

# Attachment, Caregiving, and Sleep: The Tie that Keeps Infants and Mothers Awake

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Sleep is a biological function that is partially regulated by the ecological context of the familial relationships. Yet, only a few empirical studies examined sleep from a relational standpoint. Furthermore, while sleep-wake transitions are likely to involve the attachment and the caregiving systems, data pertaining to this interplay are scarce. Thus, the goal of the present study was to focus on attachment-related constructs and address settling and night waking difficulties. Sixty-eight Kibbutz mothers of healthy infants, aged 9-15 months, completed sleep questionnaires and responded to self-report measures pertaining to adult attachment and to maternal feelings. The prevalence of insecurity among this group of mothers was 54%. Overall, the mothers reported high pleasure in interacting with their child. Mothers' anxiety in close adult relationships correlated with hostility towards the infant. Sleep problems were common; 46% of the infants were perceived as having a sleep problem. While mothers' attachment characteristics were not related to the child's sleep, the emotional tie to the infant was linked to sleep regulation. Specifically, pleasure in the interaction was associated with more sleep problems and more involved nighttime parenting. In conclusion, around one year of age, sleep-related difficulties are common and appear to be characteristic of infants whose mothers express a positive emotional tie towards them. Given that both the sleep data and the relationship assessment were based on maternal reports, it remains a task for future studies to include longitudinal observations that illuminate how emotional ties impact sleep regulation. Due to sampling and assessment limitations, more studies across different ages and contexts are warranted. **(Sleep and Hypnosis 2003;5(1):40-50)**

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## INTRODUCTION

Bowlby's attachment theory (1) has had an immense impact on the way scientists and clinicians understand the mother-child relationship and its role in development.

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Although the involvement of the attachment system in the development of sleep-wake regulation has not been directly studied by Bowlby, his theory provides a unique window for conceptualizing sleep from a relational perspective. Moreover, the recent elaboration on the caregiving system (2,3), which provides an extension of attachment principles to the caregiving relationships, provides another avenue for construing sleep regulation within the dyadic tie. As it is beyond the scope of this

report to review attachment theory, suffice is to highlight a number of constructs and principles that seem particularly relevant for the study of infants' sleep.

As pointed out by Anders (4), falling asleep each night is a separation and waking up is a reunion. Separation and reunion experiences are central to attachment theory and research. Moreover, since going to bed and waking at night often involve heightened anxiety, for both the child and the parent, sleep triggers the attachment system. The activation of the attachment system is closely linked to fear. In a recent overview of attachment theory (5), "natural clues to danger"-stimuli that are not inherently dangerous but that increase the likelihood of danger-are pointed out. These stimuli include darkness and aloneness (6). Accordingly, at night, the attachment system is bound to be activated, and attachment behaviors, which target proximity to a protective caregiver, such as crying, are common. A deactivation of the attachment system is expected in the comforting nighttime presence of the attachment figure. Hence, the repeated nighttime activation and deactivation of the attachment system are likely to impact the emergence of the attachment bond. From a developmental perspective, by the end of the first year, infants have learnt to anticipate the reaction of the caregiver to their daytime and nighttime stress signals. At this stage, known as the consolidation of attachment, or phase 3 (1), the infant's emotional tie to the mother is specific and enduring-in other words, the infant, is "attached". For attachment researchers identifying whether this emotional tie is "secure" or "insecure" (7), and examining maternal variables that predict these patterns (8) have been a major challenge.

In an attempt to clarify the origins of the attachment figure's sensitivity to the child's needs, George and Solomon (3) proposed an approach that links attachment and caregiving. This approach provides a useful conceptual framework for a further evaluation of mother-

child sleep-related dynamics. Drawing on Bowlby's premise that the behavior of the attachment figure is organized by a caregiving behavioral system (1,9), George and Solomon (3) highlight the significance of making a shift from being protected (the goal of the child) to providing protection (the goal of the parent). The biological function of the caregiving system is to provide protection, thus when the parent perceives a situation as frightening, dangerous, or stressful for the child, action follows. When separated from the infant (e.g., at night), sensitivity to signals of discomfort and distress is particularly heightened, thus parental behavior which aims to ensure protection and comfort, such as retrieval and maintaining physical proximity, are common practices. George and Solomon (3) maintain that the caregiving system should be deactivated by proximity (e.g., co-sleeping), and once the child appears content, the caregiver experiences pleasure and satisfaction.

