The effect of infant colic on maternal self-perceptions and mother–infant attachment

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Summary

Mothers of infants who developed colic were compared with mothers of non-colic infants on their perceptions of parenting self-efficacy, and separation anxiety as well as their attachment relationship with their infants. Colic was identified prospectively through telephone contacts with mothers. Questionnaires on self-efficacy and separation anxiety were completed when infants were 5 months of age. At 18 months of age mothers and infants (colic and non-colic) participated in a laboratory situation to measure attachment. Results revealed that mothers of colic infants reported feeling less competent as mothers. In addition, while mothers of colicky infants tended to have more separation anxiety than mothers of non-colic infants, they felt that these separations did not have a negative effect on their child. Finally, no differences were revealed for attachment classifications between colic and non-colic infants at 18 months.

Keywords: infant crying, colic, mother-infant attachment, maternal self-efficacy

Introduction

Since Bell’s (1968) seminal piece on the direction of child–parent effects, developmental research has intensified its focus on the extent to which a child’s characteristics influences parental behaviour and attitudes. Most notable is the child’s temperament. Literature has shown, particularly in the extreme case, that child behaviour not only influences how parents interact with their children but also affects their perceptions of their competency as a parent. Also evident is the impact of both of these factors on the development of the mother–child relationship. Whilst there has been considerable research on the effects of infant difficult temperament, i.e. everyday fussing and crying, little information is
available about the impact of infant colic, a temporary but stressful condition in which the infant cries excessively, intensely and inconsolably during the first 3 months of life.

The focus of infant colic research has been on the identification and aetiology of this condition. Interestingly, several researchers have proposed that parent behaviour and perceptions are implicated in the development of colic. For example, unresponsive parenting (Taubman 1984), maternal personality characteristics (Carey 1968), and maternal stress during pregnancy (Rautava et al. 1993) have been examined as antecedents of infant colic. Moreover, parents have reported high levels of stress during the time of colic (Humphrey & Hock 1989) which is believed to intensify the infants’ level of crying.

From a transactional perspective, one could argue that the stressful dynamic between the parent and the colicky infant could have short- and possibly long-term negative effects on the parent–child relationship. Indeed, in the extreme case, some have suggested that infants with colic are at the highest risk for child abuse (Schmitt 1987). The few studies that have examined the consequences of having a colicky child report conflicting results. While Shaw (1977) found that mothers of excessive criers were less responsive to the overtures of their infants, Stifter and Braungart (1992) found mothers of colic and non-colic infants to be alike in observed maternal sensitivity and intrusiveness. Differences in design and identification of excessive crying may account for these inconsistent findings. More recently, a study which examined maternal sensitivity and infant colic (St. James-Roberts et al. 1996) found mothers of colic infants to be less sensitive at 6 weeks than mothers of non-colic infants. By 5 months of age, however, these differences disappeared suggesting that maternal behaviour may be stressed when colic is at its peak but returns to normal levels when the colic is resolved. In contrast, studies which used maternal perceptions of temperament (e.g. Lehtonen et al. 1994) showed colicky infants to be rated as intense, negatively reactive, and difficult to manage later in infancy and childhood suggesting the alternative — that colicky infants may continue to stress the relationship well after the colic has ended. In the present study we attempt to clarify the short- and long-term effects of infant colic on parents by examining the influence of this extreme condition on maternal self-perceptions and the mother–infant relationship.

Maternal feelings of self-efficacy are hypothesized to be central to her ability to respond appropriately to infant cues and signals. Research has demonstrated that these feelings are affected by her perceptions of her infant’s temperament (Donovan & Leavitt 1985; Cutrona & Troutman 1986). Teti and Gelfand (1991), for example, found that the relationship between infant difficult
temperament and maternal behavioural competence was mediated by the mother’s feelings of efficacy. One reason for this relationship may be because mothers of difficult infants feel they get no positive reinforcement from interactions with their infants (Beebe et al. 1993). Having an infant with colic may also negatively affect maternal feelings of efficacy. Because colic is often characterized by inconsolableness, feelings of maternal competency may be greatly compromised if they are dependent upon interactions with a colicky baby. In support of this hypothesis is a study in which the ability to terminate an infant’s crying was controlled by the experimenters (Donovan & Leavitt 1985). Mothers who were unable to terminate the crying did poorly on a subsequent cry termination task. On the other hand, knowing that colic generally resolves after 3 months (Illingsworth 1954) may buffer this effect. One goal of the present study was to determine whether being the mother of a colicky infant influences feelings of parenting self-efficacy.

