslow and Hayes, 1986), we controlled for sex of child. Furthermore, to show whether infant-caregiver attachment is uniquely related to the social competence variables, we also controlled for quality of the attachment network in the family. Sex of child and quality of the attachment network were introduced first into the hierarchical discriminant function, and the social competence variables were introduced in a second step. In Table 1.2, the results of this discriminant function analysis are presented. From this table, it can be derived that avoidant children are more aggressive and more independent in preschool, and less ready to interact with a stranger than are children who were securely attached to their professional caregivers in their second year of life. Resistant children tended to be somewhat more aggressive than secure or avoidant children.

In the Israeli study, multivariate analyses of variance were used to determine whether children classified in the secure group with their metaplot differed from ambivalent children on the peer play, parent-role perception, empathy, and locus-of-control dependent measures (Oppenheim, Sagi, and Lamb, 1988). Too few avoidant infant-caregiver classifications were involved to allow for separate analyses on the two insecure groups. Three out of four multivariate analyses revealed significant differences between the secure and ambivalent children. Children classified as secure with their metaplot were more empathic, dominant, purposive, achievement-oriented, and independent than were the ambivalent children. They were also significantly more ego undercontrolled than the ambivalent subjects (Oppenheim, Sagi, and Lamb, 1988). All of these differences were in the direction predicted on the basis of prior attachment research on mothers (Erickson, Sroufe, and Egeland, 1985; Van IJzendoorn, Van der Veer, and Van Vliet-Visser, 1987). Therefore,

Table 1.2. Results of Discriminant Function Analysis of Social Competence Variables

Social Competence	Avoidant	Secure	Resistant	Correlations of Predictors with		Univariate F(2,35)
	M (N = 14)	M (N = 33)	M (N = 9)	Discriminant Functions 1	Discriminant Functions 2	
Independence ^a	108	95	98	60	—	27
Sex ^a	17	14	13	45	43	22
Readiness ¹	436	509	478	-40	—	12
Social-verbal	136	130	120	—	—	10
Family attitude ^a	23	23	19	—	54	12
Aggressiveness ^a	53	46	59	32	-49	17
Timidity	55	60	63	—	—	4

^a $p < .05$

these findings lend some support to the predictive validity of the attachment classifications involving kibbutz-reared Israeli infants with their metaplot.

According to our five criteria for evaluating the validity of infant-caregiver Strange Situation classifications, we have reason to believe that children are able to develop an attachment relationship to their professional caregivers. Infant-caregiver samples do not show an overrepresentation of avoidant classifications, and the number of unclassifiable cases is very limited. Furthermore, infant-caregiver classifications do not appear to be simple copies of infant-parent classifications; they seem to reflect the caregiver-infant interaction history in terms of sensitivity; and, last, infant-caregiver classifications are related to children's later socioemotional functioning. Of course, this conclusion depends on the specific child-rearing arrangements in Israeli kibbutzim or in Dutch dual-earner families. In both cases, the professional caregivers had been intensively involved in rearing the infant from at least three months prior to the first Strange Situation measurements. In both cases, the quality of the care provided is relatively high (Goossens and Van IJzendoorn, 1990; Sagi and others, 1985), and the infants were born in well-educated, predominantly middle-class families.

Furthermore, we should also qualify our tentative conclusion that the infant-caregiver relationship really is an attachment relationship. First, the correlational design of our studies precludes definite conclusions about cause and effect (Lamb, Thompson, Gardner, and Charnov, 1985). Second, the bond between caregiver and child is disrupted during the preschool period, in Israel as well as in Holland. The internal representation of a disrupted attachment relationship may have some specific qualities and characteristics different from the representation developed through interactions with stable attachment figures such as parents.

How Are Multiple Attachments Interrelated? We formulated four different models to describe attachment in a multiple caretaker environment: monotropy, hierarchy, independence, and integration. We also derived specific predictions from these models that we tested with our Dutch and Israeli data.