Given that the architecture of infants' sleep involves a number of awakenings across the night (10), that, at least in part, are likely to involve the parent (4), how the dyad negotiates the sleep-wake transition could be shaped by the activation of the attachment and caregiving systems as well as embedded in a more generalized template of family dynamics. In line with this premise, the present study was set to address sleep-wake regulation, from the maternal perspective, around the end of the first year, when sleep problems are common (11), the infant-mother attachment tie has been already formed (1), and separation anxiety is at a peak (12).

To date, only a few studies empirically investigated sleep from attachment theory standpoint. In a clinical case study with a sleep disturbed child (13), Moore has argued that insecure attachment seriously interfered with the child's sleep. In a study with 94 12-month-old infants from the general population, Scher (14) did not find that the sleep of insecure infants was more interrupted than the sleep of

anxious-ambivalent infants. Settling to sleep was, however, linked to attachment. Bedtime difficulties were particularly marked for the dependently-secure infants. Clearly, more studies which examine child's security of attachment and sleep-related phenomena are needed. The focus of the present study, however, is on attachment from the maternal perspective. Benoit et al (15), who studied 20 mothers of sleep disturbed toddlers and controls, found a strong link between maternal insecurity and sleep disturbance. In fact, all the mothers of the sleep disturbed group were insecurely attached to their own parents, as measured by the Adult Attachment Interview-AAI (16). Following that study, the primary objective of our study was to address the link between mothers' attachment characteristics and their child's sleep, but, to examine a non-referred group. Unlike Benoit et al. (15), we chose to focus on mothers' attachment relationships with their spouse, or partner, rather than on the mental representations of mothers' attachment to their own parents.

The importance of the marital context to mothers' capacity to parent has been highlighted by the parenting process model (17). Similarly, George and Solomon, in an overview of the caregiving perspective (3), also point out the contribution of the marital relationship. Internal working models in spousal or partnership relationship have been studied by Hazan and Shaver (18), who designed a tool that consists of brief descriptions of adult analogues of the secure, avoidant and ambivalent attachment patterns to which respondents classify themselves. It has been argued that the self-report attachment classification (18) and the AAI (16) are tapping into similar underlying constructs (19). Two such constructs are the bi-polar dimensions of security-anxiety, and closeness-avoidance (20). The first question to be addressed in this study, then, is whether or not infants' sleep characteristics and the associated nighttime parenting are shaped by the characteristics of

mothers' adult close relationships.

Whereas maternal adult attachment may be a distal modulator of sleep-related negotiations, parenting variables more directly shape aspects of the dyadic nighttime interaction, and possibly impact sleep regulation as well. Accordingly, the second focus of the present study was the mother-to-infant relationship. As noted earlier the theoretical construct of the caregiving system (3), is assumed to play a role in sleep regulation since this system is expected to be triggered by the child's attachment behavior. The activation of the child's attachment system at bedtime is manifested by separation protests, and in the course of the night, attachment behavior is expected to take place when an awakening occurs and the child's seeks proximity and comfort (4). For the purpose of the present study, we have defined nighttime caregiving in terms of parental involvement in the child's sleep regulation at bedtime and at night. While caregiving is an important function of parenting (2), parent-child relationships involve other dimensions as well (17,21). An important facet of parenting involves positive emotionality, affection and pleasure (22). To what extent this feature of the emotional tie to the infant accounts for how settling to sleep and night waking are negotiated was also addressed in this study. In line with previous findings that indicated that among low-risk 12-month-olds, positive emotionality in the dyad was associated with more night waking (23), we expected that positive affectional tie would be associated with more nighttime involvement with the child.

Finally, given the impact of social support and socio-demographic variables on parenting (17), the present study aimed to control variability in respect to this factor by studying infants and mothers from a single developmental niche (24). The Israeli Kibbutz is a cooperative and democratically governed small community in which members work for the kibbutz economy and in turn are provided by the community with needs and services

(25). While in the past, collective sleeping arrangement was a characteristic of most Kibbutzim, such practice no longer exists, and all children sleep at home with their parents. Thus, for the purpose of the present study, the kibbutz environment provides a valuable quasi-experimental control over social support network and economical status of mothers and their children and at the same time provides an arena that allows studying individual styles of parenting and examining their association with sleep regulation.

