

## Sleeping Out of Home in a Kibbutz Communal Arrangement: It Makes a Difference for Infant-Mother Attachment

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SAGI, ABRAHAM, VAN IJZENDOORN, MARINUS H. AVIEZER, ORA DONNELL, FRANK and MAYSELESS OFRA *Sleeping Out of Home in a Kibbutz Communal Arrangement: It Makes a Difference for Infant-Mother Attachment* CHILD DEVELOPMENT, 1994, 65, 992-1004 Attachment classification distributions of infant-mother dyads living in 2 types of Israeli kibbutzim were compared. The subjects were 48 infants, 14-22 months old ( $M = 18.29$  months). 13 boys and 10 girls were from 23 kibbutz infants' houses with communal sleeping arrangements and 13 boys and 12 girls were from 25 kibbutz infants' houses with home-based sleeping arrangements. The 2 groups did not differ on infants' temperament and early life events, mother-infant play interaction, quality of infants' daytime environment, or any of several maternal variables. Among the home-based infants, 80% were securely attached to their mothers versus 48% of the infants in communal sleeping arrangements. No avoidant relationships were found. Including the disorganized/disoriented attachment classification (44% in the communal group, 32% in the home-based group) did not change the results. We argue that the communal sleeping arrangement presents a child-rearing environment that deviates markedly from the environment of evolutionary adaptedness.

Bowlby (1984, p. 60) emphasized the importance of observing the development of children raised within settings that deviate considerably from the so-called environment of evolutionary adaptedness. In our first study on the development of attachment in infants raised in Israeli kibbutzim (Sagi

et al., 1985), we examined the security of infant-mother attachment when infants were being raised in a traditional kibbutz communal sleeping arrangement. Infants in this setting are exposed to child-rearing practices that differ markedly from those that attachment theorists consider desirable, and con-

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posed to communal. These two conditions were naturally occurring kibbutz child-rearing practices that could not be randomly assigned. Accordingly, a quasi-experimental design (Cook & Campbell, 1979) was adopted with the aim of demonstrating the similarity of the groups across crucial background information and potentially contaminating variables.

Mothers' biographical characteristics, including age, number of children, education, professional training, and kibbutz experiences as a child, were considered background data. The data concerning potentially intervening variables consisted of appraisals of mothers' current job satisfaction, anxiety about separation from their infants, and attitudes toward their infants' houses, as well as observations of mother-infant interaction during a play session. Infants' background information and possible intervening variables included infants' age, sex, perceived temperament, and critical early life events such as illness and separation from parents. Another crucial comparison concerned the quality of care observed in each infants' house so we could examine the essential similarities in the daytime ecology of both groups of infants.

### Subjects

The subjects were 48 full-term, developmentally healthy infants aged 14 to 22 months ( $M = 18.29$ ,  $SD = 2.25$ ) from intact families. Thirteen boys and 10 girls were drawn randomly from 23 different kibbutz infants' houses with communal sleeping arrangements, and 13 boys and 12 girls were drawn randomly from 25 kibbutz infants' houses with home-based sleeping arrangements. An infants' house normally consists of six infants and two caregivers. The number of existing infants' houses in a given kibbutz depends on the annual birth rate, which changes from year to year and from one kibbutz to another (average is about 8–15 infants per year). We approached 50 kibbutz infants' houses through the official channels of the Institute of Research on Kibbutz Education, which monitors all research activities conducted with kibbutz children. One family had to leave the country unexpectedly after we obtained consent but before we visited, and one family withdrew its consent. Because this study is part of a larger project, we were unable to replace these two families. For communal versus home-based infants, mean ages were 18.74 ( $SD = 2.03$ ) and 17.88 ( $SD = 2.40$ ), respectively. There was no significant association between the type

of sleeping arrangement and the sex of the infants.

We were well aware that many kibbutzim were in the midst of an internal negotiation process regarding the sleeping arrangements for their children. Therefore, only kibbutzim in which the communal sleeping arrangement had been conservatively observed were contacted. In these kibbutzim, all of the infants and children slept in the infants' and children's houses prior to and at the time of our observations, and the membership assembly had not voted yet for a change in the communal sleeping arrangement. The kibbutzim sampled in this study voted to change the communal sleeping arrangement anywhere between 8 months and 2 years after our observations ended, for many, the delay was primarily caused by lack of sufficient resources to expand the size of each family's living space. In fact, sociohistorical observation of the emergence and adoption of "familism" (Tiger & Shepherd, 1975) suggests that the transition of any specific kibbutz from a communal to a home-based sleeping arrangement does not stem from its members being more "child-oriented" than members of kibbutzim adhering to a communal sleeping arrangement. In this respect, self-selection is not inherent in the sociohistorical development of the two groups.

### Measures

*Mother Characteristics Questionnaire*—This questionnaire consisted of items asking each mother about her age, education, profession, present occupation, and background in child care, as well as how she joined the kibbutz and the age and number of her children. In addition, each mother was asked whether she chose or was assigned her present occupation. This question was followed by three 10-point Likert-type items that gauged work satisfaction. The first item, which referred only to mothers who had been assigned to their present job, asked how each felt when they commenced working. In the second item, all mothers were queried about their current feelings at work. For both questions, a score of 1 indicated disappointment and a score of 10 indicated that she felt very satisfied. The last question tapped the extent to which each mother would like to act on her current feelings about her job. A score of 1 meant that she would prefer to quit her present position, and a score of 10 meant she would rather stay.