In Table 1.3, data on the different models are presented. We compared the predictive power of infant-mother attachment with that of the family and that of the extended network. Quality of infant-mother attachment was transformed into a continuous scale by assigning numbers to classification types according to the following rule: A and C (1); B4 (2); B1 and B2 (3); B3 (4). This transformation is based on the proposition by Main, Kaplan, and Cassidy (1985) that implies that B1, B2, and B4 receive the same, intermediate security status. We decided to assign the B4 children to a somewhat lower security scale score because of earlier research on this marginal group (Van IJzendoorn, Van der Veer, and Van Vliet-Visser, 1987; Sagi and others, 1985).

Table 1.3. Correlations Between Security of Attachment
(Mother, Family Network, Extended Network) and Children's Developmental Status

Children's Development	Holland			Israel		
	Mother	Family	Extended	Mother	Family	Extended
Developmental quotient/Intelligence quotient	-.03	.16	.20 ^c	.26	.38 ^d	.31 ^c
Resilience	-.03	-.06	-.12	-.05	.42 ^d	.35 ^d
Undercontrol	-.01	.08	.05	.00	.20	.38 ^d
Field independence	-.07	-.06	-.14	.08	.41 ^d	.34 ^c
Hostility ^a	—	—	—	-.11	-.02	-.03
Resistance ^a	—	—	—	-.01	.00	.03
Intractability ^a	—	—	—	.09	.07	.14
Dominance ^a	—	—	—	.15	.23	.31 ^c
Goal directed ^a	—	—	—	.04	.36 ^d	.47 ^d
Achievement ^a	—	—	—	.15	-.02	.16
Independence ^a	—	—	—	.18	.27 ^c	.33 ^c
Peer play	—	—	—	.02	.06	-.02
Empathy	—	—	—	.04	.20	.34 ^c
Locus of control	—	—	—	-.15	-.10	-.15
Sociability ^b	-.02	.00	.02	—	—	—
Timidity ^b	.04	.10	.08	—	—	—
Aggressiveness ^b	.08	-.22	-.14	—	—	—
Independence ^b	.32 ^d	.08	.25 ^c	—	—	—
Readiness	-.18	-.02	-.11	—	—	—

^a From the Preschool Behavior Q-Sort of Baumrind, 1968, 1971.

^b From the Preschool Behavior Inventory of Hess, 1966.

^c $p < .05$

The quality of the family attachment network was estimated according to the following rule: both attachments insecure (1); one of the attachments insecure and the other attachment secure (2); both attachments secure (3). Finally, the quality of the extended attachment network was computed as follows: three attachments insecure (1); two attachments insecure, one secure (2); one attachment insecure, two attachments secure (3); three attachments secure (4).

In Table 1.3, correlations of these security scales with several measures for children's cognitive and socioemotional development are presented. Because the security scales for mother, mother and father, and mother, father, and professional caregiver are continuous, the sizes of the correlations are comparable. From this table, it can be derived that in the Dutch sample security of extended network was related to the MDS scales for developmental quotient and autonomous behavior in preschool. Infant-mother attachment was only related to autonomous preschool behavior. There were no significant correlations between any of the attachment indices and resilience, undercontrol, or field independence. The predictive power of the extended attachment network is somewhat better than that of the family attachment network and of the separate infant-parent attachments.

The predictive power of attachment in the Israeli sample was much more impressive. A secure extended network was related to a higher IQ and to more independent behavior in kindergarten. This result replicates the Dutch data described before. Furthermore, extended network attachment was related to ego resilience, ego control, and field independence, as well as to dominance and goal-directed behavior in kindergarten and to empathy. The direction of these relations is in accordance with previous research results concerning the effects of infant-mother attachment (Sroufe, Fox, and Pancake, 1983; Van IJzendoorn, Van der Veer, and Van Vliet-Visser, 1987); their strength is impressive. The quality of the family attachment network was significantly related to fewer variables (five) than was the extended network (eight). The quality of family network was not related to ego control, dominance, and empathy in kindergarten. Even more remarkable is the complete lack of significant correlations for the quality of infant-mother attachment in the Israeli study.

