

ORIGINAL ARTICLE

Attachment of Mothers and Children with Recurrent Asthmatic Bronchitis

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ABSTRACT

Objective: This study on attachment in children with recurrent asthmatic bronchitis and their mothers addresses three issues. The first aim was to test whether children affected by recurrent asthmatic bronchitis more often display an insecure pattern of attachment in comparison with healthy children. The second aim was to verify whether the distribution of adult attachment representations in the mothers of children affected by recurrent asthmatic bronchitis is different from the one shown by the mothers of the healthy comparison group. The third aim was to investigate intergenerational transmission of attachment. *Methods:* Sixty Italian children, aged between 2 and 5 years, and their mothers participated in the study. The Adult Attachment Interview and the Attachment Q-Sort were used to assess, respectively, the security of mothers' attachment representations and of mother-child attachment. *Results:* Children affected by recurrent asthmatic bronchitis appeared to be less secure in comparison with healthy children. Their mothers showed a higher percentage of insecure attachment representations. Finally, the intergenerational transmission of attachment was not influenced by the preclinical condition of the children. *Conclusions:* We propose a model of genetic and social transmission of insecure attachments in families struggling with asthma.

Key Words: Adult attachment; Mother-child attachment; Recurrent asthmatic bronchitis.

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INTRODUCTION

Pediatric asthma is one of the most common chronic diseases in childhood, often revealing itself before the fifth year of age (1). Asthma occurs in about 5%–10% of the children, and asthma prevalence is increasing within Western society (2). Asthma is a physical disease connected with respiratory difficulties, but it also may influence the socialization practices and social development of the affected children (3–7). Children with asthma are more often and longer absent from school, compared to their classmates, although their school performance is similar to that of children without asthma (8). Moreover, particularly children with severe asthma show higher scores on internalizing behavior problems and on rejection by peers (9). When faced with problems with schoolwork, they have been found to cope more aggressively (10).

Research and clinical experiences have documented the relevance of socioemotional factors influencing the onset of asthma, its persistence in time, and the improvement of the prognosis (11–13). Some investigators have even considered asthma to be a “family” disease (14,15). Although specific family dynamics may be involved in the child’s manifestation of asthmatic symptoms, asthma is considered an organic illness (16–18). Asthma may be exacerbated by socioemotional stimuli, [e.g., the emotional stress connected with specific patterns of relationships experienced by the child within the family or within its social context (19–22)], but its etiology is somatic and a genetic component may be involved (23,24).

Research on family life and child-rearing practices has not revealed a unique or specific pathogenic pattern of mother-child relationships in families of children with asthma. Nevertheless, several studies have highlighted that some of these families are characterized by an overprotective relationship of the mother to the child with asthma and by excessive maternal anxiety. Such overprotective, anxious, and sometimes overly critical parental attitudes may become a permanent stressing condition, which could contribute to the increase of the frequency and the severity of asthmatic episodes (25–30). However, it remains difficult to establish cause-effect relations between parenting and asthma, because the asthmatic condition may also increase feelings of overprotectiveness and anxiety in the parents (19).

Insecure attachment representations in mothers and insecure attachment relationships between mothers and their children may be considered as a risk factor for socioemotional and behavioral problems among pre-school-aged children (31). In asthma, insecure attachments may increase both the severity of asthmatic symptoms and the consequences of asthma for the

children’s socioemotional development (32). The concept of “attachment” refers to an enduring affective bond between the child and a trusted adult, who is available to protect and to comfort the child especially in stressful circumstances such as illness, fatigue, and threatening situations (33–35). Although all children are genetically predisposed to develop an attachment relationship with protective caregivers, the quality of their attachment relationship is dependent on the history of interactions with their parents or other caregivers (36). Ainsworth and her coworkers (36) have shown that sensitive adults who perceive the child’s signals properly and respond to them readily, adequately, and consistently are more likely to establish secure attachment relationship with their children. In contrast, insensitive adults who are not able to be consistent and prompt in answering the signals of their children are more likely to develop insecure attachment relationships. This finding of a causal association between parental sensitivity and children’s attachment security has been confirmed in numerous investigations [see Refs. (37) and (38) for correlational and experimental evidence, respectively].