Taken together, the purpose of the present study was twofold. From the attachment perspective, the objective was to examine the link between mother's attachment characteristics and the sleeping pattern of her infant, and to test the prediction that insecurity and sleep problems are associated. Secondly, from the perspectives of caregiving and mother-to-infant tie, the objective was to test the prediction that positive affectional tie will be associated with more reports of nightwaking and more involved nighttime parenting.

## METHOD

### *Subjects*

The sample included 68 mothers and their infants from Kibbutz settings in Israel. The infants (46% boys, 32% first-born), aged 9 to 15 months (Mean=12.2, SD=2.2) were healthy and with no developmental delays. Mothers' age ranged between 21- 46 (Mean=32.5, SD=4.8). All mothers were employed, and while at work, their children were in daycare centers.

### *Measures*

(a) The adult romantic attachment measure (20). This is a self report questionnaire that includes 36 statements regarding the feelings of adults toward significant others in close relationships. The items are divided to two 18-item scales: closeness-avoidance (e.g. "I prefer

not to show others how I feel deep down") and security-anxiety (e.g. "I worry about being abandoned"). Responders mark on a 7- point scale (1=completely untrue for me; 7=very true for me) the extent to which the description reflects their personal feelings. Internal consistency (n=1086) was .94 and .91, respectively for the avoidance and anxiety scales (.88 and .86, respectively, in the present study). Based on the two scales, respondents may be classified into one of the following attachment styles: secure (low scores on both scales); fearful avoidant (high scores on both scales); preoccupied (low avoidant high anxiety); dismissing avoidant (high avoidant low anxiety).

(b) The maternal feeling questionnaire (MFQ), adapted from the "parent-to-infant attachment" questionnaire (26). The "parent-to-infant attachment" questionnaire is a 19-item self-report instrument designed to assess parental affection tie. While evidence for reliability and validity of the tool has been provided (26), the original instrument includes items that are ranked on scales with different categories, ranging from 2 to 5 points, the present format (MFQ) consists of a 4-point Likert scale for all items. In addition, the present Hebrew version excludes 3 of the original items as they seem culturally inappropriate and/or unreliable. Thus the questionnaire used in the present study (MFQ) includes 16 items (e.g., "when I am with the baby I usually try to shorten the time I spend with him/her"), scored 1 to 4, high score indicates positive feelings. A 87% test re-test reliability has been established. A factor analysis produced two scales "hostility" (alpha .67) and "pleasure in interaction" (alpha .72). The pleasure scale was negatively correlated with hostility ( $r=-.26, p<.05$ ).

Sleep measure: Two sleep questionnaires were administered. The first is the Infant Sleep Questionnaire-ISQ (27), which is a maternal self-report tool that consists of 8 items (e.g., how long does it usually take to settle your baby off to sleep on average?; how often do you

end up taking your baby into your bed because he/she is upset and won't sleep). The ISQ yields a sleep problem score ranging from 0 to 38. Based on either Richman's criteria (28), and/or maternal criteria, the infant is classified into a sleep problem and non sleep problem group. For the purpose of the present study, a nightwaking index (number of wakes per week, per night, and duration of awakening) was also extracted. The index is rated, based on the ISQ, from 1 to 4 according to Richman's (28) criteria. In addition, items from the sleep habit questionnaire (29) pertaining to parental bedtime and nighttime soothing techniques were selected. The following data were coded: settling in the presence of the mother or independently, using co-sleeping (at least once a week) as a soothing practice when the child wakes up at night, and the reasons mothers give to explain why nightwaking occurs.

### Procedure

Mothers were recruited to participate in a study on infant sleep through the early education coordinator in each of the 68 participating Kibbutzim. First, a telephone call

questionnaires were completed, but as 4 were excluded since the child was not within the specified age, 68 participants comprised the current sample.

### RESULTS

Table 1 describes mothers' attachment characteristics (avoidance and anxiety in spousal relationships) and their "affectional tie" towards the infant (pleasure and lack of hostility). The distribution of attachment classifications was as follows: 46% secure ( $n=31$ ), 15% fearful-avoidant ( $n=10$ ), 19% preoccupied ( $n=13$ ), and 21% dismissing-avoidant ( $n=14$ ). Overall, 54% of the mothers were classified as insecure. As to the link between attachment and affectional tie, the only significant correlation was between the anxiety scale and the hostility level ( $r=.29$ ;  $p<.05$ ). In addition when dividing the mothers into 4 groups according to a median split of the two emotional tie scales (pleasure and hostility), it was found that high pleasure and low hostility was characteristic of 51% of the secure mothers as opposed to only 19% of the insecure mothers ( $\chi^2=8.93$ ;  $p<.05$ ).