*Life Events Questionnaire*—This questionnaire aimed at tapping events in each infant's life that revolved around possible trauma and separation from parents. The events investigated were chronic and acute illnesses, hospitalization, and separation from mother and father. Items included questions regarding the frequency of each event, its length in time, and the infant's age at time of occurrence. Two separate scores were calculated for each of these event domains: *frequency* of occurrence, which is the number of times an event took place since the time of the infant's birth, and *duration* of occurrence, which is the total number of days. Thus, for example, a child being hospitalized once for 2 days and once for 6 days scores 2 on frequency of occurrence and 8 on duration.

*Infant Characteristics Questionnaire (ICQ)*—The ICQ (Bates, Freeland, & Lounsbury, 1979) is composed of 32 seven-point items translated into Hebrew utilizing the guidelines set down by Brislin's (1980) back-translation procedure. Bates et al. (1979) described the scale as consisting of factors for fussiness-difficultness, unadaptability, persistence, and unsociability. In the present study, alpha reliabilities for these factors were .79, .48, .57, and .22, respectively. Thus, only the fussiness-difficultness subscale was used in subsequent analyses. A lower score represents an easier temperament and a higher score a more difficult temperament.

*Maternal Separation Anxiety Scale (MSAS)*—Hock and associates (Hock, 1984; Hock & Clinger, 1981; Hock, DeMeis, & McBride, 1988) defined the variable of "maternal separation anxiety" for short-term separations as "an unpleasant emotional state reflecting a mother's apprehension about leaving her child" (Hock, 1984, p. 194). The MSAS consists of 35 five-point, self-report, Likert-scale items comprising three subscales: maternal separation anxiety, perception of separation effects of the child, and employment-related separation concerns (Hock, McBride, & Gnezda, 1989). The items of the MSAS were translated into Hebrew, once again employing the guidelines set down by Brislin's (1980) back-translation procedure.

The Maternal Separation Anxiety Subscale (MSA) consists of 21 items that reflect the mother's expressions of anxiety and feelings of guilt when separated from her infant, the Perception of Separation Effects on the

Child Subscale is composed of seven items relating to the mother's attitudes and feelings about her infant's reaction to separation, and the Employment-Related Separation Concerns Subscale contains seven items that assess the mother's attitude about balancing her maternal role and work. Alpha reliabilities for the three subscales were .78, .55, and .25, respectively. Thus, only the MSA scale, which is the most basic and reliable one (Hock et al., 1989), was used in further analyses.

*Nursing Child Assessment Teaching Scales (NCATS)*—The NCATS (Barnard et al., 1989) consists of observations during a "teaching" session, the goal of which is to observe the interaction patterns that occur between the mother and her child. The mother was asked to teach her child a playful task that the child developmentally could not succeed at quite readily. These tasks were chosen from the Bayley Scales of Infant Development (Bayley, 1969), and they were designed to be too difficult for the child to handle unless some assistance was provided by the mother. Observations lasted for about 10 min, prior to the administration of the Strange Situation. All observations were videotaped.

Raters scored these observations using six scales. For parents, the important behaviors were *sensitivity to infant's cues* (11 items), ability to *alleviate the infant's distress* (11 items), and ability to mediate the environment for the child in ways that *foster cognitive development* (17 items) and *social-emotional development* (11 items). For infants, the primary behaviors were the ability to *produce clear cues* for the mother (10 items) and the ability to *respond to the mother* (13 items). Using the standard definitions for the NCATS, the observers were asked to decide whether each of the 73 items did or did not take place at least once (score of 1 for yes, score of 0 for no). Because very few infants showed distress, the scale for ability to alleviate the infant's distress did not have enough variance to be included in statistical analyses. Scores for each of the five remaining scales were summed to establish total scores. Interrater reliabilities were obtained by Pearson correlations computed for the scores of the five scales, generated by two independent raters on 15 cases (mean  $r = .93$ ).

*Appraisal of Infants' Houses Scale*—A 13-item, self-report, five-point, Likert-type attitude scale, developed especially for this

study, asked the mother to reflect upon her appraisal of the infants' house where her infant lived. The mother was asked to indicate the extent to which the infants' house fulfilled her infant's needs and to indicate her attitudes toward the metapelet, her infant's peer group, and the infants' house itself. A high score indicated a positive attitude. The alpha reliability of this scale was .75.

*Infant-Toddler Center Spot Observation System (ITCSOS)*—Belsky and Walker (1980) developed this observation system to assess quality of caregiver interaction with infants in day-care centers. In previous studies, the measure showed high short-term stability (Lamb et al., 1988).

Caregiver behavior was rated over a 3-min period, utilizing a checklist of events consisting of 13 positive and 7 negative items. This is a binary coding system, where observers noted any events occurring at least once within each 3-min episode. Thus, the score for positive items ranged between 0 and 13, and the score for negative items between 0 and 7.

Positive events comprised caregiver behavior with reference to positive regard, empathy, verbal elaboration, heightened emotional display, transforming routine into a learning experience, concurrent routine maintenance and infant engagement, non-structured attention focusing, facilitating peer interaction, dual child engagement, on floor involvement, and distant involvement, as well as the infant's behavioral display of happiness, and, finally, whether some of the activities of the infants' house featured non-toy play or exploration. Negative items were child crying, child uninvolved or behaving aimlessly, caregiver prohibitions, child restrictive device, children waiting, routine as routine, and caregiver nonchild conversation.

Six 3-min periods were observed during each visit. These periods included parts of the "love hour" (Aviezer et al., 1989), mealtime, playtime, and caregiving/putting to bed. Out of a total of 5,760 observations, 800 were observed independently by a second observer. Interobserver reliability was 95%. The ITCSOS was scored by summing across all of the six positive scores for each infants' house observed and across all of the six negative scores for each infants' house observed, thus generating two total composite scores.

