ATTACHMENTS IN A MULTIPLE-CAREGIVER AND MULTIPLE-INFANT ENVIRONMENT: THE CASE OF THE ISRAELI KIBBUTZIM

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Most infants are raised in an environment that contains more than one caregiver and more than one child, interacting on a regular basis with their mothers, fathers, grandparents, and siblings as well as with baby-sitters or professional caregivers. Similarly, both parents and nonparental caregivers very often establish attachments with more than one child. Nevertheless, until relatively recently, attachment research has focused mainly on the attachment relationship of only the mother and with only one of her children, and the most widely used assessments of attachment quality—the Strange Situation procedure (Ainsworth, Blehar, Waters, & Wall, 1978) and the security scores derived from the Attachment Q-Set (Vaughn & Waters, 1990; Waters & Deane, 1985)—had been validated only for infant-mother dyads.

During the last decade, infant-father relationships came to be studied more intensively (for a meta-analysis of these studies, see Fox, Kimmerly, & Schafer, 1991), and some observational studies of infant attachments to nonfamilial caregivers have been reported (Anderson, Nagle, Roberts, & Smith, 1981; Goossens & van Ijzendoorn, 1990; Howes & Hamilton, 1992a,...

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Some work has also focused on the mother's attachment relationships with more than one of her children, be they siblings (Teti & Ablard, 1989; Ward, Vaughn, & Robb, 1988) or twins (Goldberg, Perrotta, Minde, & Corter, 1986; Minde, Corter, Goldberg, & Jeffers, 1990). Focus on the potential network of attachment relationships that are formed by infants and toddlers has raised important conceptual questions (van IJzendoorn, Sagi, & Lambermon, 1992). For example, Do infants develop attachments to their nonparental, professional caregivers? If so, can the quality of these attachments be described validly using existing procedures? And is the quality of attachment relationships that a nonfamilial caregiver establishes with different children likely to be congruent or incongruent—that is, do caregivers tend to behave in ways that potentiate similar attachment qualities across different children in their care? Finally, are the attachment relationships that the child co-constructs with different caregivers likely to be concordant or nonconcordant with respect to their quality?

Regarding the first of these questions, accumulating evidence suggests that infants do construct attachment relationships with nonparental caregivers who care for them on a regular basis and for a sufficiently long period of time. In a recent analysis (van IJzendoorn, Goldberg, Kroonenberg, & Frenkel, 1992), a number of criteria were specified for evaluating whether a relationship is correctly identified as an attachment relationship; this analysis has suggested that young children are indeed able to develop an attachment relationship with their professional caregiver. For example, using both Strange Situation and Q-sort techniques, an infant's attachment relationships with professional caregivers have been shown to exist and to be independent of the quality of the attachments that the child forms with the parents (Goossens & van IJzendoorn, 1990; Howes & Hamilton, 1992a, 1992b; Sagi et al., 1985). Moreover, the quality (i.e., Strange Situation classification) of the infant-caregiver bond appeared to be related to the caregiver's sensitivity in the same way as it is in the case of infant-parent attachments (Goossens & van IJzendoorn, 1990). Additionally, among children living in Israeli kibbutzim, the quality of the attachments formed between infants and their metaplot (Hebrew for “caregivers”; singular, metapelet) was found to predict theoretically relevant aspects of the child's later socioemotional functioning (Oppenheim, Sagi, & Lamb, 1988).

Taking this evidence as sufficient to permit at least provisional assumption of the reality of child-caregiver attachments, we focused in this study on the congruence of the quality of attachments that two children form with the same caregiver and on the concordance of the attachments that two caregivers form with the same child. The research was conducted in Israeli kibbutzim.

**Congruence of the quality of attachment of two (or more) children to a single**
This topic has been an important theoretical issue ever since the introduction of the concept of intergenerational transmission of attachment (Bowlby, 1973; Main, Kaplan, & Cassidy, 1985). Studies in which the Adult Attachment Interview (Main & Goldwyn, 1994) was used to address this concept have reported impressive correspondence between the parent’s working model of attachment (or attachment representations) and the infant-parent attachment relationship as assessed in the Strange Situation. Main and Goldwyn (in press-b), for example, reported a correspondence of 75% between measures using the traditional three-way Strange Situation classifications (i.e., anxious-avoidant, secure, and anxious-ambivalent), and this level of correspondence has been replicated in several additional studies (for a review, see van IJzendoorn, 1992; for a meta-analysis, see van IJzendoorn, 1995).

The assumption underlying the concept of intergenerational transmission is that the adult’s working model of attachment is expressed in caregiving behaviors and that these then determine the infant’s attachment relationship to that adult. Implied by this assumption is the proposition that, as long as rearing conditions and the children’s characteristics remain comparable, a caregiver would tend to establish similar attachment relationships with the different children in her or his care. Some evidence to support this hypothesis comes from studies of siblings (Teti & Ablard, 1989; Ward et al., 1988) that have indicated that, in approximately 50%–60% of cases, both children have the same, secure or insecure, relationship with their parent; in three small-scale studies of twins, the reported 30%–50% congruence is of less impressive magnitude (Minde et al., 1990; Szajnberg, Skrinjaric, & Moore, 1989; Vandell, Owen, Wilson, & Henderson, 1988).

The kibbutz provides a unique opportunity to evaluate the congruence hypothesis. The caregiving arrangements, the socioeconomic circumstances, the time frame, and the children’s ages are all similar, but the children are not biologically related either to the caregiver or to each other; thus, confounding intergenerational transmission with biological relatedness can be avoided (van IJzendoorn, 1992). Some data supporting the congruence hypothesis under such circumstances were reported by Sagi et al. (1985), who found that, in 12 of 16 cases in which a metapelet cared for different children, congruent Strange Situation classifications of these children’s attachment relationships with her were obtained. The authors interpreted this finding as indicating that most caregivers behave in characteristic ways that potentiate either secure or insecure attachments with the infants in their care.