**Table 1. Descriptive statistics for mothers' attachment scales, feelings towards the infant, and the child's sleep characteristics.**

	ATTACHMENT		AFFECTIONAL TIE		SLEEP	
	Avoidance	Anxiety	Absence of hostility	Pleasure in interaction	Sleep problem	Nightwaking Index
Mean	2.83	3.24	3.48	3.31	10.82	1.68
Sd	.94	.98	.40	.50	6.04	.81
Range	1.39- 6.06	1.44 -5.67	2.14 - 4.00	2.00 - 4.00	0 - 25.00	0 -3.33

was made to the early education coordinator, in order to locate potential subjects living in their Kibbutzim (mothers of healthy infants without developmental delays, aged 9-15 month). The coordinators were instructed to ask mothers' permission to give their name to the researcher. Second, a telephone call was made to the 96 mothers, 91 agreed to participate. The questionnaires were sent to those mothers, with a stamped return-envelope; 72 (79%) of the

The means and standard deviations of the sleep measures are presented in Table 1. Based on mothers' perceptions, 46% of the infants ( $n=31$ ) had a sleep problem; using Richman's criteria, 43% of the infants were classified into the sleep problem group. Interestingly, while there was no gender difference in the prevalence of sleep problems as defined by Richman's criteria, according to mothers' perception, more girls had a sleep problem

( $X^2=4.08$ ;  $p<.05$ ). Using both mothers' perception and Richman's criteria, 31% of the infants were classified as having a sleep problem. When comparing the settling routines of infants with and without sleep problems it was found that in the sleep problem group, infants fell asleep in the presence of their mothers more often than in the non-problem group (74% compared to 26%,  $\chi^2=10.33$ ;  $p<.01$ ). In response to the question why do you think your child wakes up at night, 47% attributed nightwaking to physical discomfort (e.g., hungry), 16% to emotional distress (e.g., aloneness), 29% to both reasons, and 8% did not know. In the "emotional attribution" group, 64% of the infants met Richman's criteria for a sleep problem as compared to only 22% sleep problems among the infants whose mothers attributed nightwaking to physical discomfort. The mean ISQ sleep problem score was 13.73 (SD=6.66) vs. 8.10 (SD=5.87), respectively, for the two attribution groups ( $F(2,58)=5.86$ ,  $p<.01$ ). Taking the infant into the parents' bed as a soothing practice was reported by 35% of the mothers.

MFQ was significantly correlated with the sleep problem score ( $r=.28$ ;  $p<.05$ ). When dividing the mothers according to a median split on the pleasure in the interaction score, it was revealed that mothers in the high pleasure group reported more awakenings compared to mothers with lower pleasure scores ( $t=2.03$ ;  $p<.05$ ). In addition, mothers who reported that they use co-sleeping as a soothing strategy had higher pleasure scores ( $t=3.00$ ;  $p<.05$ ). Finally, in an attempt to explain the contribution of the attachment variables (anxiety and avoidance) and the emotional tie scales (pleasure and hostility) to the prediction of the child's sleep, a multiple step-wise regression was conducted. Together, the predictors significantly accounted for 14% of the sleep problem variance. However, the pleasure scale was the only significant contributor ( $\beta=.34$ ).

## DISCUSSION

Around one year of age, sleep difficulties, as measured with the ISQ (27), were reported by 46% of the mothers. The high prevalence of

**Table 2. The association between the relationships scales and infants' sleep: Pearson correlation coefficients**

	Anxiety	Hostility	Pleasure	Sleep problem	Nightwaking index
Avoidance	.13	.03	.11	.15	.13
Anxiety		-.29*	-.12	.05	.04
Hostility			-.26*	-.14	-.10
Pleasure				.28*	.22+
Sleep problem					.86**

\*\* $p<.01$ , \* $p<.05$ , + $p<.1$

Turning to the main question of the study, Table 2 presents the associations among mothers' attachment, caregiving, and the child's sleep. As indicated, the attachment scales were not correlated with either the sleep problem score or with nightwaking index. When comparing the attachment classifications of infants with and without sleep problem, it was found that the prevalence of maternal insecurity in the two groups was similar ( $X^2=.36$ ; n.s). As to mothers' emotional tie toward the infant, the pleasure scale of the

sleep problems is in line with previous findings for Israeli infants (14), and somewhat higher compared to 38% sleep problems reported in a sample of U.K. mothers who completed the ISQ (27). When taking into account both mothers' and Richman's criteria (28), 31% of the present sample of infants, aged 9-15 months, were classified into the sleep problem group, twice as high compared to the prevalence reported for the British sample of infants, aged 12-18 months (27). This discrepancy may be partially due to age differences.