Parents’ own childhood attachment experiences may affect their attachment relationship with their children. Insensitive parents may have experienced insensitive parenting themselves, and they may have been unable to change the child-rearing pattern that they experienced in their childhood years (39). Mary Main and her coworkers developed the Adult Attachment Interview (AAI) (40) to assess the current mental representation of childhood attachment experiences. The Adult Attachment Interview is a semistructured, hour-long interview about issues of attachment, separation, and loss during childhood and adulthood. The content of the autobiographical story is not important; The way in which the story is told is important (41). In fact, the interview constitutes a dual task. On the one hand, the participants must focus on their attachment experiences, which in the case of bad experiences may sometimes be very uncomfortable. On the other hand, when contemplating their past, the participants should keep focused on the discourse and remain in touch with the interviewer and the interview context. For many subjects, this dual task is very stressful and even insolvable (42,43). In particular, the insecure adults are not able to complete this dual task successfully. They remain too much focused either on the discourse context or on the past experiences. Only the secure subjects are able to keep a balance between focus on the present discourse and the past experiences, even when they were treated badly in their childhood. It is the discourse style—and not the attachment experiences per se—that determines the security of attachment representations.



In "normal," nonclinical groups, attachment representations of parents have been shown to influence their parenting style and their children's attachment relationship. Intergenerational transmission of attachment suggests an analogy of adult and infant strategies to cope with negative emotions (i.e., insecure parents would develop insecure attachments with their children), and secure parents would relate in a secure way to their children. The correspondence between parental attachment and infant attachment has been examined in numerous studies. A meta-analysis showed that the infant and parent attachment classifications are strongly associated (44). Even when the mother is interviewed before the birth of her infant, her attachment security is highly predictive of the infant's security more than a year later as, for example, Fonagy, Steele, and Steele (45) showed in their British study. Part of the transmission mechanism is parental sensitivity. Sensitivity is related to attachment (37) as well as to parents' attachment representations (44). Insecure parents are often less able to perceive their children's signals and to respond to them adequately and promptly than secure parents, which in turn influences the children's attachment security (46,47).

Wood and colleagues (22) proposed a Bio-Behavioral Family Model (BBFM), which includes factors responsible for the severity of the asthmatic disease, and they assigned a significant role to attachment processes. According to the authors, secure attachment patterns may contribute to buffer the impact of stressful events or family problems on both the physiological and psychological processes in the child, whereas insecure attachments would exacerbate the negative impact of physical handicaps and illnesses such as asthma (48). In children with asthma, family relationships characterized by insecure attachment patterns would evoke feelings of helplessness. In line with this model, Mrazek and colleagues (32) found a higher rate of insecure attachments in children with severe asthma than with a healthy group. It is interesting that they also found an association between attachment security and the severity of behavioral problems shown by preschool age children with asthma. Children who show a secure attachment relationship with their mothers revealed fewer behavioral problems than insecurely attached children with asthma. This finding suggests that attachment security may represent an important protective factor for the child. However, the interpretation of this promising finding is rendered somewhat difficult because of the age of the children involved (the age range of the asthmatic sample was 37–69 months with a mean age of 52.6 months) and the weaker validity of attachment measures for older children (49). Moreover, the

children in Mrazek's sample had very severe and uncontrolled asthma, and the findings may be restricted to this specific group of asthmatic children.

Studies on asthma-related family features, such as the mother-child relationship, have rarely taken into account children below 4 years of age. This is partly due to the fact that the asthmatic pathology can hardly be diagnosed in a valid way before the fourth year of age. Before this age, only "precursors" of asthma can be observed (e.g., recurrent asthmatic bronchitis). In this respect, Saga, Mochizuki, Tokuyama, and Morikawa (50) observed a high tendency to develop asthma especially in children with a clinical diagnosis of bronchiolitis or wheezy bronchitis and in children who show bronchial hyperresponsiveness in infancy. Although it is not axiomatic that all the children affected by recurrent asthmatic bronchitis become asthmatic, this condition in some infants precedes and predicts asthmatic pathology later on (51). Therefore, we decided to investigate attachment processes in families with young children suffering from recurrent asthmatic bronchitis.

The present study addresses several related issues. First, we investigate the quality of mother-child attachment relationships in a sample of participants at risk for asthma in infancy and early childhood (i.e., children affected by recurrent asthmatic bronchitis). More specifically, the aim is to test whether children at risk for asthma, but not showing an asthma diagnosis yet, more often display an insecure pattern of attachment in comparison with healthy children. Children affected by asthmatic bronchitis disease may be at risk for developing insecure attachments as a consequence of the stressful conditions that characterize their relationships with the parents. As children with asthma, they may experience disruptions in the establishment of appropriate autonomy as a result of their respiratory difficulties and multiple hospitalizations during the process of finding a balance between attachment and exploration (32). Moreover, asthmatic symptoms may interfere with the mother-child relationship. For instance, mothers may establish an overprotective and insecure-ambivalent attachment relationship with their child because they feel insecure about their ability to take adequate care of the sick child. Parents may also refrain from committing themselves to the bond with their child with recurrent asthmatic bronchitis and develop an insecure-avoidant relationship as a result of their feelings of anxiety. The illness of the child may constitute for the mother an emotion of such intensity that it interferes with bonding emotions (26).