*Strange Situation procedure*—Infant-

mother attachment is usually observed in the well-known Strange Situation procedure (Ainsworth et al., 1978), in which infant-mother interaction during a series of increasingly stressful episodes indicates the quality of their attachment relationship. Infant's behavior during reunion with the mother after two 3-min separations is classified into three main categories of attachment. Infants classified as securely attached (B) show minimal resistant and avoidant behavior, that is, a securely attached infant is somewhat upset when the mother leaves but her return has a calming effect. Infants classified as avoidant (A) do not seek proximity or contact with the mother when she returns, but instead show avoidant behavior. Infants classified as resistant or ambivalent (C) seek contact but at the same time resist the mother when she returns, some resistant infants are unable to settle within the 3-min reunion episode.

In the past, each infant-mother dyad has typically been "forced" into a best-fitting A, B, or C attachment classification when the infant did not completely fit within the criteria set by the original classification system (Ainsworth et al., 1978). Recently, Main and Solomon (1990) have suggested a fourth classification—disorganized/disoriented—for such infants. Disorganized (D) infants show a momentary absence of any particular strategy for dealing with the separation stress and with the return of the mother, they show inconsistent behavior patterns, such as avoidant as well as resistant behavior or the odd behaviors detailed by Main and Solomon (1990). Because the D category has not been validated as thoroughly as the original classifications, both ABC and ABCD outcomes are presented.

The Strange Situation procedure was conducted on site in a manner similar to that reported in Sagi et al. (1985). Strange Situation tapes were rated independently by three of the authors (Mayseless, Sagi, & van IJzendoorn), who were blind to the infant's sleeping arrangement status. With regards to the ABC system, mean interjudge reliability was 82% (mean kappa = .63). Bearing in mind that the ABCD system is rather new and not yet widely used, it should be noted that van IJzendoorn reached 83% (kappa = .76,  $N = 30$ ) reliability agreement in a training session with Mary Main and Sagi reached 86% (kappa = .72,  $N = 22$ ) reliability agreement for another kibbutz subsample after a training session with van IJzendoorn. In the present study, the ABCD system was

applied through consensus between Sagi and van IJzendoorn

## Results

### *Analyses of Similarities between the Two Sleeping Arrangements*

We compared critical background factors and potentially contaminating variables across the two groups—mothers and infants with communal sleeping arrangements versus mothers and infants with home-based sleeping arrangements

To compare the continuous measures for the communal versus home-based infants, a series of MANOVAs and ANOVAs were computed. The results obtained from the multivariate and univariate analyses are summarized in Table 1. These analyses revealed significant effects only for the mean frequency and duration of mother-infant separations, the mean scores were greater for home-based infants. Chi-square analyses of the categorical background variables of infant health, mothers' origin, and job satisfaction were also run. As Table 2 shows, none of these were found to be significant.

In all, the background characteristics of the communal and the home-based groups were very similar, which accords with our hypothesis that the groups were from essentially the same population of infants and mothers, with equivalent levels of daily care in the infants' houses thus substantiating the quasi-experimental design approach. Furthermore, the observations of these mothers with their infants in a play session did not show any difference between the two groups.

Only in one aspect did the two groups differ, in that mothers of home-based infants were more likely to leave their infants and for a greater duration than were mothers of infants with communal sleeping arrangements. To address the issue that Strange Situation classifications may be associated with frequency and duration of separation experiences—an issue hotly debated in the day-care literature (e.g., Belsky & Braungart, 1991)—we conducted Kruskal-Wallis one-way ANOVAs with separation measures as dependent variables and the ABC classifications as the independent variable. A nonparametric approach was necessary because of the skewness of the separation measures. Mean rank of separation duration for the insecure group was 20.97, and 26.44 for the secure group,  $\chi^2(N = 48) = 1.81, p = .18$ . Mean rank of the separation frequency was

22.29 for the insecure group and 25.71 for the secure group,  $\chi^2(N = 48) = .75, p = .39$ . No significant relations were found for the analyses within each group either.

### *Strange Situation Classifications*

The main attachment classification findings are presented in Table 3, utilizing both the traditional ABC criteria (set out by Ainsworth et al., 1978) and the recently developed ABCD classification system (Main & Solomon, 1990). No sex differences were found. Also, no avoidant classifications were made for insecure infants in either group, and the majority of the infants in the communal group were found to be insecure-ambivalently attached to their mothers. Compared to earlier studies using the ABCD system in normal populations (Main & Solomon, 1990; van IJzendoorn, Goldberg, Koonenbeig, & Fienkel, 1992), a substantial number of infants in each of the sleeping arrangement groups were classified as disorganized/disoriented. Furthermore, in both the ABC and ABCD classification systems, a significant association exists between the attachment classification and the sleeping arrangement of the infant. Infants raised in the communal arrangement were found to be more insecure-ambivalently attached to their mothers than infants raised in the home-based arrangement. The adjusted standardized residuals for the ABCD analysis showed that inclusion of the disorganized/disoriented category did not change this result.