Having an infant with colic may also produce in mothers feelings of concern and anxiety that lead to overprotectiveness. Maternal anxiety measured during the neonatal period has been linked to the development of colic (Carey 1968; cf. Stifter & Braungart 1992). Furthermore, a relationship between early infant feeding and crying problems and later maternal perceptions of their child’s vulnerability has been identified (Forsyth & Canny 1991). This perception of vulnerability may increase a mother’s feelings of anxiety, particularly when she is away from her child (Humphrey & Hock 1989). For example, mothers of colicky infants may worry when their child is in the care of another. Interestingly, studies on the correlates of maternal separation anxiety showed that infants rated as negatively reactive (Fein et al. 1993) and unadaptable (McBride & Belsky 1988) had mothers who scored high on separation anxiety. In another study, mothers of infants with colic reported high maternal separation anxiety (Humphrey & Hock 1989). Each of these studies, however, used parent ratings of infant behaviour which may have been influenced by the mother’s level of anxiety at the time of measurement. To address the question of whether excessive crying affects mothers’ feelings of separation anxiety and to clarify the direction of this effect, the second goal of the present study was to compare mothers of colicky infants to mothers whose infants did not develop colic on a measure of maternal separation anxiety assessed 2 months after the colic had resolved.

While excessive crying that is inconsolable may have a detrimental effect on maternal feelings and behaviour, this impact may be short-lived due to colic’s self-limiting quality. But if mothers continue to perceive their infants as difficult and intense even after the colic has ended their interactions, and subsequently
the development of their attachment relationship, may be negatively affected. To date there have been no studies on the relationship between infant colic and attachment. Research on the influence of infant temperament on the mother-infant relationship, however, has been extensively investigated but the results are mixed (Vaughan et al. 1992; Seifer et al. 1996). While irritability or difficult temperament has been linked to attachment this association is usually qualified by other factors such as social support (Crockenberg 1981) and maternal personality (Mangelsdorf et al. 1990). Furthermore, a meta-analysis of the relationship between temperament and attachment has shown that the temperament dimension of proneness to distress was weakly related to the development of an insecure relationship (Goldsmith & Alansky 1987). The effect of excessive crying on attachment might also be indirect through the mother’s sensitive responsiveness to her child. Maternal sensitivity has been identified as an important antecedent of attachment. The evidence thus far has been equivocal but indicates that infant difficult temperament, be it measured by observation or parent ratings, affects how the mother interacts with her child (Crockenberg & McClosky 1986; Bates 1989). An infant who does not respond to attempts to alleviate negative states or who does not exhibit much positivity in response to interactive attempts by the mother may in turn elicit less sensitive behaviour from her. For example, van den Boom & Hoeksma (1994) found that mothers of irritable infants were more uninvolved and less responsive to positive signals than mothers of non-irritable infants. As noted earlier, however, recent studies on the effect of colic on maternal sensitivity have not shown this directional effect (Stifter & Braungart 1992; St.James-Roberts et al. 1996). In the present study we attempt to elucidate further the long-term effect of excessive crying on the mother infant relationship by examining the development of attachment in infants with colic.

In sum, the purpose of the present study was twofold: (1) to determine whether excessive crying, in the form of infant colic, has an effect on maternal self-perceptions of efficacy and separation anxiety; and (2) to examine the development of the attachment relationship between mothers and their colicky infants.

Methods

Subjects

One-hundred healthy, term infants and their mothers participated in a longitudinal study of infant temperament. All participants were recruited from
a local community hospital. Infants were equally divided by sex and birth order and came from predominantly middle-class homes. The mothers in this sample ranged in age 16–42 years, $M = 29.15$ years, and were highly educated, $M = 15.23$ years.

Infants who developed colic between test periods were identified through telephone contacts to mothers when infants were 3-, 4-, and 5-weeks of age. During each call mothers were questioned about the length and frequency of cry bouts that week and whether or not their infant was easily consoled. At no time during these telephone calls was the term ‘colic’ used by the researchers to identify infant crying. Using Wessel’s criteria of 3 or more hours of crying per day/3 or more days per week (Wessel et al. 1954), 12 infants were identified as having colic. Colic was then verified by having parents indicate the intensity and duration of cries in a cry diary (for further details on colic identification, see Stifter & Braungart 1992).