Concordance of a child’s attachment relationships with different caregivers.—The possibility that a child would construct nonconcordant relationships with different caregivers—a notion that is implied by the concept of attachment as a characteristic of relationships—raises additional theoretical issues.
Sroufe (1985) has argued that each caregiver relates to a given child in a unique fashion and that it is the given caregiver's behavior, rather than any endogenous trait of the child (such as temperament), that determines the nature of the attachment relationship. Even though some associations between temperamental variability and attachment behavior have been documented (Belsky & Rovine, 1987; Vaughn, Lefever, Seifer, & Barglow, 1989), theorists continue to emphasize that the child's attachment relationship is shaped by the behavior of the particular caregiver and that quality of attachment to different caregivers might consequently not be concordant (Sroufe, 1985; van IJzendoorn, Goldberg, Kroonenberg, & Frenkel, 1992).

In the case of the child's attachments to both parents, similarity in the parents' caregiving behavior—and a consequent concordance in the quality of the child's attachments to the two—might be explained by the similarity of attachment representations between the spouses. In their meta-analysis of attachment representations in 226 couples, van IJzendoorn and Bakermans-Kranenburg (in press) found that secure women and secure men marry each other more often than chance would indicate, as do insecure men and insecure women. Furthermore, we would like to suggest that parents may implicitly model to each other their caregiving behavior. On a more explicit level, parents may discuss their child and co-construct corrected, joint representations of her or his particular strengths and weaknesses and how to take these into account in their child-rearing behaviors.

However, focusing on results of their meta-analysis of studies of quality of attachment to both parents that indicated that cross-parent symmetry of attachment classifications is not completely random, Fox et al. (1991) suggested that attachment theorists may have prematurely jettisoned temperament explanations of concordance. Of all these alternatives, studies in a kibbutz setting can at least omit the hypothesis of similarity of attachment representations between caregivers because pairs of caregivers are not selected on the basis of their attachment representations. Furthermore, in the kibbutz context, the temperament hypothesis that is based on genetic relatedness between the child and her or his caregivers is not plausible either.

THE KIBBUTZ STUDY

The Israeli kibbutz is no longer new to sociological and psychological research; its characteristics as a social experiment and as a natural child-rearing laboratory have been discussed by Beit-Hallahmi and Rabin (1977), and the setting has been used in previous studies of attachment (Fox, 1977; Maccoby & Feldman, 1972; Sagi et al., 1985). In all kibbutzim, women return to work approximately three months following the birth of their
child, and all infants are then placed in the kibbutz “infant house.” The size of these infant groups is rather small (with an adult-to-children ratio of \( \frac{1}{3} \)), the level of caregivers’ commitment is relatively high, and the infant house has been described as the most optimal group-care facility in Israel (Sagi & Koren-Karie, 1993).

Over the past few years, changes have occurred in the kibbutzim regarding the division of child-rearing responsibilities between infant houses and family homes, and the majority have now abandoned the traditional communal sleeping arrangement in favor of sleeping in the family home. The primary reason for this change in customs was parents’ dissatisfaction with the previous arrangement. At the moment, only one of 260 kibbutzim continued to adhere to the old custom (for a review, see Aviezer, van IJzendoorn, Sagi, & Schuengel, 1994); however, when the current study was being conducted (during 1988–1989), it was possible to recruit a substantial number of subjects from kibbutzim that had still retained the communal sleeping arrangements. A group of children who slept in their parents’ houses was also recruited; this design permitted us to examine the effects that might be exerted by the two ecological contexts defined by the differing sleeping arrangements.

Previous studies of congruences and concordances in infant-caregiver attachments have relied on a single index of attachment security, typically derived from the Strange Situation. In our study, we additionally used the Attachment Q-Set (AQS; see Vaughn & Waters, 1990; Waters & Deane, 1985) so as to test the substantive hypotheses with multiple measures as well as to determine the extent of association between these two assessments—and hence of their reciprocal validation—within the unique caregiving setting of the kibbutz. In support of the reciprocal validity of the AQS, sorts from trained observers have been found to relate in theoretically predictable ways to Strange Situation attachment classification (Howes & Hamilton, 1992a; Valenzuela & Lara, 1987; Vaughn & Waters, 1990). However, studies of such association that have relied on caregivers as AQS informants are scarce, and van Dam and van IJzendoorn (1988) failed to detect substantial overlap between Q-sort security scores derived from mothers’ descriptions and Strange Situation classifications. In this regard, Teti and McGourty (1994) have recently raised various concerns about the veracity of mothers’ reports. Nevertheless, and despite these concerns, they have shown that mothers who are carefully trained in using the AQS can provide descriptions of their children’s secure-base behavior that moderately correlate with observer-derived security scores. In the current study, the AQS descriptions were provided by the metaplot, and, because metaplot have a wide range of experiences with a large number of infants and substantial training in observational skills, we assumed that their descriptions would tend to be more reliable and valid than those of most parents.
SAMPLE AND DESIGN

Infants

The study involved 108 full-term and developmentally healthy infants aged between 11 and 15 months ($M = 12.6$ months, $SD = 1.24$ months); selection of this age range was dictated by the requirement that it be appropriate for conducting Strange Situation assessments. Thirty-three of the subjects were firstborn, 75 had older siblings, and all came from intact families. In terms of family demographics, each kibbutz is a rural cooperative community with an average population of 400–900 people. Every kibbutz member, man or woman, works for the kibbutz economy; the profits of their work belong to the community, which, in turn, provides all with housing, food, clothing, and health and educational services on an equal basis. It is also a selective community in that acceptance of new members is determined by membership vote. Both its selectivity and its socioeconomic organization make it hard to assess socioeconomic status using the traditional indices, but kibbutz members are generally considered as being middle or upper middle class (Tiger & Shepher, 1975).

