

## **Early Infant Crying: Child and Family Follow-up at Three Years**

**M. Ruth Elliott, Elaine L. Pedersen,  
and Judith Mogan**

Des enfants qui, lorsqu'ils étaient âgés de six à huit semaines, pleuraient de manière excessive, furent soumis à un examen vers les âges de deux à quatre ans, dans le but d'évaluer les effets à long terme des ces pleurs («coliques») sur l'évolution du comportement, sur les rapports parents-enfants, et sur la dynamique familiale. On a remarqué que plus les pleurs étaient fréquents lors de la période initiale, plus nombreuses étaient, trois ans plus tard, les perturbations signalées à l'intérieur de la famille ( $n = 0,29$ ). Les analyses démontrent aussi qu'ultérieurement, ce comportement n'a que peu d'influence sur le développement de l'enfant concerné. Aucun effet significatif durable sur la famille n'a été détecté. Il n'y a donc pas lieu pour les familles jouissant de ressources financières et sociales suffisantes de s'inquiéter : les problèmes suscités par les pleurs excessifs d'un nouveau-né peuvent se résorber avec le temps.

Children who cried excessively at six to eight weeks of age were re-examined at two to four years of age to determine the enduring effects of excessive crying ("colic") on behavioural development, parent-child interaction, and family functioning. The more crying in early infancy, the more family disruptions occurred three years later ( $r = .29$ ). Analyses showed that early crying had little impact on the children's later behavioural development. No significant major lasting effects on the family related to the infant's early crying behaviour were found. Families with sufficient social and economic resources can be reassured that problems related to early infant crying can be ameliorated over time.

Crying, the primary means by which infants communicate with their caregivers, serves the evolutionary purpose of infant survival. Fundamental exchanges between the infant and his or her immediate environment (such as is involved in becoming socialized and obtaining food and care) are regulated by crying (Lester, 1985; Newton, 1983), which has powerful effects, eliciting strong emotions from the caregiver — who is most often a parent (Murray, 1979). Because there is some evidence that infant crying, especially excessive crying, may have lasting effects on parent-offspring interaction (Bell & Ainsworth, 1972; Goldsmith, Bradshaw, & Rieser-Danner, 1986; Moss & Robson, 1968;

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*M. Ruth Elliott, Ph.D., R.N., is Professor, and Elaine L. Pedersen, M.N., R.N., is Research Associate, in the Faculty of Nursing at the University of Alberta, Edmonton. Judith Mogan, B.Sc.N., M.A., is Research Associate at the University of British Columbia, Vancouver.*

Shaw, 1977), this study focused on the possible enduring effects of early infant crying on the children and their families. Our purpose was to determine whether the amount of infant crying at six to eight weeks is predictive of later problems with child behaviour, parent-child interaction, or family functioning.

## Literature Review

### *Crying Behaviour in Infancy*

Although infants exhibit considerable variability in their crying behaviour (Weissbluth, 1989), important commonalities do exist. In industrialized countries the pattern for normal infants is that crying peaks to about 2  $\frac{3}{4}$  hours a day at six weeks and then decreases to approximately one hour a day at four to 12 months (Barr, 1990; Brazelton, 1962; Golton & St. James-Roberts, 1991; Hunziker & Barr, 1986; Wessel, Cobb, Jackson, Harris, & Detwiler, 1954). Still, in these countries 10–40% of infants suffer “three-month colic” or cry excessively (Illingworth, 1954; St. James-Roberts & Halil, 1991; Wessel et al.). Keefe (1988) observes that infant crying must be appropriately interpreted if parent-infant interaction is to be successfully negotiated.