The second aim of this study is to test whether the distribution of secure and insecure adult attachment



representations in the mothers of the affected children is different from the one shown by the mothers of the healthy comparison group. To our knowledge, this study is the first to assess attachment representations in parents of children with asthma-related symptoms. We do not expect to find more insecure attachment representations in parents of children predisposed for asthmatic symptomatology, if these parents did not experience asthma themselves. Asthma, in fact, has an allergic component that might be genetically transmitted, and therefore, there is an elevated chance that parents of children with asthma have been asthmatic themselves. Because of the strains and stresses caused by their asthmatic condition in their childhood, these parents may more often display insecure representations of their attachment experiences. Moreover, if the stressful physical conditions persist into the present, the reorganization and updating of these insecure representations may become difficult or even impossible. Thus, we expect that parents with past or present asthma are more likely to have insecure attachment representations.

The third aim is to investigate intergenerational transmission of attachment. The transmission of attachment from mothers to their children has been documented in numerous studies on “normal,” nonclinical samples (43,44). The question is whether in families struggling with asthmatic symptoms, the same transmission of attachment can be observed. If parents of children predisposed for asthma show similar attachment representations to parents of healthy comparisons, and at the same time these children affected by asthmatic bronchitis were more often insecurely attached than their healthy comparisons, we would have some indication that the particular health condition of children with recurrent asthmatic bronchitis affects the family in a way that the parent-child relationship becomes more difficult. In that case, the stressful conditions of the “recurrent asthmatic bronchitis” group can be suggested to interfere with the intergenerational transmission of attachment and, thus, to produce a higher percentage of insecure attachment in affected children. The asthmatic condition would constitute a “contextual constraint” for the normal transmission of attachment across generations (52,53).

METHOD

Participants

Sixty Italian children (28 females), aged between 2 and 5 years ($M=3.80$; $SD=1.30$), and their mothers took part in this study. All participants were from families with both parents available; no maternal psychiatric

illness was present. The sample, recruited from the same urban area, was divided into two subsamples.

Subsample A (the “recurrent asthmatic bronchitis” group) consisted of 30 full-term children (14 females), between 2 and 5 years of age ($M=3.77$; $SD=1.29$), affected by recurrent asthmatic bronchitis. The educational level of their mothers was average (47% primary school; 33% high school; 20% university degree). Nine of 30 mothers were affected by asthma in childhood. The children in this subsample have been selected through the collaboration of local paediatricians, who after the parents’ informed consent, brought to our attention patients responding to criteria for the diagnosis of recurrent asthmatic bronchitis. Of the 40 children selected by pediatricians, 30 accepted participation in the study. For children from 0 to 5 years old, it is difficult to establish a definite asthma diagnosis, but it is more common to diagnose a recurrent asthmatic bronchitis disease: the “recurrent asthmatic” label is used to differentiate the pathology from common bronchitis (54). The criteria used by Italian pediatricians to diagnose recurrent asthmatic bronchitis are a translation of criteria for infants and children younger than 5 years of age spelled out by NHLBI (54). Specifically, three conditions are considered: 1) history of presence of episodic symptoms of airflow obstruction; 2) airflow obstruction, which is at least partially reversible; and 3) possibility to exclude alternative diagnoses. For all the children included in this subsample, these conditions were satisfied; 33% of children (10 of 30) were mild intermittent asthmatic (2 or less days with symptoms a week and 2 or less nights with symptoms a month); 30% (9 of 30) were mild persistent asthmatic (from 3 to 6 days with symptoms a week and from 3 to 4 nights with symptoms a month); 37% (11 of 30) were moderate persistent asthmatic (daily symptoms and 5 or more nights with symptoms a month); and no children of this subsample were severe persistent asthmatic (continual daily symptoms and frequent night symptoms).

During the last 6 months, children were all monitored by their pediatricians (on average once a month); for all children, inhaled steroids and long-acting bronchodilators as pharmacological therapy were used. In 19 children of this subsample, asthmatic bronchitis revealed itself before the 1st year of age. Since the onset of the pathology, 1 child had four hospitalizations; 2 children had three hospitalizations; 1 child had two hospitalizations; 8 children had one hospitalization; and 18 of the 30 children had no hospitalization.

At the time of data collection, all the children suffered from recurrent asthmatic bronchitis.