Subjects were recruited with the assistance of the Institute of Research on Kibbutz Education. Educational coordinators in each kibbutz were contacted by a letter explaining the research and requesting their cooperation and help in the kibbutz; this was followed by a phone call in which they directed us to the relevant families, whose consent was then obtained by phone.

Of the total sample of infants, 54 (28 female and 26 male) were recruited from kibbutzim with communal sleeping arrangements and 54 (27 of each sex) from those where sleeping arrangements were family based. All these infants were participating in a larger research project (see, e.g., Sagi, van IJzendoorn, Aviezer, Donnell, & Mayseless, 1994); the present report focuses only on data concerning infant-metaplot classifications and AQS security scores.

Metaplot

A total of 79 metaplot participated in the study; on average, the infants with whom they were observed had been in their care for a period of 7.84 months (range = 3–20 months). This duration of care is well in excess of the 3 months that we had set as the criterion for participation, and it indicates very low turnover rates as far as our subjects are concerned. Thus, since infants spend the first 3–4 months with their mothers, these infants had been cared for primarily by their mother and their metaplot during their first year of life. The metaplot mean age was 31.0 years ($SD = 8.20$)
They had an average of 7.8 years of experience (range = 4 months–27 years) and 4.16 years of experience in infant care (range = 3 months–27 years); 65% were married, and 70% had children (number of children: M = 1.8, range = 0–5).

Of these women, 78% had elected to care for the given child on the basis of personal choice rather than assignment by the central administration of the kibbutz, and the women were fairly well satisfied with their work (a mean score of 8.03 on a scale of 10). As regards professional training, 56% had undergone some type of child-care training. Of these, 39% had 1–2 years of professional training in infant care, 6% had a preschool teacher's diploma, and 22% had attended various workshops on infancy issues; the remainder had no formal training in child care.

The Kibbutzim

A total of 37 kibbutzim, located in the northern region of Israel, participated in the study, and, in order to transmit the rationale of the research design adequately, some elaboration of the kibbutz early education system is in order. Infant groups are formed as soon as children are born; in all kibbutzim (whatever their sleeping arrangements), six infants and two caregivers constitute the typical group of an “infant house.” The number of infant houses in a given kibbutz varies from year to year and from one kibbutz to another as a function of annual birthrates; it should be noted, therefore, that there is no correspondence between the number of kibbutzim participating in the study (37) and the number of infant houses (54; for further elaboration, see the subsequent section). Most infant houses consist of two bedrooms designed to accommodate three to four infants each, a kitchenette and a dining room, and a playroom and a yard equipped with a large variety of play materials. Infants have their own cribs, toys, and a shelf for other personal belongings; the arrangement of the infant house is such that it provides each child with sufficient private space as well as room for making contact with peers.

Kibbutz infants are exposed to multiple caregiving very early in their lives, regardless of sleeping arrangement (Lavi, 1990). In their first 3 months of life, kibbutz infants are cared for exclusively by their mothers in the family residence. They are brought to the infant house as soon as their mothers return to work part-time, and during the initial period of their stay in the infant house they are cared for jointly by the mother and the metaplelet. Mothers are almost exclusively in charge of feeding during this period, and they arrange their work schedule accordingly; metaplelet are responsible for the infants between the mothers’ visits. During the second half of the infants' first year, metaplelet gradually assume increasing responsi-
ibility for the children's various needs as the mothers increase their workload. Thus, by their second year, infants come under the full care of the metaplot, who play an increasingly larger role in their socialization with respect to issues such as table manners, sharing, play habits, and knowledge of the environment (Aviezer et al., 1994).

A major ecological difference exists between kibbutzim that adhere to different sleeping arrangements. Under communal sleeping conditions, the child goes to the family's residence in the afternoons and evenings as well as on weekends and holidays; both parents try to be available at these times. However, parents bring their children back to the children's house—which is considered their home—and put them to bed there for the night. During the night, two watchwomen are responsible for all children younger than 12 years; these women, who are assigned on a weekly rotation basis and hence are unfamiliar to the infants, monitor the children's houses from a central location (usually the infant house) by making rounds and via intercoms. Introduction of family-based sleeping arrangements changed the proportion of time that infants spend with their families to a pattern similar to that of nonkibbutz day-care settings: infants are brought to the children's house in the morning and taken home in the late afternoon. The family assumes additional caregiving functions, and the influence of metaplot relative to the family has declined.

Another difference—which had direct consequences in determining our research design—is that, in kibbutzim with family-based sleeping arrangements, the prevailing practice was for infants to remain in the same house with the same group of children and under the care of the same two metaplot until about the age of 3 years; thus, the metaplot's care continued into toddlerhood. In kibbutzim with communal sleeping arrangements, however, the infant typically first entered a house designed for infants only, then moved to a "toddler house" at about the age of 12–15 months—a transition that entailed replacement of at least one of the previous metaplot.