Because the only difference between mothers of home-based infants and mothers of communal infants was that the former were more likely to leave their infants and for a greater duration, we tested whether separation experience might have contaminated the relation between attachment and sleeping arrangement. Separation experience was dichotomized (no separation,  $n = 20$ , one or more separations,  $n = 28$ ) to allow for log-linear analyses. The dichotomized separation variable still showed significantly more separation experiences in the home-based group,  $\chi^2(N = 48) = 1.81, df = 1) = 4.01, p = .04$ . In the saturated model, the three-way interaction sleep  $\times$  classification  $\times$  separation was not significant (estimate for parameter =  $-1.5, z = -.96, N.S.$ ), indicating that the relation between sleeping arrangement and attachment classification was not dependent on separation experience. The best fitting hierarchical (backward selection procedure) model contained two-way interactions: sleep  $\times$  classification and

TABLE 1

SUMMARY OF STATISTICS FOR THE INTERVAL BACKGROUND OR POTENTIALLY INTERVENING VARIABLES

	COMMUNAL (N = 23)		HOME-BASED (N = 25)		F	df
	M	SD	M	SD		
Mother variables						
Number of children in the family	2.39	2.33	2.08	1.35	<1.00	1,46
Age (years)	32.74	4.72	30.40	4.18	3.31	1,46
Education (years)	13.96	1.43	13.40	1.55	1.66	1,46
Job satisfaction					<1.00	3,9
How felt if job assigned	4.86	2.12	5.17	2.40	<1.00	1,11
Present job satisfaction	7.36	2.30	7.54	2.34	<1.00	1,45
Desire to change job	6.05	3.51	6.80	3.61	<1.00	1,45
Maternal Separation Anxiety Subscale	18.97	2.70	19.47	3.22	<1.00	1,46
Appraisal of infants' house	45.26	5.76	48.00	6.26	<1.00	1,46
NCATS <sup>a</sup>					<u>1.06</u>	<u>3.43</u>
Sensitivity to cues	9.52	1.04	9.79	.66	1.14	1,45
Socioemotional fostering	9.61	.84	9.54	.93	<1.00	1,45
Cognitive fostering	15.91	.95	15.54	1.72	<1.00	1,45
Infant variables						
Age (months)	18.74	2.02	17.88	2.40	1.78	1,46
ICQ—fussy	1.34	.30	1.35	.29	<1.00	1,46
Hospitalization					<1.00	<u>2.45</u>
Mean frequency	.57	.84	.36	.64	<1.00	1,46
Mean duration (days)	2.57	4.93	1.44	2.67	<1.00	1,46
Acute illness					<1.00	<u>2.45</u>
Mean frequency	1.91	1.62	1.84	1.35	<1.00	1,46
Mean duration (days)	12.57	13.09	11.12	11.66	<1.00	1,46
Separation from mother <sup>*</sup>					<u>3.26</u>	<u>2.45</u>
Mean frequency	.52	.67	1.23	1.34	6.00	1,46
Mean duration (days)	1.74	3.29	4.48	5.38	4.44	1,46
Separation from father					<u>1.25</u>	<u>2.45</u>
Mean frequency	1.91	1.73	2.40	1.41	1.15	1,46
Mean duration (days) <sup>b</sup>	38.39	46.52	39.40	31.86	<1.00	1,46
NCATS <sup>a</sup>					<u>1.25</u>	<u>2.45</u>
Clarity of cues	8.96	.88	8.75	1.26	<1.00	1,45
Responsiveness to mother	8.61	1.56	8.83	1.71	<1.00	1,45
Quality of group care						
ITCOS					<1.00	<u>2.45</u>
Positive	25.39	7.51	27.40	5.49	NA	
Negative	11.09	2.64	11.16	3.10	NA	

NOTE.—Underscored numbers are multivariate results. NA = not applicable.

<sup>a</sup> Home-based group, N = 24.<sup>b</sup> The numbers are rather high because of mandatory annual military service for all Israeli men below the age of

54. Under certain circumstances, it may reach 70–80 days per year. The average service is about 30 days per year.

<sup>\*</sup> p < .05.

sleep  $\times$  separation ( $G^2 = 86$ ,  $df = 2$ ,  $p = 65$ ), which again shows that the communal and home-based groups differ independently with respect to attachment and to separation.

To test more specifically the alternative hypothesis that the sleeping arrangement determines the amount of separation experience and that separation experience determines the attachment classification (e.g., children who are more used to separation may be less anxious in the Strange Situation),

we compared two log-linear models. The first model contained 2 two-way interactions: sleep  $\times$  separation (modeling the causal link from sleeping arrangement to separation experience) and separation  $\times$  classification (modeling the causal link between separation experience and attachment). The fit of this model ( $G^2 = 6.08$ ,  $df = 2$ ,  $p = 0.48$ ) was compared to the fit of the model in which sleeping arrangement was indirectly as well as directly related to attachment classification. This second model contained the two two-way interactions of the

TABLE 2  
SUMMARY OF STATISTICS NATIONAL BACKGROUND VARIABLES

	Communal	Home Based	$\chi^2$	df
Number of chronically ill infants				
Chronically ill	1	3		
No chronic illness	22	22	<1	1
Number of infants after acute illness				
Acutely ill	18	17		
No acute illness	5	8	<1	1
Present maternal job satisfaction				
Job is by choice	16	19		
Job is by assignment	7	6	<1	1
Maternal background				
Kibbutz born	8	9		
City born in Israel	8	9		
Not born in Israel	7	7	<1	2

NOTE.—None of the  $p$  values reached significance

TABLE 3  
STRANGE SITUATION CLASSIFICATION DISTRIBUTIONS OF INFANT MOTHER RELATIONSHIPS

	COMMUNAL ( $N = 23$ )		HOME BASED ( $N = 25$ )		TOTAL ( $N = 48$ )	
	$N$	%	$N$	%	$N$	%
ABC <sup>a</sup>						
Insecure avoidant	0	(0)	0	(0)	0	(0)
Secure	11	(48)	20	(80)	31	(65)
Insecure ambivalent <sup>b</sup>	12	(52)	5	(20)	17	(35)
ABCD <sup>c</sup>						
Insecure avoidant	0	(0)	0	(0)	0	(0)
Secure	6*	(26)	15*	(60)	21	(44)
Insecure ambivalent <sup>b</sup>	7*	(30)	2*	(8)	9	(19)
Disorganized	10	(44)	8	(32)	18	(37)

<sup>a</sup> Classification according to the Ainsworth et al (1978) coding system including forced classifications (Main & Solomon 1990)  $\chi^2(1) = 5.42$   $p = .02$

<sup>b</sup> One infant was assessed as insecure albeit unclassifiable according to the ABC system. This result was treated as insecure in the analyses.