**Procedures and measures**

Subjects came to the laboratory at 5 months where they participated in several tasks (Stifter & Braungart 1992). Mothers were also asked to complete several questionnaires prior to their scheduled visit (see below). Mothers and infants returned to the laboratory at 18 months during which they participated in a procedure to assess attachment.

*Maternal self-efficacy questionnaire (Fish, Stifter & Belsky 1991)*

When the infants were 5 months of age mothers completed a self-efficacy questionnaire designed specifically for this study. This questionnaire asks mothers to rate their feelings about being a mother. Questions such as ‘Some days being a mother gets me down’ and ‘I think I have more difficulty being a mother than some other women do’ are rated on a 6-point scale from ‘strongly agree’ to ‘strongly disagree’. Scores are then totalled and can range from 20 (low self-efficacy) to 120 (high self-efficacy). This instrument has demonstrated satisfactory internal consistency with Cronbach alpha of 0.82 for the full scale (Fish et al. 1991).

*Maternal separation anxiety scale (Hock, McBride & Gnezda 1989)*

The Maternal Separation Anxiety Scale (MSAS) measures three domains of maternal feelings and attributes about separation from her child: maternal...
feelings of guilt about leaving her child (maternal separation anxiety); maternal beliefs about her child’s adjustment to separation (separation effects on the child); and maternal attitudes about balancing work and motherhood (employment-related separation concerns). Mothers responded to the questions on a 5-point scale ranging from ‘strongly disagree’ to ‘strongly agree.’ Responses to questions were summed for each domain and analysed separately.

Strange situation (Ainsworth & Wittig 1969)
At 18 months of age, 73 infant-mother pairs (10 colic, 63 controls) participated in a standardized laboratory procedure, the ‘strange situation’. This 21-minute procedure was designed to assess the quality of the infant’s relationship to his/her mother. During this procedure the mother and a female stranger alternately leave and return to the infant who remains in the laboratory. Based primarily on the infant’s behaviour during two reunions with the mother, the infant is classified into one of three attachment groups: secure (B) insecure/avoidant (A), and insecure/resistant (C). The reliability and validity of these classifications have been extensively demonstrated (Ainsworth et al. 1978; Bretherton 1985). Videotapes of the ‘strange situation’ were coded by two trained coders blind to the study’s hypotheses. Inter-rater reliability which was calculated on 30% of the sample, was 86%.

Results
All analyses were done with sex as an independent factor. No main or interaction effects were revealed thus the following analyses were performed collapsing across sex.

Maternal self-efficacy
Differences between the mothers of the colic and non-colic infants on maternal self-efficacy were tested using an ANOVA. The results revealed that mothers of infants who had colic reported feeling less competent as mothers than mothers whose infants did not have colic, $F (1,83) = 8.05, P < 0.01$. Figure 1 displays the data in graphic form.
Maternal separation anxiety

The three subscales of the MSAS questionnaire were submitted to univariate ANOVAs. A significant effect was found for the ‘separation effects on the child’ subscale. Mothers of infants who had colic reported feeling that separation did not have any negative effects on the child, $F(1,83) = 3.77$, $P < 0.05$, more so than mothers of infants who did not have colic. There was also a trend for mothers of colicky infants to be slightly more anxious about separation, $F(1,83) = 2.84$, $P < 0.1$, than mothers of non-colic infants (see Fig. 1).

Attachment

The distribution of the entire sample into the three attachment groups (secure: 74%, insecure/avoidant: 16%, insecure/resistant: 10%) is consistent with previous research (Ainsworth et al. 1978). The attachment classification distribution for the colic and non-colic infants was submitted to a chi-square analysis and was found to be non-significant, $\chi^2(2) = 3.27$, $P = 0.20$. As can be seen in Table 1, the distribution for the non-colic infants was similar to the sample distribution. On the other hand, while the majority of colic infants were classified as secure (B), only two of the infants were classified as insecure/resistant (C) and none was classified as insecure/avoidant (A).
Post hoc analyses

The above results revealed that even though their mothers reported feelings of low self-efficacy, the majority of the infants who had colic developed secure attachments. To further understand the processes that may have accounted for this outcome we performed a series of post hoc analyses by examining whether infant colic may have interacted with maternal feelings to produce an insecure attachment. Regardless of our low sample size, a 2 (colic/non-colic) / 2 (secure/insecure) ANOVA revealed a significant overall effect, $F(3,63) = 4.60$, $P < 0.006$, as well as a significant interaction effect, $F(1,65) = 5.28$, $P < 0.02$. An inspection of the means showed the mothers of infants who had colic and were classified as insecurely attached had significantly lower self-efficacy scores ($M = 59.0$) than any of the other groups (see Table 2). Analysis of variance was also performed on the maternal separation anxiety scales but the results were non-significant.