This shift to a new caretaker—which occurred within the age range that we had designated for our assessment—precluded studying the concordance of a child's attachment to two different caretakers because one of them would not have cared for the child for the minimum of 3 months required by our criteria; the alternative of conducting Strange Situation assessments with both metaplot before the transition would have violated the requirement of a minimum of 2 months having elapsed between the two occasions, and delaying the assessment until the child had accrued 3 months of experience with the new metapelet would have exceeded the appropriate age limit for this observation. Consequently, assessment of concordances in quality of attachment to two different caregivers was limited to the sample drawn from kibbutzim with family-based sleeping arrangements.
Preserving the distinction between communal and family-based living arrangements in our analyses required the designation of six subgroups; the design is illustrated in Figure 1 and elaborated in what follows.

a) Sample drawn from communally sleeping kibbutzim.—In each of the 27 infant houses of these kibbutzim, two children (selected randomly from the group of six infants) were observed with the same metapelet. These two relationships, designated by \([c]\) \(C_1\)-M \((N = 27)\) and \([c]\) \(C_2\)-M \((N = 27)\), permit us (i) to index the effect of the communal sleeping arrangements on two different children’s relationships to the same caretaker across 27 different caretakers and (ii) to examine the extent to which a caretaker potentiates the same attachment pattern in different children (the congruence hypothesis).

b) Sample drawn from family-sleeping kibbutzim.—In this sample of 27 infant houses, two randomly selected children were tested in two sessions, once with each of their two metaplot (with an intervening interval of 3 months). These four relationships, designated \([f]\) \(C_1\)-M\(_1\) \((N = 27)\) and \([f]\) \(C_2\)-M\(_1\) \((N = 27)\) for those observed in the first session and \([f]\) \(C_1\)-M\(_2\) \((N = 25)\) and \([f]\) \(C_2\)-M\(_2\) \((N = 25)\)\(^1\) for those seen in the second one, permit us (i)

\(^1\) Two pairs of children were not tested with the second metapelet.
to index the effect of family-based sleeping arrangements; (ii) to examine the extent to which two different children are similarly attached to the same caregiver across a total of 27 different caregivers and the extent to which the same children (50 of 54) are similarly attached to the other of their caregivers across a total of 25 different caregivers (the congruence hypothesis), and, finally, (iii) to examine the extent of concordance in the quality of children's attachments to two different caregivers (the concordance hypothesis). In terms of inter-subgroup dependencies, the same metaplot are represented in both groups of children (C₁ and C₂) at each session; while different metaplot are represented at the two sessions, the groups of C₁ and C₂ children remain the same (for pictorial elaboration, see Fig. 1).

Ignoring the distinction between communal and family-based sleeping arrangements (i.e., [c] vs. [f]) permits combining selected subgroups into two larger subsamples that contain no overlapping members, and we do so in some of the analyses to be presented.

PROCEDURES AND MEASURES

The unique nature of the design (and especially the study of the relationships between the metapelet and two different children in each infant house) made it impossible to bring our subjects to the laboratory. Instead, all assessments took place on site in rooms similar to the setting specified by Ainsworth et al. (1978). Camera operators filmed unobtrusively from outside the room through a crack in the curtains; all observations were conducted during the morning hours.

In communally sleeping kibbutzim, conducting this assessment involved two consecutive observations of the same metapelet with first one, then the second of her charges. Immediately following these observations, the children were returned to the infant house, and the metapelet was given the Q-sort deck by the research assistant. She was then asked to complete a sort for each of the two children with whom she had been observed, describing them on the basis of what had characterized her interactions with each during the preceding week and sorting the cards according to the conventions listed in Appendix A (in this volume). The possibility that the immediately preceding experience of what happened during the Strange Situation might have colored the metapelet’s description of the child must be considered; however, we suggest that, given the unique nature of the Strange Situation and the specificity and range of AQS items, this does not seem likely.

The same procedure was followed in the family-based kibbutzim; in these, however, it was also repeated 2 months later with the second metapelet of the two children.
Both the observation and the scoring of the videotapes followed the guidelines given in Ainsworth et al. (1978), and the infants were classified into one of the three major categories of the Ainsworth system (i.e., secure [B], avoidant [A], or resistant-ambivalent [C]). All tapes were rated independently by two of the authors (Joels and Koren-Karie); the 37 tapes they found difficult to code were additionally rated by two other of the authors (Sagi and van IJzendoorn). The coders were unaware of the type of kibbutz in which the child was housed (i.e., communal or family based) since none had participated in the data collection, and the sequence in which the tapes were coded was determined by the other authors (who were not engaged in the ratings) so as to ensure a lengthy interval between coding dyads containing the same child or the same metaplot. Given that the coding of the 158 tapes extended over more than a year, it is reasonable to assume that the classifications were independent in this regard. The mean interjudge agreement among these coders was 89% and the mean kappa .62.

The Attachment Q-Sort

The 90-item version of the AQS listed in Appendix A was jointly translated by three of the authors (Aviezer, Joels, and Sagi); all three are fluent in both English and Hebrew as well as well versed in attachment theory. Following Brislin's (1980) guidelines, we used a back-translation procedure; difficult items were discussed jointly, and, if necessary, an additional bilingual expert was consulted (A. Z. Guiora, the editor of Language Learning). Security scores were computed via correlations with the criterion sort listed in Appendix A. Note that the criterion is American based; although a criterion sort has recently been developed by Israeli experts (see Posada, Gao, et al., in this volume), it was not available at the time the present study took place. We decided to retain the American criterion sort on the grounds of its established validity (which the Israeli sort would not have had as yet), its comparability to the body of extant studies, and its strong convergence with the Israeli criteria.