<sup>c</sup> Classification according to the Main and Solomon (1990) coding system  $\chi^2(2) = 6.79$   $p = .03$

\* Significant adjusted standardized residuals  $p < .05$

first model supplemented with the sleep  $\times$  classification interaction (to model the direct causal link between sleeping arrangement and attachment classification). The fit of the second model ( $G^2 = 84$ ,  $df = 1$ ,  $p = .36$ ) was much better than the fit of the first, indicating that the alternative hypothesis is implausible. Sleeping arrangement has a direct effect of attachment classification independent of separation experiences.

## Discussion

The quasi-experimental design employed in the present study enabled a com-

parison of the effects of two different patterns of sleeping arrangements in the kibbutz, communal versus home-based. More than half of the infants in communal sleeping arrangements developed insecure attachment relationships with their mothers. Only a fifth of home based infants were found to be insecure. Other than the frequency and duration of infant-mother separations, all background characteristics of the two groups of mothers and infants were essentially the same. The quality of daily care in the infants' houses was also revealed to be equivalent across the two groups, demonstrating the hypothesis that apart from sleep-

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ing arrangements the two groups were equal. Lastly, the groups did not differ on quality of mother-infant interaction in a play session, suggesting that lack of contact at night time for the communal group did not secondarily change the interactions these mothers had with their infants during the day.

Although potential threats to internal validity are inherent in any quasi-experimental design (Cook & Campbell, 1979), we demonstrated the equivalence of the groups with respect to any important and salient variables. Therefore, this study strongly suggests that participating in a communal sleeping arrangement increases the incidence of insecure-ambivalent infant-mother attachment. This confirms the principal hypothesis. The new cohort therefore replicates earlier findings that child-rearing practices in kibbutzim with communal sleeping arrangements may indeed be associated with the development of insecure attachment (Sagi et al., 1985).

Every week infants in a communal sleeping arrangement encounter different watchwomen whose task is to look after their basic needs. Clearly, such an arrangement does not allow infants to develop attachment relationships to the watchwomen, who, in turn, cannot serve as a secure base for the infants whenever the infants wake up and require attention. Given that the infants in the communal group cried on average about 10 times per week (Donnell, 1991), these infants indeed experienced distress at night. Moreover, it is likely that any intervention by unfamiliar watchwomen in response to distress would elicit stranger anxiety in the infant (Bronson, 1986; Spitz, 1965; Tennes & Lample, 1964), which would further exacerbate the infant's distress. From the point of view of attachment theory, the continuous inaccessibility—without adequate replacement—of the mothers as primary attachment figures at night, combined with the mothers being available and responsive during the day, may constitute for the infants an inconsistently responsive interaction pattern. This caretaking situation is likely to promote insecure-ambivalent relationships between mothers and their infants (Ainsworth et al., 1978), as was the case in more than half of the sample. It should be noted that because these infants experience inconsistency between the nature of interactions during the day and the nature of interactions during the night, their experience might be considered as different from the experience of infants

with a parent who is continuously available physically and yet behaves inconsistently toward the infant.

The absence of differences between the two groups in the play session, which supports the internal validity of this study's quasi-experimental design, may also seem puzzling in view of attachment theory's claim that the nature of attachment will be demonstrated in infants' daily interactions with their caregivers. While this deserves further consideration, we propose that although the basic temporal structure of maternal inconsistency might be different for infants in the communal group, the qualitative meaning of the inconsistency as appraised by the infant is not necessarily different. In other words, the infant still experiences extremely inconsistent responses from the mother, who is available during the day, but absent during the late evening, the entire night, and early morning, when a consoling attachment figure may be needed. In a stressful situation like the Strange Situation, the infant shows the effects of this inconsistent responsiveness; this does not mean, however, that the mother's state of mind with regard to attachment is insecure, and therefore that all her behaviors toward the child must reflect her own insecurities. The infant and his or her mother may be perfectly happy playing with each other under nonstressful circumstances, because the mother does not necessarily lack the ability to be responsive. To measure the disharmony in their relationship, infants and their mothers must be observed in somewhat stressful contexts, in which attachment and sensitivity are really being tested (Smith & Pederson, 1988). Our play situation did not induce that kind of stress. Therefore, we hypothesize that the infants' anomalous experience in the communal sleeping ecology overrides the contribution of the secure personalities of many mothers. Intergenerational transmission of attachment is, we suggest, imbedded in, and in extreme cases limited to, the social context in which infant-mother dyads interact (van IJzendoorn, 1992). Obviously, further research should provide more data on the interaction between the role of the social context and the role of the mother's state of mind with respect to attachment.