The end of the first year has been previously marked as a period with high prevalence of sleep problems (11,14). As noted earlier, this phenomenon is in line with developmental trends characteristic of the 9-12 month period (1,7,12,30). Contextual variables may also play a part in accounting for differences in sleep patterns across different samples. While cultural factors are known to shape caregiving practices (21), including nighttime parenting (24), the role of context in regulating biologically determined sleep-wake cycles is yet to be explored. Furthermore, as objective sleep measures, such as polysomnography or actigraphy were not recorded in the present study, disentangling maternal evaluation from the actual sleep pattern is not feasible. Within the scope of the present investigation, suffice is to underscore that almost half of the mothers considered their infant to have a sleep-related difficulty.

To what extent maternal attachment and caregiving variables correlate with the perception of the child's sleep? Mothers' internal model of attachment, as measured by close relationships with their partners (20), was not related to the child's reported sleep habits. Thus in the present non-referred group, the predicted linkage of maternal insecurity and child's sleep problems, which was based on findings pertaining to sleep disturbed children (15), was not sustained. Given the observed variability in the security and in the sleep scores, it is unlikely that the lack of association between the two variables reflects merely methodological limitations. A number of explanations may account for the discrepancy between the present results and those of Benoit et al. (15). First, the difference may stem from the contrast between children referred to sleep clinic (15) as opposed to non-referred infants with sleep difficulties. It is conceivable that different transactional models of relationships (31) account for how maternal variables modulate the child's sleep (32) in clinically disturbed population vs. in non-risk

mothers and their children. For example, correlation between positive affectional tie and sleep difficulties within normal variations of mother-child relationships, whereas for clinically referred sleep-disturbed children, maternal insecurity is an antecedent of her child's sleep disorder (15). Secondly, the discrepancy between the results of the two studies may be related to the different attachment constructs in the two studies: relationships with spouse vs. with the mother's own parents. While mothers' attachment relationships with her husband is likely to impact her parenting (3,17) it may be less relevant to her nighttime involvement with the child. It remains a task for a future study to further explore if in a low-risk sample, mothers' insecure attachment to their own parents predicts future sleep problems in the child. A third explanation is age-related: toddlers up to the age of 3 years (15) as opposed to 9 to 15 months of age, in the present sample. At the younger age, sleep regulation may be more related to developmental milestones (33,34), and to mother-child dyadic relationship (23) than to a more distal factor such as adult attachment.

Indeed, the present results revealed that mother-to-infant tie was significantly linked to sleep problems. It was found that positive feelings towards the child, as expressed by pleasure in interaction with the infant, were correlated with reported sleep difficulties. While this association is contrary to the assumption that disturbed mother-child relations are associated with sleep problems (4,15), they are in line with previous findings that positive emotional availability in mother-child daytime interaction was associated with more nightwaking (23). From a broad perspective of normal development this finding is important as it further illuminates aspects of the interplay between parenting and behavioral regulation. The present results suggest that parents may be inclined to be involved in nighttime parenting when they perceive the

interaction with their child as a source of enjoyment. A related implication is that self-regulation may be interfered when the affectional tie is overly expressed. Previous findings showing that high maternal separation anxiety was related to nightwaking (35) points in this direction. In a different but related vein, the present finding that when mothers attributed nightwaking to emotional reasons the severity of the sleep problem was higher, imply that mothers' interpretations of the child's stress may be related not only to their own anxiety, but in turn, impact the child's sleep. As we have not included in the present design a measure of bio-behavioral regulation and/or temperament assessment, the hypothesis that the emotional tie impacts how sleep-wake transitions are regulated can not be tested. A future longitudinal study designed to address the role of parenting in regulating sleep-wake states across time should throw light on this issue. How the various facets of parenting interact with the child's own constitution in modulating the development of normal and disordered sleep patterns, is a critical question to researchers and practitioners alike.