RESULTS

Preliminary Analyses

To ensure that any differences between the infant-metaplot relationships of dyads housed in the two different types of kibbutzim (i.e., communal and family based) were not confounded by extraneous factors, all the
variables mentioned in describing the full group of metaplot (see the Sample
and Design section above) as well as infants’ ages were contrasted in a series
of t tests. The single statistically significant difference (p = .02) to emerge
from these analyses indicated that infants in the communal kibbutzim were
slightly older than those in the family-based ones (M = 12.9 and 12.3
months, respectively); this inexplicable difference is so slight that there is
no good reason to assume that it could have any substantive implications.
Since all the characteristics of the metaplot working in the two types of
arrangements showed no significant differences, and since we showed else-
where that the parents in both arrangements also do not differ in terms of
basic characteristics (Sagi et al., 1994), the assumption that any differences
between the two types of kibbutzim follow from the difference in their
ecologies can be properly entertained.

Additionally, the ages of the two members of the pair of children who
were cared for by the same metapelet and the number of months that each
had been in her care were contrasted; none of the t tests yielded any signifi-
cant difference. Thus, findings concerning the congruence and concor-
dance of relationships are not influenced by either the child’s age or his or
her extent of experience with the caretaker. As regards the issue of possible
effects of the child’s sex, we assumed that, given the absence of evidence of
such differences in the parent-child attachment literature as well as their
theoretical inexplicability, undertaking such analyses (particularly with small
samples) could not yield informative results; hence, none were attempted.

Infant-Metapelet Attachment Relationships

Beginning at a descriptive level, we obtained the distribution of A, B,
and C classifications that were assigned to infants in each of the six sub-
groups of relationships and contrasted these (via chi square) to the distribu-
tion obtained for infant-mother dyads in a metasample composed of 21
different American samples (the latter values were taken from van IJzen-
doorn, Goldberg, et al., 1992); these data are displayed in Table 1.

The percentage of secure (B) classifications in the infant-metapelet sub-
groups ranged from 44% to 64% (67% was obtained in the metasample),
and the difference in the distribution of classifications was significant in
four of the six subgroups. The standardized residuals show quite clearly
that secure and avoidant classifications were less frequent and resistant-
ambivalent ones more prevalent in the infant-metapelet subgroups; these
latter represent a considerably larger proportion of insecure relationships
in the kibbutz subgroups than in the metasample. Ignoring the distinction
between communal and family-based kibbutzim and combining subgroups
that do not overlap in membership (i.e., contain different infants and differ-
### Table 1

**Distribution of Strange Situation Classifications Obtained for Infant-Metapelet Relationships as Contrasted with the U.S. Metasample of Infant-Mother Relationships**

<table>
<thead>
<tr>
<th>Relationship</th>
<th>Classification (N)</th>
<th>Standardized Residuals</th>
<th>χ²a</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>B</td>
<td>C</td>
</tr>
<tr>
<td>Metasampleb(N = 1,584) . . . .</td>
<td>325</td>
<td>1,062</td>
<td>197</td>
</tr>
<tr>
<td>[c] C₁ = M* (N = 27) . . . .</td>
<td>4</td>
<td>16</td>
<td>7</td>
</tr>
<tr>
<td>[c] C₂ = M (N = 27) . . . .</td>
<td>1</td>
<td>16</td>
<td>10</td>
</tr>
<tr>
<td>[f] C₁ = M₁* (N = 27) . . . .</td>
<td>2</td>
<td>15</td>
<td>10</td>
</tr>
<tr>
<td>[f] C₂ = M₁ (N = 27) . . . .</td>
<td>5</td>
<td>17</td>
<td>5</td>
</tr>
<tr>
<td>[f] C₁ = M₂ (N = 25) . . . .</td>
<td>2</td>
<td>11</td>
<td>12</td>
</tr>
<tr>
<td>[f] C₂ = M₂ (N = 25) . . . .</td>
<td>3</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td>Subsample I (N = 79) . . . .</td>
<td>9</td>
<td>42</td>
<td>28</td>
</tr>
<tr>
<td>Subsample II (N = 79) . . . .</td>
<td>8</td>
<td>44</td>
<td>27</td>
</tr>
</tbody>
</table>

**Note.**—The designation of infant-metapelet relationship subgroups is given in the Sample and Design section; subgroups marked by an asterisk are combined in Subsample I and those unmarked in Subsample II (see the text). Percentages are given in parentheses.

* All significant at p < .001.

b The metasample is derived from Van IJzendoorn, Goldberg, Kroonenberg, & Frenkel (1992).

Ent metašplot) into two larger subsamples shows this effect most clearly: of the around 45% insecure classifications obtained in each of these groups, around 35% were categorized as C; in the metasample, by contrast, only 33% of the relationships were classified as insecure, and only 12% of the metasample cases were classified as C (Subsample I results from combining the subgroups marked by an asterisk in Table 1 and Subsample II from those that are not so marked). These results extend previously reported findings (Sagi et al., 1994) concerning the relatively high prevalence of ambivalent classifications among samples of Israeli mothers to metašplot samples as well.

**Convergence between Strange Situation Classifications and AQS Security Scores**

The mean and range of AQS-derived security scores of children classified as secure (B) as opposed to insecure (A or C) in each subgroup are
displayed in Table 2; since the AQS methodology was designed to permit assessing attachment security as a continuous variable but has not as yet been used to establish different patterns of insecure behavior, the two insecure Strange Situation categories were combined for this analysis. Although only one of the six subgroup contrasts shown in Table 2 achieved statistical significance, the increased power of the test gained in combining these into the two larger subsamples indicates that AQS security scores predictably discriminate between secure and insecure subjects as assessed by the Strange Situation procedure. However, because the convergence between Strange Situation and AQS assessments is a theoretically important issue, it should be noted that the AQS failed to discriminate between avoidant and secure subjects: the mean values of the AQS security scores for the avoidant, secure, and ambivalent infants were, respectively, .25 (SD = .21), .24 (SD = .22), and .13 (SD = .21) for Subsample I and .23 (SD = .11), .27 (SD = .18), and .16 (SD = .21) for Subsample II. It is thus evident that the association between the AQS and the Strange Situation indices of security in this sample is due mainly to the behavior of the ambivalent infants.