We also partialled out IQ and DQ scores from our analyses in order to exclude the possibility that children's socioemotional development may be confounded with their IQ or DQ. But partialing IQ or DQ did not change the correlations in significant ways. IQ scores and other outcome measures at age five were independently predicted from quality of attachment as assessed during infancy. Intelligence also was best predicted on basis of quality of attachment networks. These intriguing and replicated findings further support the hypothesis of a relation between attachment and cognition (Bus and Van IJzendoorn, 1988).

The Israeli data do not support the monotropy model at all. Non-maternal caregivers such as father and metaplot may indeed be important attachment figures determining the course of the children's development in their care. There was also little support for the hierarchy model. Against the background of our data, it does not make sense to consider nonmaternal caregivers only as subsidiary attachment figures. The inclusion of fathers and professional caregivers in the prediction of children's development on basis of their earlier attachment experiences increased the predictive power considerably. At least in a kibbutz child-rearing arrangement, and to a lesser extent in Dutch dual-earner families, the hierarchy model neglects the important contribution of nonmaternal caregivers to the children's feelings of security and their development. It is more difficult, however, to evaluate the independence and integration models against our data. Oppenheim, Sagi, and Lamb (1988) seem to support the independence model in stating that the infant-metaplot attachments were related to later social functioning in children's houses and kindergartens. This finding was interpreted as consistent with the fact that metaplot directly socialize children in this out-of-home context on a daily basis. The correlates of kibbutz infant-mother and infant-father relationships were hypothesized to be limited to home and family contexts.

In Table 1.3, however, we presented several significant correlates of the family attachment network in an out-of-home context. These data seem to clarify the earlier interpretation of the independence model. It should be recalled that previous strategies to analyze multiple attachment relationships were inspired by the monotropy model, and therefore every single infant-adult relationship was tested separately. Now, with our new strategy of developing a "network scale," qualitative network assumptions were operationalized in terms of a continuous scale, which has proved useful and revealing. More specifically, we have shown that the combination of infant-mother and infant-father attachments, but not the separate relationships, was predictive of later cognitive and socio-emotional functioning, which may be interpreted as support for the integration model. Addition of the metaplot to the attachment network would in that case lead to even stronger predictions—and Table 1.3 shows this to be the case.

This network approach should be looked upon differently from previous findings in several studies in which it was shown that the quality of attachment relationships with different caretakers was discordant (Lamb, 1977; Main and Weston, 1981; Grossmann, Grossmann, Huber, and Wartner, 1981; Sagi and others, 1985). Although Sagi and others (1985) handled the data in terms of dependence without suggesting implications for the integration of these discordant internal working models (Bretherton, 1985), the network approach can be viewed as a new move toward a more complex consideration of how different inter-

nal working models of attachment relationships might integrate and relate to other indices of development.

Of course, we have to qualify the support for the integration model in several ways. First, we found much stronger relations in the Israeli study than in the Dutch study, although the Dutch data do not contradict our conclusions. Procedural differences in these studies may explain the different findings. In the kibbutz study, nonparental caregivers were heavily involved in assessing the children's development at kindergarten age. In the Dutch study, the parents were responsible for assessing the children's ego resilience and control. Although the parental CCQ version has been thoroughly validated in Holland (Van Lieshout and others, 1983), nonparental caregivers may have a somewhat more "objective" perspective on children's functioning in comparison to peers. In the Dutch case, the MDS and the PSBI showed some relation with attachment, and parents were not involved in completing these measures.

Second, crosscultural differences also may account for the differences in outcome between the Dutch and Israeli studies. In the Dutch case, dual-earner families are a relatively new phenomenon. In Holland, the participation rate of mothers of young children in the labor force has been one of the lowest in Europe. We cannot digress on the specific historical reasons for this situation (see Clerks and Van IJzendoorn, 1992, for a detailed description), but dual-earner families are still considered a minority and generally seen as negative examples of child rearing. The social prejudices against day care may cause stresses on all caregivers involved (not only the parents) and may override the influence of attachment relationships on children's development. In the kibbutz context, nonparental care is, of course, integrated and accepted, and the social context is favorable to this arrangement of an extended network of caretakers. In the "natural laboratory" of the kibbutz, the consequences of shared caretaking may therefore be much more clearcut.