One avenue for addressing how mother and child negotiate sleep-related issues is through caregiving practices. Similar to the findings of others (28,36,37,38), sleep problems were associated with maternal presence at bedtime. Within the conceptual framework of the present study, this link may be due to the activation of the attachment system (proximity seeking at bedtime and during the night), along with the complementary activation of the caregiving system (proximity and involvement in regulating the child's sleep). While it is conceivable that the attachment and caregiving systems are involved in this link, a number of other factors should also be acknowledged. For example, constitutional variables, such as temperament, may account for regulatory difficulties in initiating sleep at bedtime and after an awakening had occurred (39,40,41),

or, a conditioned response to fall asleep in the presence of the parent at both points (38,42). These alternatives are, of course, not mutually exclusive. Given the methodological restrictions of the present study, it remains the task of future investigations to add temperament measures as well as follow up the dyads across time so that the causal links between child constitution and experiences pertaining to sleep may be further clarified. Notwithstanding the methodological shortcomings, the present findings that maternal perception of the sleep problem was associated with taking the infant into the parental bed is underscored in the context of the theoretical perspective undertaken in this study. Although the caregiving explanation for the link between nightwaking and nighttime parenting may be challenged, it is nevertheless, a plausible interpretation for linking child's distress at night with the provision of parental proximity. Interestingly, co-sleeping was associated with a positive affectional tie, suggesting perhaps that positive affectional tie facilitates nighttime caregiving. As we have not measured directly the caregiving system but merely nighttime involvement, conclusions about the interplay between maternal affection and caregiving should await further examination.

While addressing the question of relations among relations is beyond the theoretical scope of the present study, a few points are in order. First, among the present group of mothers 46% were classified as secure. The prevalence of security is in line with the distribution of attachment classification as measured with self-report measures (20,43). Second, although the intergenerational transmission of emotional ties was not addressed specifically, the finding that mothers' placement along the anxiety dimension correlated with the level of hostility towards the infant is in line with the concordance hypothesis (44). However, neither mothers' anxiety nor avoidance in the spousal



relationships were related to the pleasure in the interaction with the child. Furthermore, while less than 50% of the mothers had secure close adult relationships, overall, the emotional tie towards the infant was highly positive (3.31 and 3.48 on a scale of 4, respectively for pleasure and absence of hostility). It is not clear if this pattern of limited relations among relations reflects a general feature of the multi-determined nature of parenting and attachment (8,17,21,45), or that it is specific to the present context. The finding that the affectional tie toward the infant was only marginally related to adult close relationships, may be culture specific. In this respect, while sampling Kibbutz participants allowed controlling for economic background and social support, studying relations and parenting within the kibbutz may have been both an advantage and a shortcoming of the present investigation. Moreover, the issue of attachment, caregiving and sleep within the kibbutz context may have a unique flavor as will be outlined below.

The issue of sleep and attachment in the kibbutz context has been addressed in a study that compared communal and home-based sleeping arrangements (46). It was found that communal sleeping was associated with a high prevalence of insecurely attached infants (52% compared to only 20% among the infants who slept with their parents). The communal sleeping arrangement, where infants slept with peers, away from their parents and monitored by unfamiliar watchwomen, is believed to have failed to provide the child's need for comfort when distressed at night. Since, the availability of a reliable and comforting figure is essential for the development of secure relationships (1,6,7,9), it may be argued that the communal sleeping arrangement, which was practiced, in the past, in the Kibbutz setting, may have compromised attachment security. Interestingly, the abandonment of the collective sleeping practice has been partially attributed to attachment-related findings and considerations

(46,47). While all the infants in the present study slept at home, the psychological impact of communal sleeping may still be present. If it turns out that the results obtained here are specific to the Kibbutz experience, then, the premise that the historical past communal sleeping experience continues to impact sleep-related issues among parents and their young children in the 21 century, should be considered in future studies. Ghost in the nursery (48) is one intriguing direction.