Congruence in the Attachment Relationships of Two Children with the Same Metap胎let

Strange Situation classification.—The classifications assigned to each pair of children observed with the same metaplet were examined. Instances in which the same classification (be it secure or insecure) characterized both members of the pair were deemed “congruent,” those in which classifications differed “incongruent.” The relative frequency of congruent and in-

<table>
<thead>
<tr>
<th>TABLE 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>MEAN AQS SCORES OF INFANTS ASSIGNED A SECURE (B) VERSUS AN INSECURE (A or C) CLASSIFICATION IN THE STRANGE SITUATION FOR EACH SUBGROUP</td>
</tr>
<tr>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>Relationships</td>
</tr>
<tr>
<td>M</td>
</tr>
<tr>
<td>[c] C\textsubscript{1} = M*</td>
</tr>
<tr>
<td>[c] C\textsubscript{2} = M</td>
</tr>
<tr>
<td>[f] C\textsubscript{1} = M\textsubscript{1}</td>
</tr>
<tr>
<td>[f] C\textsubscript{2} = M\textsubscript{1}</td>
</tr>
<tr>
<td>[f] C\textsubscript{1} = M\textsubscript{2}</td>
</tr>
<tr>
<td>[f] C\textsubscript{2} = M\textsubscript{2}</td>
</tr>
<tr>
<td>Subsample I</td>
</tr>
<tr>
<td>Subsample II</td>
</tr>
</tbody>
</table>

Note.—The designation of infant-metaplet relationship subgroups is given in the Sample and Design section; subgroups marked by an asterisk are combined in Subsample I and those unmarked in Subsample II (see the text).

^a One tailed.
congruent instances is shown in Table 3, with the total of 54 child pairs divided into those living in the communal kibbutzim (27 pairs) and those observed in the first (27 pairs) and in the second (25 of the latter 27 pairs) session of the family-based kibbutzim assessments; these three subsamples can be viewed as providing replication as well as reflecting an ecological context.

The relative prevalence of congruent over incongruent relationships was higher in both family-based subsamples (70% and 68%). In the communal group, however, their relative prevalence was about the same (48%).

AQS security scores.—The correlation between the security scores of the two children sorted by the same metapelet were $r = -0.31$ (N.S.) in the communal subsample and $r = 0.53$ and $0.38$ ($p = 0.01$ for both) in the two family-based subsamples.

Thus, results obtained with both measures converge to indicate that the hypothesis of congruence tends to hold in the family-based setting but not in the communal, pointing to the importance of context in determining its prevalence.

**Concordance in Attachment Relationships That a Child Establishes with Two Different Metapelet**

As we noted in describing the research design, the structure of the communal kibbutzim precluded conducting this facet of the assessments, which were consequently restricted to children housed in the family-based kibbutzim. To establish a degree of replication, the results are presented separately for the subsamples of children we had designated $C_1$ and $C_2$ as well as for the combined sample of 50. (Note that the total here is not 52

<table>
<thead>
<tr>
<th>TABLE 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Congruence in Strange Situation Classifications of Two Children with the Same Metapelet</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Subsamples</th>
<th>Strange Situation Classification ($N$)</th>
<th>Congruent</th>
<th>Incongruent</th>
<th>$\chi^2$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communal</td>
<td></td>
<td>13</td>
<td>14</td>
<td>.04</td>
<td>N.S.</td>
</tr>
<tr>
<td>(48)</td>
<td></td>
<td>(48)</td>
<td>(52)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family based (first session)</td>
<td></td>
<td>19</td>
<td>8</td>
<td>4.48</td>
<td>03</td>
</tr>
<tr>
<td>(70)</td>
<td></td>
<td>(70)</td>
<td>(30)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family based (second session)</td>
<td></td>
<td>17</td>
<td>8</td>
<td>3.24</td>
<td>07</td>
</tr>
<tr>
<td>(68)</td>
<td></td>
<td>(68)</td>
<td>(32)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note.—Percentages are given in parentheses*
### TABLE 4
CONCORDANCE BETWEEN STRANGE SITUATION CLASSIFICATIONS OF THE SAME CHILD WITH TWO DIFFERENT METAPELET

<table>
<thead>
<tr>
<th>Metapelet 1</th>
<th>Metapelet 2 (N)</th>
<th>Standardized Residuals</th>
<th>χ²</th>
<th>p*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Child 1 subsample (N = 25)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>0 1 1</td>
<td>-2 1 0</td>
<td>3.03</td>
<td>NS</td>
</tr>
<tr>
<td>B</td>
<td>2 7 5</td>
<td>9 8 17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>0 3 6</td>
<td>-7 10 17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Child 2 subsample (N = 25)</td>
<td></td>
<td></td>
<td>14.8</td>
<td>.006</td>
</tr>
<tr>
<td>A</td>
<td>2 0 3</td>
<td>14 -22 8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>1 11 4</td>
<td>-9 40 -30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>0 0 4</td>
<td>-5 18 22</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total sample (N = 50)</td>
<td></td>
<td></td>
<td>12.72</td>
<td>.01</td>
</tr>
<tr>
<td>A</td>
<td>2 1 4</td>
<td>13 -21 8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>3 18 9</td>
<td>0 48 -48</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>0 3 10</td>
<td>-13 -27 40</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note — Percentages are given in parentheses
* Exact Fisher tests

[27 M₁ + 25 M₂] because there were two M₂'s missing for establishing the correspondence between M₁ and M₂.