The participants of subsample B (comparison group) were selected through two public nursery schools



sharing the same characteristics (timetable, quality level of educational settings, and urban location) and within the same city (Bari, Italy) after the parent's informed consent. Of the children whose parents accepted participation in the study (45 of the 60 children who were approached), we included in the sample those 30 children who matched by sex and age with subjects of subsample A. The comparison group consisted of 30 full-term and healthy participants (14 females), between 2 and 5 years of age ($M=3.81$; $SD=1.30$). None of the children and mothers were ever affected by asthma. To guarantee the similarity between the two subsamples other than in terms of age and gender, other relevant variables were controlled. More specifically, the educational level of the mothers of the comparison children was similar ($\chi^2=1.13$; $p=0.57$) to that of the "recurrent asthmatic bronchitis" group (33% primary school, 40% high school, 27% university degree). Finally, as in subsample A, all participants of the comparison group were from families with both parents available and no maternal psychiatric illness was present. Hence, the two subsamples appeared to be well matched.

Procedures

The Adult Attachment Interview (AAI)

The AAI (40) was used to assess the security of adult attachment representations of the mothers in both subsamples. The AAI consisted of 15 questions that stimulate the participants to describe and evaluate topics such as the attachment relationships in their infancy, the separations from these figures, the loss of attachment figures, and the effects of these events on their development and on personality. The analysis of the interviews, based on verbatim transcriptions of the audiotaped records, was conducted according to a validated set of guidelines (41) and focused in particular on the coherence of discourse about attachment-related experiences.

Interviews were coded into one of four classifications, indicating four types of attachment representations: insecure-dismissing, autonomous/secure, insecure-preoccupied, and unresolved attachment. *Insecure-dismissing* participants often present a very positive global evaluation of their attachment experiences, without being able to illustrate it with concrete events. They tell the interviewer that they are unable to remember much of their childhood experiences. When they acknowledge negative aspects of their childhood, they insist that they have remained untouched or even have profited from those experiences. *Insecure-dismissing* subjects seem to minimize or deactivate their attachment concerns. *Autonomous or secure* subjects are able to describe

attachment-related experiences coherently, whether these experiences were negative or positive. They present a coherent and balanced picture without idealizations and other contradictions. *Insecure-preoccupied* adults are still overwhelmed by their past attachment experiences; they feel mistreated by their parents and are not able to tell a coherent story. They express involved anger when they discuss the past and present relationship with their parents. They are said to maximize or hyperactivate their attachment concerns (35,55). The AAI has been thoroughly validated (56–58). Coders were trained by Nino Dazzi and Deborah Jacobvitz, and they were both blind for the study hypotheses and the subsample to which the participant belonged. Inter-coder reliability established on 20% cases was acceptable ($Kappa=0.70$).

The Attachment Q Sort (AQS)

To assess the security of the mother-child attachment relationship, the researcher asked the mother to meet with her and her child at home twice during the same week. These two sessions, which lasted 2 hours each, aimed at observing the child's behavior within the family context. At the end of the two observation sessions, the observer described the child's typical (attachment) behavior by sorting the 90 cards that constitute the validated Italian version (59) of the Attachment Q-sort (AQS) (60,61). The AQS is an observational tool, based on the Q-sort technique. The task of the researcher is to observe the child using the cards to describe the observed behavior (Q-description). The security score was computed by correlating the observer's Q-description with the criterion sort for security based on experts' sorts of the AQS for an ideal securely attached child. At the time AQS was sorted, children had not manifested asthmatic symptoms since the previous day: this was a necessary condition to be satisfied because the child's illness may interfere with the balance between attachment and exploratory behaviors (33). The observations were conducted by a trained observer different from the coder who classified the AAI results, and the home observer was both blind to the study hypotheses and the AAI results. She was also blind to which children had asthmatic bronchitis.

The interrater reliability of the AQS data was computed on 50% of the observed children; the average correlation of AQS scores assigned by two independent observers to the same subject was $r=0.90$.

We used five subscales of the AQS created by Howes and Ritchie (62), to assess differences between the groups for specific aspects of their attachment relationships. To create the subscales, using the scores



of AQS items from a large sample ($N=3062$) of teacher-child pairs, Howes and Ritchie (62) calculated scores for the 13 previously published subscales (63–65). Computing a factor analysis on the sample, they obtained five factors [AQS item numbers that loaded on these factors can be found in Howes and Ritchie, (62)] labeled *Avoidance*, *Resistance*, *Seeking comfort*, *Secure base*, and *Harmony*. The subscale scores were obtained by summing the AQS items included in each of the resulted five factors and dividing the sum by the number of items.