Finally, it should be recalled that the kibbutz sample considered here entirely represented children living in a communal sleeping arrangement. Because the negative influence of sleeping out of home is clear now (Sagi and others, 1992), the importance of the integration model can be more vigorously examined under this unusual circumstance. The situation of being "deprived" at night may leave more room for the influence of a network of attachment relationships relative to that of separate attachment relationships.

Conclusion

The multiple caretaker paradox describes the contradictions involved in the discordance of infants' attachments to different caretakers. How can attachment be predictive of socioemotional development if the child is

attached in a different way to different caretakers? Two questions were raised: Are children really attached to nonparental caregivers? And how are multiple attachments interrelated?

In answering the first question, we proposed five criteria to evaluate whether relationships can be characterized as attachments. On the basis of data from a Dutch and an Israeli study of infant-mother, -father, and -caregiver attachments, we concluded that infants may be considered attached to their professional caregiver. It remains unclear, however, in what ways the children digest the "loss" of their professional caregivers, who change on a regular basis. This early loss may make the mental representation of the nonparental attachment different from that of the parental attachment. This loss notwithstanding, the first infant-caregiver attachment appeared to be a strong predictor of later socioemotional development, especially in the Israeli case.

In addressing the second question, we proposed four models of interrelation between multiple attachments: monotropy, hierarchy, independence, and integration. Evaluating these models against our data from Holland and Israel, we found some support for the integration model: In a multiple caretaker environment, it appears to make a difference whether the child has developed none, one, two, or three secure attachments. Children appear to profit most from three secure relationships. If their attachments to their mothers are insecure and their attachments to fathers and professional caregivers secure, however, they are better off compared to the situation in which the insecure infant-mother relationship is not compensated by secure attachments to other caregivers. We emphasized, though, that a definitive choice between the independence and the integration models is difficult to make. Further research with more extensive measures of children's socioemotional development in different situations (home, day care) and in less unusual social environments is needed to find a way out of the multiple caretaker paradox.

References

- Ainsworth, M. D. S., Blehar, M. C., Waters, E., and Wall, S. *Patterns of Attachment: A Psychological Study of the Strange Situation*. Hillsdale, N.J.: Erlbaum, 1978.
- Baumrind, D. *Manual for the Preschool Behavior Q-Sort*. Berkeley: Department of Psychology, University of California, Berkeley, 1968.
- Baumrind, D. "Current Patterns of Parental Authority." *Developmental Psychology Monographs*, 1971, 4 (1, pt. 2).
- Block, J. H., and Block, J. "The Role of Ego Control and Ego Resiliency in the Organization of Behavior." In W. A. Collins (ed.), *Development of Cognition, Affect, and Social Relations*. Minnesota Symposia on Child Psychology, vol. 13. Hillsdale, N.J.: Erlbaum, 1980.
- Borke, H. "Interpersonal Perception of Young Children: Egocentrism or Empathy?" *Developmental Psychology*, 1971, 5, 263-269.
- Bowlby, J. *Maternal Care and Mental Health*. Geneva, Switzerland: World Health Organization, 1951.