Strange Situation classification.—The joint distribution of classifications of the child with each metapelet is shown in Table 4. Assessed (via chi square) for deviation from chance expectations, the degree of concordance fails to reach statistical significance in the C₁ subsample, but the concordance seen in the C₂ subsample as well as in the combined total group does attain significance (p < .006 and .01, respectively); examination of the standardized residuals indicates that similarly secure and resistant-ambivalent classifications are the prime contributors to this concordance.

AQS security scores.—Security scores derived from the sorts of the two caregivers of C₁ children correlated r = .29 (N.S.), and those from the sorts of C₂ children correlated r = .53 (p < .001); for the two subsamples combined, r = .39 (p < .01). Thus, the pattern of findings—significant concordance in the sample as a whole, with one of the two subsamples showing it to a far stronger degree than the other—was replicated by these data as well.
DISCUSSION

We began this work by assuming—as we have argued before (van IJzendoorn, Sagi, & Lambermon, 1992)—that infants form attachment relationships with their nonfamilial caregivers. In the present case, the rearing conditions of the infants we studied provide strong justification for the validity of that assumption. On the basis of the information that we reported regarding rearing conditions, it is evident that these infants entered into their metaplot's care at an age when their physical survival and psychological comfort depend almost exclusively on the caregiving adult and that for most of them both the metapelet and the infant house remained a major “constant presence” ever since. Moreover, the data show that most metaplot freely chose to care for their charges and that most expressed satisfaction with their role, suggesting that these caregivers had an emotional investment in the children they were rearing. Taken together, these history-related characteristics represent the set of theoretical hallmarks of circumstances in which relationships governed by the attachment system are formed. However, a relevant cautionary note here is that, since we do not know anything about either the relative salience of these defining characteristics or their minima, the argument must remain restricted to this setting.

Some other caveats regarding the nature of infant–nonfamilial caregiver relationships should also be mentioned. Consistent with Sagi et al. (1985), attachments between infants and metaplot were more likely to be insecure compared to what characterized the metasample of U.S. mother-infant relationships (van IJzendoorn, Goldberg, et al., 1992) as well as the sample of Israeli mother-infant dyads (Sagi et al., 1985). It should be noted, however, that, when the distributions of attachments to kibbutz metaplot are compared with those of attachments to professional caregivers in other countries (Goossens & van IJzendoorn, 1990; Howes et al., 1992), the proportions of secure and insecure attachments are quite similar. What factors may underlie this relative overrepresentation of insecure dyads is not clear. One explanation may lie in the nonfamilial caregiving situation itself: the number of infants who need the caregiver's attention simultaneously may affect the latter's ability to respond promptly, which makes it more difficult to form secure attachments. Alternatively, more subtle differences may exist in the organization of attachment behaviors that characterize the mother and the caregiver relationships and hence require that the Strange Situation coding criteria be adjusted accordingly.

We raise this latter possibility because, compared with our findings regarding mothers of kibbutz infants, which showed the presence of very few insecure-avoidant relationships (Sagi et al., 1985; Sagi et al., 1994), some infants were classified as avoidant in each of the six subsamples we examined, albeit the incidence of such was less than that of insecure-
ambivalent relationships (an average 11% and 35%, respectively). While avoidant relationships have been repeatedly reported to be seen and consistently interpreted as insecure (Ainsworth et al., 1978; Main & Weston, 1982), it would be problematic if what passes for “avoidance” in a Strange Situation observation conducted with the professional caregiver is in some cases truly “disinterest” in an adult who is not really an attachment figure for the infant. Current assessment systems for security of attachment presume an attachment relationship to exist and do not explicitly permit the coder to identify an infant as not attached. In our data, some of the infant-metaplot dyads showed signs of flatness in expression of affect that could be indicative of the absence of a specific bond. This is a topic that clearly requires further study.

The nature and specificity of infant-adult attachment relationships is a major issue in attachment theory and research (e.g., Bretherton, 1985), and it was addressed in the present study by examining the congruence hypothesis. Our Strange Situation data replicated and extended previous findings (Sagi et al., 1985) in showing congruence in the attachment relationships of two different infants with the same metaplot. Not only do these data corroborate findings that have been reported in studies of siblings (Teti & Ablard, 1989) and of twins (Goldberg et al., 1986; Minde et al., 1990), but they also uniquely support the role of interactional histories in determining specific infant-adult attachment relationships—any possible genetic influences were well controlled here since the infants were not biologically related either to the metaplot or to each other.

Note, however, that this congruence in two infants’ relationships to their common caregiver was found to characterize only relationships developed in kibbutzim with family-based sleeping arrangements. Although the overall quality of daytime care was similar in both sleeping settings (Sagi et al., 1994), finding that such congruence is far less prevalent in kibbutzim with communal sleeping conditions raises the intriguing and heretofore unexplored possibility that the identity of the person who is there to comfort the infant during the night can have significant effects not only on the quality of the child’s relationship with the daytime caretaker but also on the coherence of such relationships across different infants in the same infant house. It appears that the congruence hypothesis is less likely to be sustained in the unusual ecological context of having an unfamiliar individual take on the nighttime role.