RESULTS

As a preliminary analysis, the association of gender with the quality of the mother-child attachment relationship was investigated. To this purpose, we performed a t -test for independent samples on the security scores derived from AQS, with gender as a factor. Results did not reveal a significant difference [$t(58)=-0.76$; $p=0.44$] between the average security scores of males ($M=0.27$; $SD=0.27$) and females ($M=0.31$; $SD=0.20$). The correlation of children's age and their attachment security was not significant [$r(58)=0.22$; $p=0.09$].

Mother-Child Attachment

To test our first hypothesis of a higher incidence of insecure attachment patterns within the recurrent asthmatic bronchitis group, we performed a t -test for independent samples on the security scores derived from the AQS, with group (recurrent asthmatic

bronchitis vs. comparison) as a factor. Results revealed a significant difference between the AQS security scores [$t(58)=-2.93$; $p=0.005$]. More specifically, the security scores obtained by the recurrent asthmatic bronchitis group ($M=0.20$; $SD=0.27$) were significantly lower than the ones obtained by the comparison group ($M=0.37$; $SD=0.17$). The security scores obtained by the asthmatic bronchitis group were similar to the average scores obtained by a clinical Italian sample (children affected by atopic dermatitis: $M=0.22$; $SD=0.17$) of same aged children (66) The security scores obtained by the comparison group were similar to the average scores reported in another study conducted in a nonclinical Italian sample (67) of same aged children ($M=0.38$; $SD=0.25$) and in a sample (68) of younger children (mean age: 26.6 months; $M=0.33$; $SD=0.27$).

To test if this difference in attachment security would pertain to specific aspects of the attachment relationship, we conducted a one-way multivariate analysis of variance for independent samples on the five AQS subscales (Avoidance, Resistance, Seeking comfort, Secure base, and Harmony) with group (recurrent asthmatic bronchitis vs. comparison) as independent variable. The groups differed significantly on the combined dependent variables [$F(5, 54)=8.09$; $p<0.001$]. To determine which subscales contributed to the overall multivariate effect, five univariate t -tests were performed, with a Bonferroniized alpha level of $0.10/5=0.02$ [Ref. (69), p. 122]. Results (see Table 1) revealed statistically significant differences between the subscales scores of the asthmatic and the comparison groups, except for the Secure base subscale.

Lastly, a nonparametric correlation between the severity of asthmatic bronchitis (1=mild intermittent;

Table 1. AQS security scores and AQS subscales scores in the “recurrent asthmatic bronchitis” and in the “comparison” groups.

	Asthmatic bronchitis group		Comparison group		
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>t</i> (58)
Overall AQS security score	0.20	0.27	0.37	0.17	-2.93**
<i>AQS subscale scores</i>					
Seeks comfort	5.02	1.50	5.94	1.55	-2.38*
Harmony	5.68	1.30	6.55	0.70	-3.22**
Secure base	4.92	1.09	5.09	1.14	-0.36
Avoid	5.77	0.93	4.64	0.61	5.52***
Resist	4.07	1.03	3.44	0.82	2.60**

* $p<0.05$.

** $p<0.01$.

*** $p<0.001$.



4=severe persistent) and the security scores of attachment was performed; results revealed no significant association (Spearman's $\rho = -0.14$; $p = 0.45$) between the two considered variables.

Maternal Attachment Representations

The second aim of this study was to test if the distribution of adult attachment representations in the mothers of children with recurrent asthmatic bronchitis was different from the one shown by the mothers in the comparison group. A chi-square test was performed on the cross-tabulation of attachment representations (secure vs. insecure) and group (recurrent asthmatic bronchitis vs. comparison). Results revealed a significantly higher rate of insecure attachment representations among mothers of children affected by asthmatic bronchitis [χ^2 (1, $N=60$)=5.40; $p=0.038$] (Table 2). If the insecure category was decomposed into Dismissing and Preoccupied attachment representations, it was clear that Preoccupied attachment was overrepresented in the mothers of the recurrent asthmatic bronchitis group (adjusted standardized residual was $z=2.1$) (see Table 2).

In the recurrent asthmatic bronchitis group, we also tested whether the occurrence of asthma during their childhood was associated with the security of mothers' attachment representations. A chi-square test was conducted on the cross-tabulation of maternal attachment representations (secure vs. insecure) and absence vs. presence of asthma in one of the parents. Results showed that within the recurrent asthmatic bronchitis group, the rate of insecurely attached mothers was significantly higher (100% vs. 47.6%)

Table 2. Frequencies of mothers' attachment categories (AAI) within both groups.