While we are aware that the reliability of these data are suspect due to the number of infants making up the colic/insecure group ($n = 2$), we investigated our data further in the interest of description and hypothesis generation. What we found was very interesting in light of the literature on infant irritability, maternal sensitivity and attachment (Seifer et al. 1996). As we have reported

### Table 1 Distribution of colic/non-colic infants by their attachment classification

<table>
<thead>
<tr>
<th>Attachment Classification</th>
<th>Colic</th>
<th>Non-colic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insecure/ambivalent (A)</td>
<td>0</td>
<td>12</td>
</tr>
<tr>
<td>Secure (B)</td>
<td>8</td>
<td>48</td>
</tr>
<tr>
<td>Insecure/resistant (C)</td>
<td>2</td>
<td>5</td>
</tr>
</tbody>
</table>

### Table 2 Means and standard deviation of maternal characteristics and behaviour by colic and attachment classification

<table>
<thead>
<tr>
<th>Maternal Characteristics</th>
<th>Secure M (SD)</th>
<th>Insecure M (SD)</th>
<th>Secure M (SD)</th>
<th>Insecure M (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-efficacy</td>
<td>83.0 (14.2)</td>
<td>59.0 (19.8)</td>
<td>89.2 (11.6)</td>
<td>88.1 (10.0)</td>
</tr>
<tr>
<td>Sensitivity (5 m)</td>
<td>13.2 (6.7)</td>
<td>8.0 (1.4)</td>
<td>12.5 (4.7)</td>
<td>13.7 (6.2)</td>
</tr>
<tr>
<td>Intrusiveness (5 m)</td>
<td>6.0 (8.2)</td>
<td>11.5 (4.9)</td>
<td>5.5 (4.3)</td>
<td>5.0 (4.4)</td>
</tr>
<tr>
<td>Sensitivity (10 m)</td>
<td>19.4 (1.8)</td>
<td>12.0 (4.2)</td>
<td>16.3 (4.4)</td>
<td>14.3 (4.3)</td>
</tr>
<tr>
<td>Intrusiveness (10 m)</td>
<td>3.3 (2.8)</td>
<td>5.5 (7.8)</td>
<td>4.3 (3.0)</td>
<td>5.4 (4.4)</td>
</tr>
<tr>
<td>Anxiety</td>
<td>26.6 (5.1)</td>
<td>24.5 (3.5)</td>
<td>23.7 (4.4)</td>
<td>22.9 (4.7)</td>
</tr>
<tr>
<td>Cry responsiveness</td>
<td>33.8 (3.0)</td>
<td>29.5 (3.5)</td>
<td>29.5 (4.4)</td>
<td>28.4 (4.5)</td>
</tr>
</tbody>
</table>
previously (Stifter & Braungart 1992) mothers of colic infants were similar to mothers of non-colic infants on their observed measures of sensitivity and intrusiveness at 5 and 10 months. When we examined these variables based on the colic infants’ attachment classification, a pattern emerged which mirrors the effect we found for maternal self-efficacy. That is, mothers of infants who had colic and then went on to develop insecure attachments were less sensitive and more intrusive at 5 months than the other groups of infants (see Table 2). Interestingly, those differences disappeared by 10 months of age.

Further, to eliminate the possibility that the mothers of insecurely attached colic infants had predisposing characteristics that may have influenced the development of attachment regardless of whether their infants had colic, we also went back to our previously reported data on maternal personality and self-reported cry responsiveness (see Stifter & Braungart 1992). There were no differences to suggest that either of these characteristics influenced attachment classification. Mothers of infants with colic and insecure attachments were no more anxious or less responsive to crying than mothers of secure infants (colic or non-colic) or mothers of non-colic/insecure infants.