To conclude, while there is a sound theoretical base for the premise of a dynamic interplay among attachment, caregiving and infants' sleep, the empirical evidence is far from sufficient. Hence, the present study further examined if and how relations and emotional ties within the family impact sleep-related difficulties and negotiations. The results revealed that maternal affect plays a role in modulating sleep-related issues. The link between mother's emotions and the child's sleep was indicated in respect to her affectional tie toward the infant but not in reference to the spousal attachment relationships. The main finding was that maternal affection, specifically, positive feelings toward the infant, was associated with more sleep problems. While a number of factors may contribute to this correlation, transactional processes are likely to be involved. A future longitudinal study should examine the directional links between child factors and parental practices and further address the role of relationships as modulators of sleep habits across time. How infant's sleep and arousal states modulate attachment relationships, and how parent-child attachment, in turn, impact the child's sleep regulation, need to be further investigated. Clarifying this interplay is not only a research challenge but a task with applied relevance. Future sleep investigations should continue to examine attachment constructs in normal development as well as in clinical populations and study diverse child-rearing contexts.

## REFERENCES

1. Bowlby J. *Attachment and Loss, Vol. I: Attachment*. London: Hogarth Press, 1969.
2. Solomon J, George C. Defining the caregiving system: toward a theory of caregiving. *Infant Mental Health J* 1996;17:183-197.
3. George C, Solomon J. Attachment and caregiving: the caregiving behavioral system. In: Cassidy J, Shaver P, eds. *Handbook of Attachment*. NY: Guilford, 1999;649-687.
4. Anders TF. Infant sleep, nighttime relationships, and attachment. *Psychiatry* 1994;57:11-21.
5. Cassidy J. The nature of the child's ties. In: Cassidy J, Shaver P, eds. *Handbook of Attachment*. NY: Guilford, 1999;3-20 .
6. Bowlby J. *Attachment and Loss, Vol. II: Separation*. New York: Basic Books, 1973.
7. Ainsworth MDS, Blehar MC, Waters E, Wall S. *Patterns of Attachment*. Hillsdale, N.J.: Erlbaum, 1978.
8. De Wolff MS, van IJzendoorn MH. Sensitivity and attachment: A meta-analysis on parental antecedents of infant attachment. *Child Development* 1997;68:571-591.
9. Bowlby J. *A Secure Base*. New-York: Basic Books, 1988.
10. Salzarulo P, Fagioli I. Changes of sleep states and physiological activities across the first year. In: Kalverboer AF, Genta ML, Hopkins JB., eds. *Current issues in developmental psychology: Biopsychological perspectives*. Dordrecht, NL: Kluwer, 1999;53-73.
11. Scher A. A longitudinal study of night waking in the first year. *Child: Care, Health and Development* 1991;17:295-302.
12. Freud A. *Normality and pathology in childhood*. New York: International University press, 1965.
13. Moore MS. Disturbed attachment in children: A function in sleep disturbance, altered dream production and immune dysfunction. Not safe to sleep: Chronic sleep disturbances in anxious attachment. *J Child Psychotherapy* 1989;15:99-111.
14. Scher A. Attachment and Sleep: A study of night waking in 12 month-old infants. *Developmental Psychobiology* 2001;38:274-285.
15. Benoit D, Zeanah CH, Boucher C, Minde KK. Sleep disorders in early childhood: Association with insecure maternal attachment. *J American Academy Child Adolescent Psychiatry* 1992;31:86-93.
16. George C, Kaplan N, Maine M. *Adult Attachment Interview*. Unpublished manuscript. University of California at Berkeley, 1984.
17. Belsky J. The determinants of parenting: A process model. *Child Development* 1984;55:83-96.
18. Hazan C, Shaver PR. Romantic love conceptualized as an attachment process. *J Personality and Social Psychology* 1987;52:511-524.
19. Bartholomew K, Shaver PR. Methods of assessing adult attachment: Do they converge? In: Simpson JA, Rholes WS, eds. *Attachment Theory and Close Relationships*. New York: Guilford, 1998;25-45.
20. Brennan KA, Clark CL, Shaver PR. Self-report measures of adult romantic attachment. An integrative overview. In: Simpson JA, Rholes WS, eds. *Attachment Theory and Close Relationships*. New York: Guilford, 1998;46-75.
21. Bornstein MH. *Handbook of parenting (2nd ed.)* Mahwah NJ: LEA, 2002.
22. Emde RN. Emotional availability: A reciprocal reward system for infants and parents with implications for preventions of psychosocial disorders. In: Taylor PM, ed. *Parent-infant relationships*. Orlando, FL: Grune & Stratton, 1980;87-115.
23. Scher A. Mother-child interaction and sleep regulation in one-year-olds. *Infant Mental Health J* 2001;22:515-528.
24. Harkness S, Super CM. Parents' cultural belief systems: Their origins, expressions and consequences. New York: Guilford Press; 1996.
25. Aviezer O, van IJzendoorn MH, Sagi A, Schuengel C. "Children of the dream" revisited: 70 years of collective early care in Israeli kibbutzim. *Psychological Bulletin* 1994;116:99-116.
26. Condon JT, Corkindale CJ. The assessment of parent-to-infant attachment: development of self-report questionnaire instrument. *J Reproduction and Infant Psychology* 1998;16: 57-76.
27. Morrell JMB. The infant sleep questionnaire: A new tool to assess infant sleep problems for clinical and research purposes. *Child Psychology & Psychiatry Review* 1994;20-26.
28. Richman N. A community survey of characteristics of one-to-two year olds with sleep disruptions. *J American Academy Child Psychiatry* 1981;20:281-291.
29. Scher A, Tirosh E, Rubin L, Sadeh A, Lavie P. Sleep patterns of infants and young children in Israel. *International J Behavioral Development* 1995;4:701-711.
30. Mahler MS, Pine F, Bergman A. *The Psychological Birth of the Human Infant-Symbiosis and Individuation*. New York: Basic Books, 1975.
31. Sameroff A. General systems and regulation of development. In: Gunnar M, Thelen E., eds. *Systems and development*. Hillsdale, N.J.: LEA, 1989;219-235.
32. Goodlin-Jones BL, Burnham MM, Anders TF. Sleep and sleep disturbances, regulatory processes in infancy. In: Sameroff A, Lewis M, Miller SM, eds. *Handbook of Developmental Psychopathology*. NY: Kluwer, 2000;309-325.