- Bowlby, J. *Attachment and Loss*. Vol. 2: *Separation, Anxiety, and Anger*. Harmondsworth, England: Penguin, 1975.
- Bowlby, J. *Attachment and Loss*. Vol. 1: *Attachment*. (2nd ed.) London, England: Penguin, 1984.
- Bretherton, I. "Attachment Theory: Retrospect and Prospect." In I. Bretherton and E. Waters (eds.), *Growing Points of Attachment: Theory and Research*. Monographs of the Society for Research in Child Development, vol. 50, nos. 1-2 (serial no. 209). Chicago: University of Chicago Press, 1985.
- Bus, A. G., and Van IJzendoorn, M. H. "Mother-Child Interactions, Attachment, and Emergent Literacy: A Cross-Sectional Study." *Child Development*, 1988, 59, 1262-1273.
- Clerkx, L. E., and Van IJzendoorn, M. H. "Child Care in a Dutch Context: On the History, Current Status, and Evaluation of Nonmaternal Child Care in the Netherlands." In M. E. Lamb, K. J. Sternberg, C. P. Hwang, and A. G. Broberg (eds.), *Child Care in Context: Crosscultural Perspectives*. Hillsdale, N.J.: Erlbaum, 1992.
- Erickson, M. F., Sroufe, L. A., and Egeland, B. "The Relationship Between Quality of Attachment and Behavior Problems in Preschool in a High-Risk Sample." In I. Bretherton and E. Waters (eds.), *Growing Points of Attachment: Theory and Research*. Monographs of the Society for Research in Child Development, vol. 50, nos. 1-2 (serial no. 209). Chicago: University of Chicago Press, 1985.
- Fox, N. A., Kimmerly, N. L., and Schafer, W. D. "Attachment to Mother/Attachment to Father: A Meta-Analysis." *Child Development*, 1991, 62, 210-225.
- Goossens, F. A., and Van IJzendoorn, M. H. "Quality of Infants' Attachment to Professional Caregivers: Relation to Infant-Parent Attachment and Daycare Characteristics." *Child Development*, 1990, 61, 832-837.
- Grossmann, K. E., Grossmann, K., Huber, F., and Wartner, U. "German Children's Behavior Towards Their Mothers at 12 Months and Their Fathers at 18 Months in Ainsworth's Strange Situation." *International Journal of Behavioral Development*, 1981, 4, 157-181.
- Hess, R. D. *Techniques for Assessing Cognitive and Social Abilities of Children and Parents in Project Headstart*. Report No. OE0519. Chicago: University of Chicago Press, 1966.
- Howes, C. "Peer Play Scale as an Index of Complexity of Peer Interaction." *Developmental Psychology*, 1980, 16, 371-372.
- Kagan, J., and Lemkin, J. "The Child's Differential Perception of Parental Attributes." *Journal of Abnormal and Social Psychology*, 1960, 61, 440-447.
- Krentz, M. S. "Qualitative Differences Between Mother-Child and Caregiver-Child Attachments and Infants in Family Day Care." Paper presented at the biennial meeting of the Society for Research in Child Development, Detroit, Michigan, March 1983.
- Lamb, M. E. "Father-Infant and Mother-Infant Interaction in the First Year of Life." *Child Development*, 1977, 48, 167-181.
- Lamb, M. E. "Qualitative Aspects of Mother-Infant and Father-Infant Attachment." *Infant Behavior and Development*, 1978, 1, 265-275.
- Lamb, M. E., Thompson, R. A., Gardner, W. P., and Charnov, E. L. *Infant-Mother Attachment: The Origins and Developmental Significance of Individual Differences in Strange Situation Behavior*. Hillsdale, N.J.: Erlbaum, 1985.
- Lieblich, A. *WPPSI Manual*. Jerusalem, Israel: Psychological Corporation, Hebrew University, 1974.
- Mam, M. "Cross-Cultural Studies of Attachment Organization: Recent Studies, Changing Methodologies, and the Concept of Conditional Strategies." *Human Development*, 1990, 33, 48-61.
- Mam, M., and Weston, D. R. "The Quality of the Toddler's Relationship to Mother and to Father: Related to Conflict Behavior and the Readiness to Establish New Relationships." *Child Development*, 1981, 52, 932-940.
- Mam, M., Kaplan, N., and Cassidy, J. "Security in Infancy, Childhood, and Adulthood: A Move to the Level of Representation." In I. Bretherton and E. Waters (eds.), *Growing Points of Attachment: Theory and Research*. Monographs of the Society for Research in Child Development, vol. 50, nos. 1-2 (serial no. 209). Chicago: University of Chicago Press, 1985.