Evidence for the congruence hypothesis appears in the AQS data as well. Although one might argue that such congruence could be expected as a result of having the same metaplot provide the AQS profiles for the two children, note that congruence is supported by the Q-sort data only in those settings where congruence in Strange Situation classification is also observed (i.e., family-based sleeping arrangements). We view this result as
indicative of convergence across measures and thus as providing multimeasure support to the congruence hypothesis.

It should also be noted that, whereas studies of siblings (Teti & Ablard, 1989; Ward et al., 1988) and twins (Minde et al., 1990; Szajnberg et al., 1989; Vandell et al., 1988) have reported levels of congruence ranging between 30% and 60%, the level obtained in the present study was about 70%. This is a more impressive figure, and, owing to our unique design, any explanation of this high degree of congruence concluded in genetic terms can be ruled out. However, the finding that about 30% of the relationships were incongruent also should not be overlooked. Finding instances of lack of congruence is not surprising given recent meta-analytic data (van IJzendoorn, 1995) showing that, although there is widespread support for the hypothesis of intergenerational transmission of attachment (a hypothesis that depends on the same assumptions concerning the operations of internal working models as does the congruence hypothesis), there is also evidence of instances where such transmission of attachment patterns does not take place.

Concerning the concordance between the attachment relationships that two different nonparental attachment figures construct with the same child, we expected to find these to be unique to each dyad. However, this has proved not to be the case in this study. Some concordance between relationships that the two metaplot developed with the same child was replicated across subsamples as well as measures, particularly in the case of secure and resistant/ambivalent relationships.

We contend that two caregivers who cooperate jointly in raising the same child tend to model caregiving behaviors for each other as well as explicitly co-construct similar representations as the child, hence potentiating the same qualities of attachment relationship in the children in their charge. Recall that most metaplot had been trained in principles of "good" child rearing and that most were personally motivated to do their jobs as best they could; within the homelike context of the kibbutz infant house, these factors may promote the similarity of caregiving behaviors and hence concordance in relationships. In any event, we propose that the likelihood of similarity of attachment representations in both caregivers can be eliminated here—first, the assignment of metaplot to infant houses does not follow the psychological processes that characterize the selection of a spouse, and, second, it can be safely assumed that the attachment representations of the two metaplot were acquired independently of and prior to their assignment to a given infant house. However, the design of the study does not allow the exclusion of the temperament hypothesis proposed by Fox et al. (1991), according to which characteristics of the child elicit similar responses from different caregivers.

The issue of the reciprocal validity that is afforded by convergence
between Strange Situation and AQS data can be summarized by addressing two types of findings. First, in testing the central hypotheses of this study—namely, the congruence and the concordance hypotheses—similar results were obtained with each of the two measures: security scores based on the AQS appeared to support or falsify hypotheses derived from attachment theory in a way similar to that in which scores based on Strange Situation classifications do. The Strange Situation procedure indexes the operations of the attachment system under stress and focuses mainly on reunion behavior; the AQS indexes its operations under “normal” conditions and assesses the balance between age-appropriate proximity seeking and exploration (i.e., the secure-base phenomenon). Thus, the convergence of results between these two different indices provides further evidence, in a cross-cultural context, for the validity of the AQS (for additional evidence of such convergence, see Vaughn & Waters, 1990).

The second line of evidence derives from the finding that AQS scores predictably discriminated between subjects classified as secure and insecure in the Strange Situation. This form of reciprocal validation is consistent with findings reported by Bosso, Corter, and Abramovitch (1995) and Teti and McGourty (1994), which were based on mothers’ reports, but is inconsistent with Dutch data reported by van Dam and van IJzendoorn (1988), which were based on mothers’ sorts of an earlier version of the AQS. In the case of metaplot, a variety of factors that we mentioned before may have promoted their observation and reporting skills. However, this positive view of the sensitivity of the Q sorts provided by metaplot must be tempered by the recognition that they tended not to discriminate between infants classified as avoidant and those classified as secure on the basis of the Strange Situation. We are hesitant to attach any strong interpretation to this finding because of the small number of cases that it involves; however, should it be replicated in other samples, it will deserve further careful consideration (see also van Dam & van IJzendoorn, 1988). Be that as it may, the degree to which security versus insecurity of attachment is replicated by the AQS and by the Strange Situation data clearly supports claiming reciprocal validity for both instruments.

CONCLUDING REMARKS

The findings of our study converge with the growing body of evidence indicating that infants form attachment relationships with their nonfamilial caretakers; concurrently, however, they also highlight the necessity of thinking carefully both about the conditions under which the relationship has developed and about the assumptions that are built into our current methods of assessment before this evidence is generalized to other samples.
The theoretical gains entailed by studying the relations among attachment relationships are also highlighted in the results that we have reported. The design of the study allowed us to examine the theoretically central assumption that the working model of attachment constructed by the adult on the basis of past and present attachment experiences acts as a template for subsequent caregiving behavior. Expressed in terms of our congruence hypothesis, the data supported this assumption—and finding that it was less likely to operate under the communal sleeping conditions opens up theoretically intriguing questions concerning the effects that differences in ecology may exert on the development of attachment relationships and their interrelations.

Finding that infants tend to form attachment bonds of similar quality with two different nonfamilial caregivers (our concordance hypothesis) contributes a new source of evidence to the body of work on relations among relationships (Hinde & Stevenson-Hinde, 1988), and it also permits some restriction of hypotheses concerning the mechanism that may underlie the phenomenon. In all, moving from the study of particular attachment relationships to a focus on the network of such relationships within which infants develop and construct their working models emerges as essential in both examining currently held assumptions and permitting further extensions of attachment theory.