It may seem surprising that the communal sleeping arrangement should alter attachment security so profoundly, whereas the long separations accompanying illness and hospitalization do not (van IJzendoorn



et al., 1992) We suggest, however, that because the nightly separation in the communal sleeping arrangement occurs as an integral part of the child-care environment and is normative for all the children in the community even sensitive parents may not think it necessary either to compensate for their absence during the night or to communicate the exceptional nature of the experience to the children (Lewin, 1990) On the other hand, parents of hospitalized infants may consider the nightly separations as unusual and perceive this regime to be stressful for the child, under these circumstances, parents often try to compensate for the child's hospital experiences, and often will sleep in the child's hospital room at night when possible Because hospitalization is temporary, periods of intensive interaction at home may be effective in preventing the development of insecure attachment

Mothers of home based infants left them for longer and more frequent periods (e.g., for a short holidays without the child) than mothers of communal infants We considered the number and duration of separations as potential intervening variables, because more separations of a longer duration may be associated with higher rates of attachment insecurity Specifically, we were concerned that mothers of infants participating in a communal sleeping arrangement might be inclined to separate from their infants for longer periods than the mothers with infants in home-based sleeping arrangement, because they might perceive such separations as less disruptive of their infants' daily routine, and therefore less stressful for the infants, than mothers of home-based infants In fact, the results show the opposite pattern, suggesting that mothers who regularly care for their infants at night feel more comfortable in occasionally separating from them than mothers who do not This is not to imply that infants who sleep at home are more exposed to strangers when their mothers are absent for more than 24 hours In such cases infants are likely to be under the care of a familiar person (e.g., father, grandparents, or family friends) in the privacy of the family home (Gerson, 1978) The alternative hypothesis that more frequent and lengthy separations cause infants to feel more at ease in the Strange Situation and therefore display more secure behavior has not been confirmed, because no relation was found between separation experiences and Strange Situation classifications Our log-linear analyses showed in fact, that the in-

teraction effect between sleeping arrangement and Strange Situation classification is independent of the interaction between sleeping arrangement and separation experiences

Obviously, the results of the present study are dependent on the validity of the Strange Situation procedure as a measure for assessing attachment security in the context of a kibbutz In support of this contention, Sagi, Lamb and Gardner (1986) found convergent validity between Strange Situation behavior and stranger sociability among kibbutz reared infants Oppenheim, Sagi, and Lamb (1988) also discovered that attachment status associated with the metapelet was predictive of later socioemotional development The suitability of the Strange Situation for infants living in a communal sleeping arrangement was also challenged on grounds that such infants may not be accustomed to being separated from their parents during the time that they are together This possibility seems to be unlikely in light of previous data (Sagi et al., 1985) showing that Strange Situation classifications were unaffected by timing of assessment Finally, recent meta analyses demonstrate that, after years of debate regarding the validity of the Strange Situation in a cross-cultural context, use of the procedure in various cultural contexts can be considered cross-culturally valid (Sagi, 1990; Sagi, van IJzendoorn & Koren-Kaie, 1991; van IJzendoorn, 1990; van IJzendoorn & Kloonenberg, 1988)

Special attention should be given to the finding that the entire insecure group, in both the communal and home-based settings, consisted of ambivalently attached infants This is congruent with the findings reported earlier (Sagi et al., 1985), although the older cohort contained a few avoidantly attached infants In a comparison of the distributions of ABC classification data from infants in the communal setting, the home-based setting, and Israeli urban day-care centers, Donnell (1991) has shown that the various groups of insecure infants living within an Israeli ecology—whether kibbutz or town—were more likely to develop insecure ambivalent relationships with the mother than to develop avoidant relationships Since data all pointing in the same direction have accumulated, this suggests that some factors unique to Israeli society and yet unexplored may cause the overrepresentation of ambivalent attachment

As noted, we have also applied to our

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observations the recently developed ABCD attachment classification system, but the disorganized/disoriented category did not change the difference between the communal and the home-based groups. In fact, in both groups, the incidence of the disorganized/disoriented attachment relationship seemed to be rather high (44% communal, 32% home-based), given that these infants come from a normal rather than a clinical population (van IJzendoorn et al., 1992). Because of the overrepresentation of ambivalent attachment relationships within the insecure groups, these infants may be considered as more vulnerable to becoming disorganized/disoriented. Furthermore, the wide range of stressful experiences and hardships that many Israeli families experience or have experienced might be consistent with experiences that are theoretically related to disorganized/disoriented behaviors (Main & Hess, 1990). At the present, however, it is premature to go beyond just noting this intriguing finding.

Although this study focuses on the possible implications for attachment development of participating in an extreme out-of-home environment, that is, in a communal sleeping arrangement, it should be noted that both groups participate in another type of out-of-home care, namely, infant day-care. Kibbutz infants, regardless of whether they are in communal or home-based sleeping arrangements, spend about 9 hours per day, 6 days a week in the infants' house. Belsky (1988) described the developmental risks to which children are exposed when remaining for long periods in a day-care setting during the early years of life. Even kibbutz infants in a home-based sleeping arrangement seem to fall into this category, since they are placed in day-care facilities as early as their third or fourth month of life and remain there more than 40 hours per week. Since the home-based group setting in fact involves extensive day-care, we may conclude that when good quality care is offered (which is the case in the kibbutz, see Sagü & Koren-Karie, in press), negative effects on attachment security are absent. This is not in contradiction with the conclusions of Belsky (1988), who was primarily concerned with nonoptimal day-care facilities (J. Belsky, personal communication, April 1991).

Whereas direct experimental manipulations are impossible if one wishes to study the effects of extremely unusual environments on the development of attachment in humans, the present study was based on an

"experiment by nature" (Bronfenbrenner, 1979). We were able to compare kibbutz infants participating in a unique communal sleeping arrangement with their home-based counterparts who were similar in many relevant aspects. Our major finding supports the notion that being reared in an environment that significantly deviates from the environment of evolutionary adaptedness (Bowlby, 1984) indeed has adverse effects on the quality of infant-mother attachment relationships. At the same time, it remains intriguing that 26% of our communally raised infants appeared to be securely attached to their mothers. This suggests that the negative effects of a communal sleeping arrangement account for only part of the variance. What protective factors were responsible for the development of secure attachments despite the shortcomings of the communal sleeping arrangement remains to be investigated.