- Mischel, W., Zeiss, R., and Zeiss, H. "Internal-External Control and Persistence: Validation and Implications of the Stanford Preschool Internal-External Scale." *Journal of Personality and Social Psychology*, 1974, 19, 265-278.
- Morelli, G. A., and Tronick, E. Z. "Efe Multiple Caretaking and Attachment." In J. L. Gewirtz and W. M. Kurtines (eds.), *Intersections with Attachment*. Hillsdale, N.J.: Erlbaum, 1991.
- Oosterwijk, T., and Reitsma, J. "Crecheleidsters en hun sensitiviteit" [Sensitivity of day-care providers]. Unpublished master's thesis, Department of Clinical Education, Leiden University, The Netherlands, 1986.
- Oppenheim, D., Sagi, A., and Lamb, M. E. "Infant-Adult Attachments in the Kibbutz and Their Relation to Socioemotional Development 4 Years Later." *Developmental Psychology*, 1988, 24, 427-433.
- Sagi, A., and others. "Security of Infant-Mother, -Father, -Metapelet Attachments Among Kibbutz-Reared Israeli Children." In I. Bretherton and E. Waters (eds.), *Growing Points of Attachment: Theory and Research*. Monographs of the Society for Research in Child Development, vol. 50, nos. 1-2 (serial no. 209). Chicago: University of Chicago Press, 1985.
- Sagi, A., and others. "Sleeping Out of Home in a Kibbutz Communal Arrangement: It Makes a Difference for Infant-Mother Attachment." Unpublished manuscript, Department of Psychology, Haifa University, Israel, 1992.
- Sroufe, L. A., Fox, N.A., and Pancake, V. R. "Attachment and Dependency in Developmental Perspective." *Child Development*, 1983, 54, 1615-1627.
- Van der Meulen, B. F., and Smrkovsky, M. *MOS 2½-8½. McCarthy Ontwikkelingsschalen* [McCarthy Developmental Scales]. Lisse, The Netherlands: Swets and Zeitlinger, 1985.
- Van IJzendoorn, M. H., and Tavecchio, L.W.C. "The Development of Attachment Theory as a Lakatosian Research Program: Philosophical and Methodological Aspects." In L.W.C. Tavecchio and M. H. van IJzendoorn (eds.), *Attachment in Social Networks: Contributions to the Bowlby-Ainsworth Attachment Theory*. Amsterdam, The Netherlands: Elsevier Science, North-Holland, 1987.
- Van IJzendoorn, M. H., Van der Veer, R., and Van Vliet-Visser, S. "Attachment Three Years Later. Relationships Between Quality of Mother-Infant Attachment and Emotional/Cognitive Development in Kindergarten." In L.W.C. Tavecchio and M. H. van IJzendoorn (eds.), *Attachment in Social Networks: Contributions to the Bowlby-Ainsworth Attachment Theory*. Amsterdam, The Netherlands: Elsevier Science, North-Holland, 1987.
- Van Lieshout, C.F.M., and others. *Zelfstandigheidsontwikkeling in het basisonderwijs* [Autonomy in elementary school]. Intern Rapport 83 ON 04, SVO-Project BS560. Nijmegen, The Netherlands, 1983.
- Zaslow, M. J., and Hayes, C. D. "Sex Differences in Children's Responses to Psychosocial Stress: Towards a Cross-Context Analysis." In M. E. Lamb, A. L. Brown, and B. Rogoff (eds.), *Advances in Developmental Psychology* Vol. 4. Hillsdale, N.J.: Erlbaum, 1986.

MARINUS H. VAN IJZENDOORN is professor of child and family studies at Leiden University, The Netherlands. His research interests concern attachment and methodology.

ABRAHAM SAGI is professor of psychology at Haifa University, Israel. His research interests concern attachment and policy issues.

MIRJAM W. E. LAMBERMON is interested in research and clinical implications of attachment theory.