33. Scher A, Ratson M. Motor development and sleep problems among 9-month-olds. *Perceptual and Motor Skills* 1998;87:1218.
34. Scher A, Amir T, Tirosh E. Object concept and sleep regulation. *Perceptual and Motor Skills* 2000;91:402-404.
35. Scher A, Blumberg O. Night waking among 1-year olds: a study of maternal separation anxiety. *Child: Care Health and Development* 1999;25:323-334.
36. Adair R, Bauchner H, Philipp B, Levenson S, Zuckerman B. Night waking during infancy: Role of parental presence at bedtime. *Pediatrics* 1991;87:500-504.
37. Crowell J, Kenner M, Ginsburg N, Anders T. Sleep habits in toddlers 18 to 36 months old. *J American Academy Child and Adolescent Psychiatry* 1987;26:510-515.
38. Morrell J, Cortina-Borja M. The developmental change in strategies parents employ to settle young children to sleep, and their relationship to infant sleeping problems, as assessed by a new questionnaire: The parental interactive bedtime behaviour scale. *Infant and Child Development* 2001;11:17-41.
39. Carey WB. Night waking and temperament in infancy. *J Pediatrics* 1974;84:756-758.
40. Scher A, Tirosh E, Lavie P. The relationship between sleep and temperament revisited: Evidence for 12-month-olds. *J Child Psychology and Psychiatry* 1998;39:785-788.
41. Hayes MJ, Parker KG, Sallinen B, Davare AA. Bedsharing temperament, and sleep disturbance in early childhood. *Sleep* 2001;24:657-662.
42. Hayes MJ, Roberts SM, Stowe R. Early childhood co-sleeping: parent-child and parent-infant nighttime interactions. *Infant Mental Health J* 1996;17:348-357.
43. Bartholomew K, Horowitz LM. Attachment styles among young adults: A test of four category model. *J Personality and Social Psychology* 1990;61:226-244.
44. Fonagy P, Steele H, Steel M. Maternal representation of attachment during pregnancy predict the organization of infant-mother attachment at one year of age. *Child Development* 1991;62:891-905.
45. Berlin LJ, Cassidy J. Relations among relations. In: Cassidy J, Shaver P, eds. *Handbook of Attachment*. NY: Guilford, 1999;688-712.
46. Sagi A, van IJzendoorn MH, Aviezer O, Donnell F, Mayselless O. Sleeping out of home in a kibbutz communal arrangement: It makes a difference for infant-mother attachment. *Child Development* 1994;65:992-1004.
47. Oppenheim D. Perspectives on infant mental health from Israel: the case of changes in collective sleeping on the Kibbutz. *Infant Mental Health J* 1998;19:76-86.
48. Fraiberg S, Adelson E, Shapiro V. Ghosts in the nursery. *J American Academy Child Psychiatry* 1975;14:387-421.