## References

- Ainsworth, M. D. S., Blehar, M. C., Waters, E., & Wall, S. (1978). *Patterns of attachment*. Hillsdale, NJ: Erlbaum.
- Aviezer, O., Sagü, A., Donnell, F., Harel, Y., Joels, T., & Tuvia, M. (1989, April). *Mother-infant interaction observed during 'love hour' in kibbutz infants' houses and the development of infant-mother attachment*. Paper presented at the biennial meeting of the Society for Research in Child Development, Kansas City, MO.
- Barnard, K. E., Hammond, M. A., Booth, C. L., Bee, H. L., Mitchell, S. K., & Spieker, S. J. (1989). *Measurement and meaning of parent-child interaction*. In F. Morrison & J. Lord (Eds.), *Applied psychology* (Vol. 3, pp. 39-80). New York: Academic Press.
- Bates, J. E., Freeland, C., & Lounsbury, M. (1979). *Measurement of infant difficulty*. *Child Development*, 50, 794-803.
- Bayley, N. (1969). *Bayley Scales of Infant Development*. New York: Psychological Corp.
- Belsky, J. (1988). The "effects" of infant daycare reconsidered. *Early Childhood Research Quarterly*, 3, 235-272.
- Belsky, J., & Braungart, J. M. (1991). Are insecure-avoidant infants with extensive daycare experiences less stressed by and more independent in the Strange Situation? *Child Development*, 62, 567-571.
- Belsky, J., & Walker, A. (1980). *Infant-Toddler Center Spot Observation System*. Unpublished manuscript, Pennsylvania State University, University Park.
- Bowlby, J. (1973). *Attachment and loss: Vol. 2: Separation*. London: Penguin.

- Bowlby, J (1984) *Attachment and loss Vol 1. Attachment* (2d ed) London: Pelican
- Brislin, R W (1980) Translation and content analysis of oral and written material. In H C Triandis & R W Brislin (Eds), *Handbook of cross-cultural psychology/social psychology* (Vol 2, pp 389-444) Boston: Allyn & Bacon
- Bionfenbrenner, U (1979) *The ecology of human development: Experiments by nature and design*. Cambridge, MA: Harvard University Press
- Bronson, G W (1968) The development of fear in man and other animals. *Child Development*, 39, 409-432
- Cook, T D, & Campbell, D T (1979) *Quasi-experimentation: Design and analysis issues of field settings*. Chicago: Rand McNally
- Donnell, F (1991) *The impact of family-based versus communal sleeping arrangements on the attachment relationships of kibbutz infants*. Unpublished master's thesis, School of Social Work, University of Haifa, Israel
- Gerson, M (1978) *Family, women, and socialization in the kibbutz*. Lexington, MA: Lexington Books/Heath
- Hock, E (1984) The transition to daycare: Effects of maternal separation anxiety on infant adjustment. In R Ainslie (Ed), *Quality variation in daycare: Implications for child development* (pp 183-205). New York: Praeger
- Hock, E, & Clinger, J B (1981) Infant coping behaviors: Their assessment and their relation to maternal attributes. *Journal of Genetic Psychology*, 138, 231-243
- Hock, E, DeMeis, D K, & McBride, S L (1988) Maternal separation anxiety: Its role in the balance of employment and motherhood in mothers of infants. In A Gottfried & A Gottfried (Eds), *Maternal employment and children's development: Longitudinal research* (pp 191-227). New York: Plenum
- Hock, E, McBride, S L, & Gnezda, M T (1989) Maternal separation anxiety: Mother-infant separation from the maternal perspective. *Child Development*, 60, 793-802
- Lamb, M E, Hwang, C, Bookstein, F L, Broberg, A, Hult, G, & Frodi, M (1988) Determinants of competence in Swedish preschoolers. *Developmental Psychology*, 24, 58-70
- Lavi, Z (1982, April) *Correlates of sleeping arrangements of infants in kibbutzim*. Paper presented at the International Conference of Infant Studies, New York
- Lewin, G (1990) Motherhood in the kibbutz. In Z Lavi (Ed), *Kibbutz members study: kibbutz children* (pp 34-39). New York: Greenwood
- Main, M, & Hess, E (1990) The parents of insecure-disorganized/disoriented infants: Observations and speculations. In M T Greenberg, D Cicchetti, & E M Cummings (Eds), *Attachment in the preschool years: Theory, research and intervention* (pp 161-184). Chicago: University of Chicago Press
- Main, M, & Solomon, J (1990) Procedures for identifying infants as disorganized/disoriented during the Ainsworth Strange Situation. In M T Greenberg, D Cicchetti, & E M Cummings (Eds), *Attachment in the preschool years: Theory, research and intervention* (pp 121-160). Chicago: University of Chicago Press
- Oppenheim, D, Sagi, A, & Lamb, M L (1988) Infant-adult attachments and their relation to socioemotional development four years later. *Developmental Psychology*, 24, 427-433
- Sagi, A (1990) Attachment theory and research from a cross-cultural perspective. *Human Development*, 33, 10-22
- Sagi, A, & Koren-Karie, N (in press) Day-care centers in Israel: An overview. In M Cochran (Ed), *International handbook of day-care policies and programs*. New York: Greenwood
- Sagi, A, Lamb, M E, & Gardner, W (1986) Relationships between Strange Situation behavior and stranger sociability among infants on Israeli kibbutzim. *Infant Behavior and Development*, 9, 271-282
- Sagi, A, Lamb, M E, Lewkowicz, K, Shoham, R, Dvir, R, & Estes, E (1985) Security of infant-mother, -father, and -metapelet attachments among kibbutz-reared Israeli children. In I Bretherton & E Waters (Eds), *Growing points in attachment theory and research* (pp 257-275). *Monographs of the Society for Research in Child Development*, 50(1-2, Serial No 209)
- Sagi, A, van IJzendoorn, M H, & Koren-Karie, N (1991) Primary appraisal of the Strange Situation: A cross-cultural analysis of the pre-separation episodes. *Developmental Psychology*, 27, 587-596
- Smith, P B, & Pederson, D R (1988) Maternal sensitivity and patterns of infant-mother attachment. *Child Development*, 59, 1097-1101
- Spitz, R A (1965) *The first year of life: A psychoanalytic study of deviant object relations*. New York: International Universities Press
- Tennes, K H, & Lample, E E (1964) Stranger and separation anxiety in infancy. *Journal of Nervous and Mental Disease*, 139, 247-254
- Tiger, L, & Shepherd, J (1975) *Women in the kibbutz*. New York: Harcourt Brace Jovanovich
- van IJzendoorn, M H (1990) Developments in cross-cultural research on attachment: Some methodological notes. *Human Development*, 33, 23-30