Mothers' attachment (AAI)	Asthmatic bronchitis group ($n=30$)	Comparison group ($n=30$)
Insecure	19 (2.3)	10 (-2.3)
Secure	11 (-2.3)	20 (2.3)
Dismissing	11 (0.8)	8 (-0.8)
Preoccupied	8 (2.1)	2 (-2.1)
Secure	11 (-2.3)	20 (2.3)

Note: Values enclosed in parentheses represent adjusted standardized residual.
 $\chi^2 = 5.41$; $p = 0.019$.
 $\chi^2 = 6.69$; $p = 0.03$.

Table 3. Frequencies of mothers' attachment categories (AAI) within the "recurrent asthmatic bronchitis" group.

Mothers' attachment (AAI)	Presence of asthma in mothers' childhood	
	Yes	No
Insecure	9 (2.7)	10 (-2.7)
Secure	0 (-2.7)	11 (2.7)

Note: Values enclosed in parentheses represent adjusted standardized residual.
 $\chi^2 = 7.44$; $p < 0.01$.

when the parent had experienced asthma in her own childhood [χ^2 (1, $N=30$)=7.44; $p=0.011$] (Table 3).

Intergenerational Transmission of Attachment

The third aim of this study was to confirm the association between maternal and child attachment security (intergenerational transmission of attachment), in particular in the comparison group, and to test whether in the recurrent asthmatic bronchitis group the asthmatic condition of the parent would constrain this transmission process. In the total group, the mean attachment security score for the children of the secure mothers was $M=0.35$ ($n=31$; $SD=0.22$), and the mean score for the children of the insecure mothers was $M=0.22$ ($n=29$; $SD=0.24$). The association was significant [F (1, 58)=4.75; $p=0.03$; $\eta^2=0.28$]. In the comparison group, the mean attachment security score for the children of the secure mothers was $M=0.40$ ($n=20$; $SD=0.16$) and the mean score for the children of the insecure mothers was $M=0.32$ ($n=10$; $SD=0.20$). The association was not significant [F (1, 28)=1.47; $p=0.23$; $\eta^2=0.22$]. In the recurrent asthmatic bronchitis group, the mean security score for the children of the secure mothers was $M=0.26$ ($n=11$; $SD=0.30$), and the mean score for the children of the insecure mothers was $M=0.17$ ($n=19$; $SD=0.25$). The association was not significant [F (1, 28)=0.85; $p=0.36$; $\eta^2=0.17$]. Although we found a trend toward the transmission of attachment in both the recurrent asthmatic bronchitis and the comparison group, the association was only significant in the total group, and we did not document a constraint on the transmission of attachment because of the recurrent asthmatic bronchitis condition.

In a hierarchical multiple regression, we tried to explain a significant part of the variance in children's attachment security on the basis of the following predictors: Age of child, maternal attachment security, group (recurrent asthmatic bronchitis or comparison),

and the interaction between group and maternal attachment security. The interaction did not explain a significant part of the variance. The multiple correlation between children's attachment security and the three remaining predictors was $R=0.48$ [adjusted percentage of explained variance: 19%; $F(3, 56)=5.54$; $p=0.002$]. Age was entered first to control for age differences ($R=0.22$; R^2 change=0.05; F change (1, 58)=3.07; $p=0.08$). Maternal attachment security contributed significantly to the equation [$R=0.40$; R^2 change=0.11; F change (1, 57)=7.22; $p=0.009$]. Lastly, group membership also contributed significantly to the equation [$R=0.48$; R^2 change=.07; F change (1, 56)=5.20; $p=0.026$]. In multivariate perspective, we showed substantial intergenerational transmission of attachment regardless of group membership. Thus, we did not find evidence that children's recurrent asthmatic bronchitis condition would lead to constraints on the transmission of attachment, although the recurrent asthmatic bronchitis group was significantly less securely attached to their parents than the comparisons.

DISCUSSION AND CONCLUSIONS

The current study shows that young children with recurrent asthmatic bronchitis were less securely attached to their mothers than healthy comparisons. The mothers of children with recurrent asthmatic bronchitis were more often classified as insecurely attached on the basis of the discussion of their own childhood attachment experiences. In particular, those mothers who suffered from asthma themselves were most liable to display insecure attachment representations. We were able to document the intergenerational transmission of attachment in both the recurrent asthmatic bronchitis group and the healthy comparison group. The overrepresentation of insecurely attached children in the recurrent asthmatic bronchitis group is at least partly associated with the overrepresentation of (formerly) asthmatic and insecurely attached parents in these families.