**Discussion**

The aim of the present study was to examine the short and long-term effects of infant colic on mothers and their relationships with their infants. Caring for an infant with colic can be very stressful for parents. Our results suggest that this stress may have a negative effect on how the mother views herself in the maternal role. Mothers of infants who developed colic rated themselves as less competent than mothers of infants who did not have colic. This finding, however, is not surprising when one considers the intensity and duration (averaging 90 min/bout; Stifter & Braungart 1992) of crying exhibited by infants with colic. Such feelings may be compounded by the fact that colicky infants are generally inconsolable. The ability to respond with success to an infant’s needs is the basis of maternal self-efficacy. When attempts to soothe an infant are met with failure then feelings of incompetence are likely to develop. Indeed, in an experimental study Donovan and Leavitt (1985) found that when mothers could not control the crying of an infant they reported feeling frustrated and helpless, feelings which may negatively impact one’s sense of competence.

Mothers of infants who had developed colic also reported that they were somewhat more anxious when separated from their infants than mothers of non-colic infants. What is interesting about this result is that they reported feeling this anxiety approximately 2 months after their child’s colic had ceased.
This finding may be due to their perceptions of their child as more vulnerable (Forsyth & Canny 1991) and thus requiring their protection. In addition, mothers of colic infants may think that only they are capable of caring for their own child. However, our data also revealed that mothers of colic infants felt that separation had a positive effect on their child in that it encouraged independence and sociability. That is, mothers of colicky infants agreed more often with such statements as ‘my child needs to spend time away from me in order to develop a sense of being an individual in his/her own right.’ One possible explanation is that mothers whose infants had colic felt that because their child ‘survived’ this stressful condition, he/she may have learned to be more self-reliant. Thus, it appears that mothers of infants who had colic are conflicted about their needs to be with the child and their belief about the child’s ability to adapt to separations and benefit from them.

Whereas our data on maternal perceptions of efficacy and separation anxiety identify the short-term effects of excessive crying, they do not speak to its long-term consequences as these measures were taken soon after their infants’ colic had resolved. Once mothers have had time to experience effectiveness in alleviating the distress of their now non-colic infant they may begin to feel more confident in their parenting skills. Likewise, mothers may feel less anxious about being away from their child when they’ve had more positive experiences leaving their child in the care of others. Our data on the attachment relationship that developed between mothers and colic infants suggest that this may be true. Infants with colic were not more likely to develop insecure attachments. On the contrary, the percentage of secure colic infants was slightly above the norm found by Ainsworth et al. (1978) and duplicated by other American and European studies (see van Ijzendoorn & Kroonenberg 1988). In addition, the finding that mothers of colic infants were no different than mothers of non-colic infants in their sensitivity to infant cues in two separate studies (Stifter & Braungart 1992; St. James Roberts et al. 1996) supports this hypothesis. On a cautionary note, however, our post hoc analysis suggests that if the mothers’ self-efficacy is severely affected by having an infant with colic then a more negative outcome in the form of an insecure attachment may result. Mothers of the only two colic infants classified as insecure/resistant rated themselves as the least competent and were observed to be less responsive to their 5-month-old infants. While the size of our sample was too small to make any firm generalizations, our data do suggest that some mothers of infants who cry excessively may be at risk for troubled relationships. Indeed, several studies have indicated that low maternal self-efficacy in conjunction with difficult infants can lead to depression and low behavioural competence (Cutrona &
Troutman 1986; Teti & Gelfand 1991), two measures linked to the development of an insecure attachment (see Teti et al. 1995). Clearly, more research is needed to confirm this hypothesis.

In sum, our findings revealed that having a child who develops colic has some limited short-term effects on a mother’s feelings about herself and her anxiety about separating from her child. We also found no differences in attachment classification between infants who had colic and those who did not suggesting that maternal feelings of self-efficacy and separation anxiety do not persist or that these mothers did not allow these feelings to affect her interactions with her infant. A note of caution is in order about these conclusions. The results of the present study were based on a very small sample of infants with colic drawn from a highly educated, middle class sample and thus we may not have had enough power to predict important differences. As our sample was studied prospectively and we did not rely on parents’ reports of ‘colic’ we feel confident that the differences that were found were due to the effects of this stressful, temporary condition, and not due to any parental characteristics that may have affected the outcome measures. However, the characteristics of the sample may have influenced the outcome thus limiting the generalizability of the results.

Finally, our data tentatively suggest that some mothers whose infants develop colic may be especially vulnerable to feelings of inadequacy and consequently are at risk for developing insecure attachments. Pediatricians and practitioners should be sensitive to this possibility and be reassuring to parents that infant colic is not the result of their poor parenting skills.

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**References**