## 1004 Child Development

- van IJzendoorn, M. H. (1992). Intergenerational transmission of parenting: A review of studies in nonclinical populations. *Developmental Review, 12*, 76-99.
- van IJzendoorn, M. H., Goldberg, S., Kroonenberg, P. M., & Frenkel, O. J. (1992). The relative effects of maternal and child problems on the quality of attachment: A meta-analysis of attachment in clinical samples. *Child Development, 63*, 840-858.
- van IJzendoorn, M. H., & Kroonenberg, P. M. (1988). Cross-cultural patterns of attachment: A meta-analysis of the Strange Situation. *Child Development, 59*, 147-156.

sequently we expected to find an unusually high rate of insecure attachments among such infants. Employing the Strange Situation procedure (Ainsworth, Blehar, Waters, & Wall, 1978), we found that infants raised in this ecology were indeed classified as insecure-ambivalent to a greater extent than in most other cross-cultural samples (Sagi, 1990, van IJzendoorn & Koonenbeig, 1988).

In the ecology of a traditional kibbutz with communal sleeping arrangements, infants are moved into the infants' house at 6 weeks of age. These infants are cared for in small groups by professional caretakers while their mothers visit regularly to feed and bathe them throughout the first year. During the night, two watchwomen are responsible for all the children under the age of 12 years on the kibbutz. The watchwomen are regular members of the kibbutz who contribute 1 week about every 6 months on a rotation basis, and they are responsible for monitoring via intercom a number of the children's houses from a central location, usually the infants' houses. Thus, at night the adults available to the infants (a total of about 50 women) are often unfamiliar and unable to respond promptly. Of necessity, then, infants are never able to establish a durable bond with the adults available to them at night.

Two major characteristics of this ecology may account for the overrepresentation of insecure-ambivalent attachment in kibbutz infants. First, as already mentioned, there is likely to be substantial delay as well as inconsistent responsiveness to distress at night, when infants are monitored by various unfamiliar watchwomen. Second, infants are continuously being exposed to inconsistent maternal caretaking. That is, while mothers are quite available during the day, they become inaccessible at night. The mothers, therefore, cannot be considered rejecting of the attachment behaviors of their infants—which would lead to insecure-avoidant attachment—but their infants necessarily experience inconsistent responsiveness to their attachment signals, which has been described as a precursor to insecure-ambivalent attachment (Ainsworth et al., 1978, Bowlby, 1973, 1984).

The present study was designed not only to replicate the initial exploratory study but also to examine our previous explanations. We have suggested that the critical factor in the overrepresentation of ambivalent attachments in the earlier study is the

communal sleeping arrangement and its concomitants. The earlier study included only infants residing in kibbutzim with communal sleeping arrangements, but without an adequate comparison group, our explanations regarding the antecedents of the overrepresentation of ambivalent attachments remained speculative. In the present study, we include a group of kibbutz infants raised with home-based sleeping arrangements. In both communal and home-based settings, infants spend about 9 hours each day (6 working days) in the care of *metaplot* who are the infants' primary caregivers (Hebrew: *metapelet*, pl. *metaplot*). All infants spent the hours of 4–8 P.M. at home with their parents. Infants residing in kibbutzim with home-based sleeping arrangements remained with their families for the night, whereas infants residing in kibbutzim with communal sleeping arrangements were returned to the infants' houses at about 8 P.M. by their parents to be settled for the night and remained under the care of watchwomen until morning.

Including a comparison group from home-based kibbutzim allowed us to focus on the differential effects of two kinds of sleeping arrangements while also controlling for potential intervening factors. Our principal hypothesis is that more kibbutz infants raised within a communal setting will be insecurely attached to their mothers than infants raised within a home-based setting. To minimize the possibility of alternative explanations, it was crucial to test the hypothesis that the home-based and communal groups of mothers and infants were similar in regard to a number of background and potentially intervening variables. Indeed, we hypothesized that, apart from infant sleeping arrangements, all mothers and infants were drawn from the same population. It was further hypothesized that the quality of care in the infants' houses during the daytime was the same across the two groups of infants. Thus, if differences were found between the attachment distributions of two groups, then this difference may be explained as an outcome of the difference between the home-based and communal sleeping arrangements.

## Method

### Procedure

The aim of the research design presented here was to compare two groups of infants who differed only in terms of their sleeping arrangements: home-based as op-