We investigated three related issues. Our first aim was to test whether children affected by recurrent asthmatic bronchitis, a condition that generally precedes and predicts asthmatic pathology later on, display a higher rate of insecure attachment in comparison with healthy children. Several studies have documented the presence of pathogenic patterns of mother-child relationships in families of children with asthma; nevertheless, they have rarely taken into account children below 4 years of age because it is difficult to diagnose the asthmatic pathology in the first years of

life. In the present study we focused on the quality of mother-infant attachment in a sample of children at risk for asthma [i.e., children affected by recurrent asthmatic bronchitis (50)] between 2 and 5 years of age. Our hypothesis was that children with recurrent asthmatic bronchitis are at risk for insecure attachment because their respiratory diseases may trigger in their parents overprotective or neglectful parental behaviors and, thus, interfere with the emergence of an appropriate balance between exploration and proximity seeking (32).

Children affected by asthmatic bronchitis indeed were less securely attached than healthy comparisons. This difference pertains to several aspects of the attachment relationship: children with recurrent asthmatic bronchitis showed more avoidance and resistance and less harmonious and comfort seeking behaviors than the healthy children. Avoidance and resistance indicate, respectively, insecure-avoidant and insecure-ambivalent attachment organizations in the observed children, whereas harmonious and comfort seeking behaviors describe the secure attachment organization (62). It should be noted that the association between asthmatic bronchitis and insecure attachment was found to be independent of the severity of the asthmatic condition; thus, less severe recurrent asthmatic bronchitis was also associated with insecure attachments. According to our hypothesis, difficulties caused by children's respiratory diseases on the one hand and the tendency of their mothers to establish an overprotective or rejecting relationship on the other hand (26) may interfere with the construction of a secure mother-infant attachment. Another possibility is that overprotective or rejecting child-rearing patterns are not so much provoked by the "asthmatic" condition of the children but may be rooted in the parents' own attachment experiences and representations. Wright et al. (70) showed that elevated stress in parents may lead to their children showing more respiratory problems (early childhood wheeze). Hence, it is possible that the mother's attachment problems put the children at risk for respiratory problems or aggravated these problems, in addition to the influence of asthmatic bronchitis on attachment problems.

Therefore, the second aim of the study was to verify whether the distribution of secure and insecure attachment representations in the mothers of children with asthmatic bronchitis indeed is similar to the distribution in the comparison mothers. To our knowledge (43,71,72), this is the first study documenting the security of attachment in parents of children at risk for an asthmatic condition. It is surprising that we found that mothers in the asthmatic bronchitis group



more often display insecure attachment representations than the mothers in the healthy comparison group. More specifically, the mothers of children with recurrent asthmatic bronchitis were more often preoccupied with regard to their own childhood attachment experiences than comparison mothers. It should be noted that insecure preoccupied attachment representations have been found to be associated with insensitive, overprotective parenting in nonclinical families (43). Thus, the overprotective parenting style observed in previous studies on families struggling with asthma (26) may be rooted in a preoccupied attachment representation of the parents.

In search for the origins of the insecure attachment representations in parents of children with recurrent asthmatic bronchitis, we also found that the presence of actual or previous asthma in one of the parents appeared to be a risk factor for the insecurity of mothers' attachment representation. Because of a genetic component of asthmatic bronchitis, mothers of children affected by recurrent asthmatic bronchitis may have experienced in their own childhood (and even in the presence) the strains and stresses caused by the respiratory disease. Although adults may overcome negative childhood attachment experiences, and devel-

op a so-called "earned secure" attachment representation (43,72,73), the actual presence of recurrent respiratory problems in their children may interfere with the reorganization and updating of their mental representation of attachment. Consequently, the higher rates of insecure attachments in children affected by asthmatic bronchitis may be caused by the normal process of intergenerational transmission of attachment.

To test the intergenerational transmission of attachment in the two groups was the third aim of our investigation. Our hypothesis was that recurrent asthmatic bronchitis in the children may interfere with the normal process of intergenerational transmission of attachment. Contrary to our expectation, we found that intergenerational transmission of attachment existed in the total group independently from the respiratory condition. The presence of the respiratory disease does not seem to interfere in a particular way with the transmission of attachment (in-)security. This finding converges with previous findings in studies on clinical infants and young children, for example, suffering from congenital heart diseases (74,75). The children's clinical condition does not impair or hamper the development of a secure attachment relationship with their parents if these parents are able to respond

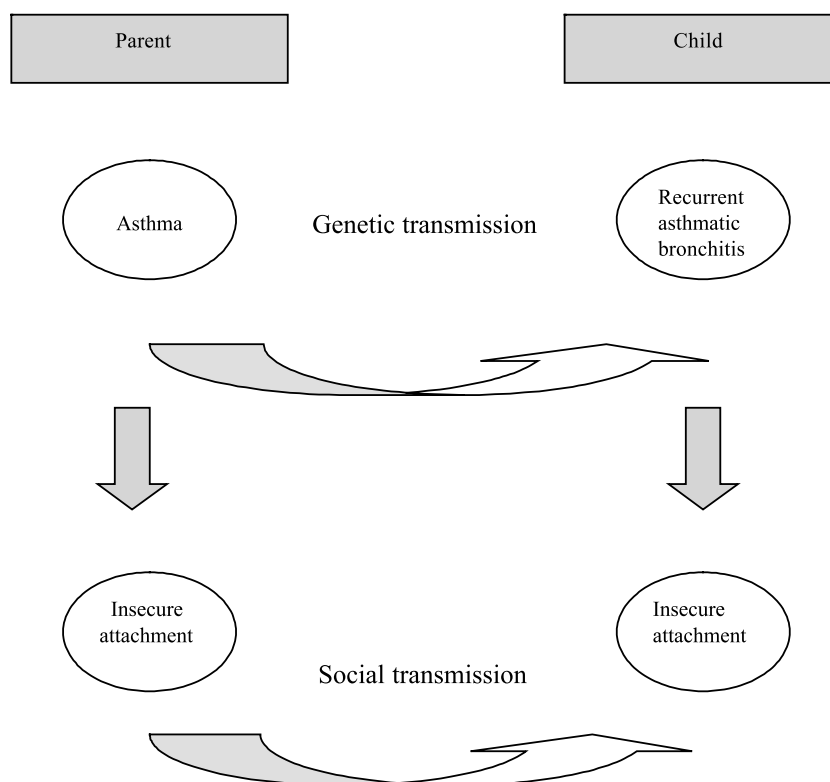


Figure 1. Transmission of insecure attachment across generations in families with asthmatic symptoms.



sensitively to their children's attachment signals (76). In contrast, parents with a clinical problem (e.g., depression) did not appear to be able to prevent their children from developing an insecure attachment. In the parent-child relationship, the parents seem to be more "powerful" in shaping the first attachment relationship than the children (76). In a similar vein, secure and sensitive parents of children with recurrent asthmatic bronchitis may be able to foster a secure attachment relationship, but when these parents are insecure because of their own asthmatic experiences, they may provoke an insecure attachment with their child. The recurrent asthmatic condition of the children in our study is, therefore, not a constraint on the intergenerational transmission of attachment, similar to the ecological constraint found in a previous kibbutz study (58).

Although our study is the first comprehensive investigation on intergenerational transmission of attachment in families facing recurrent asthmatic bronchitis in their young children, some limitations should be mentioned, as well as suggestions for further research. The most important limitation concerns the design of this cross-sectional study precluding causal interpretations of the findings. In fact, the model that emerges from our investigation suggests an important role for genetic as well as social transmission of attachment. In normal, nonclinical families, the role of genetics in the transmission of attachment seems rather small because individual differences in attachment security do not show a strong genetic component in behavior genetic studies on attachment in biologically unrelated children, siblings, and dizygotic or monozygotic twins (77,78). In parents with asthma and their children, the genetic transmission of the asthmatic condition may mediate the social transmission of attachment across generations (see Fig. 1). In Fig. 1, the attachment relationship of the child with the parent may be caused by 1) the direct influence of the recurrent asthmatic bronchitis on interactions between parent and child leading to a specific kind of attachment relationship, 2) by the direct influence of the parent's representation of attachment, or 3) by the combined and cumulative genetic and social transmission factors. Only a large-scale behavior genetic study of families with (dizygotic and monozygotic twin) children suffering from recurrent asthmatic bronchitis may tease apart these possible mechanisms. Only a longitudinal study may uncover the causal relations involved in the model. The current cross-sectional investigation certainly is insufficient to document causal relations or intergenerational transmission in the strict sense. Our study shows, however, that it may be fruitful to undertake such a longitudinal behavior genetics study.

In summary, children affected by recurrent asthmatic bronchitis appeared to be less secure in comparison with healthy children. Their mothers also showed a higher percentage of insecure attachment representations, in particular when they had suffered from asthma themselves. Finally, the intergenerational transmission of attachment did not seem to be influenced by the preclinical condition of the children, but it remains difficult to differentiate between genetic and social transmission of attachment in the families struggling with recurrent asthmatic bronchitis.

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