### *Effects on the Infant*

Depending upon its intensity and duration, crying can place an infant at risk. In addition to harmful physiological effects, such as obstruction of venous return in the inferior vena cava leading to hypoxemia and intracranial hemorrhage (Anderson, 1989), heightened crying may contribute to a maladaptive mother-infant relationship (Thoman, Acebo, & Becker, 1983). In a study of 20 mother-infant pairs at two, three, four, and five weeks of age, high levels of interactional stability, a measure of consistency in the mother-infant relationship, were found to be related to low levels of social crying but not to crying in other contexts (during feeding, changing, or bathing or when the infant was alone). Because social crying took up less than 2% (five minutes) of the seven-hour day, the investigators concluded that this small (crying) component was a potent expression of the integrative processes involved in maintaining overall stability of the system. Elliott (1984) found that the amount of infant crying at four months, but not at one month, was associated with less than optimal parent-infant interaction, an unstimulating environment for the infant, and negative parental perceptions of the infant.

### *Effects on the Caregiver*

Excessive crying has been found to affect parents negatively (Carey, 1990, 1992; Keefe, 1988). Parents of excessive criers have reported feeling overwhelmed (Keefe & Froese-Fretz, 1989), stressed, and negative toward their infant (Wilkie & Ames, 1986). They described feeling incompetent (Beebe, Casey, & Pinto-Martin, 1993), helpless, rejected (Korner, 1974), depressed (Korner; Mayberry & Affonso, 1993; Whiffen, 1990; Wilkie & Ames), lacking confidence in their caretaking abilities and were irritable, depressed, and unresponsive to their infant (Williams, Painter, Joy, & Davidson, 1980).

### *Enduring Effects*

Sroufe (1996) notes that "many infants participate in well-regulated relationship systems and become effective in explicitly using the caregiver to modulate tension" and "are later able to manage impulses and feelings flexibly, as well as to maintain organized behaviour in the face of high states of tension, when, as young children, they operate more apart from caregivers." Sroufe states that "the secure infant-caregiver relationship, which promotes the capacity for self-modulated arousal, has its roots in the range of affective exchanges throughout early infancy." This includes the repeated arousal escalation and de-escalation in dyadic interaction (Sroufe, 1996), the frequently repeated distress-relief cycles with which the caregiver is associated (Lamb, 1981), and the continued experiences of positive affect. The roots of individual differences in the self-regulation of emotion lie within the distinctive patterns of dyadic regulation (Sroufe, 1989).

Problems in parent-infant attachment associated with infant crying may begin in the first month of life (Bell & Ainsworth, 1972; Moss & Robson, 1968) and continue into the infant's second year (Bell & Ainsworth; Goodman Campbell, 1979; Shaw, 1977). These findings support the conclusion of Ainsworth, Blehar, Waters, and Wall (1978) that patterns of parent-infant interaction, even in the first three months, may predict patterns of subsequent attachment behaviour, such as promptness of response to infant crying. Acebo and Thoman (1992) found the structuring of a mother-infant relationship to be reflected in the amount of crying that occurred while mother and infant were in close physical contact but not while there was no physical contact. Thomas and Chess (1977) interviewed urban, middle-class parents and recorded their comments ( $N = 138$ ) over time. Infant fussiness was a major concern, along with ease of feeding, regularity of sleep, fearfulness, and reciprocity. They reported that "psychological characteristics

cannot be expected consistently to show linear continuity over time" (p. 266). Further, patterns of temperamental difficulty may be associated with environmental instability.

Negative effects of infant temperament, particularly infant distress, on later parent-infant attachment have been reported by Belsky, Rovine, and Taylor (1984) and Goldsmith et al. (1986). Several studies (Cutrona & Trautman, 1986; Mayberry & Affonso, 1993) have found that infants with more difficult temperaments had parents who were more depressed. Koniak-Griffin and Verzemnieks (1994) studied 49 mother-child dyads for the role of temperament in infancy, subsequent child behaviour problems, and mother-infant interaction. Their results suggest that continuity of infant temperament rating is an important factor in subsequent maternal identification of behaviour problems in toddlers, but that difficult temperament alone may not predict such problems. The child's early development may therefore be negatively affected in an environment in which the major caregiver is depressed or less than optimally responsive.

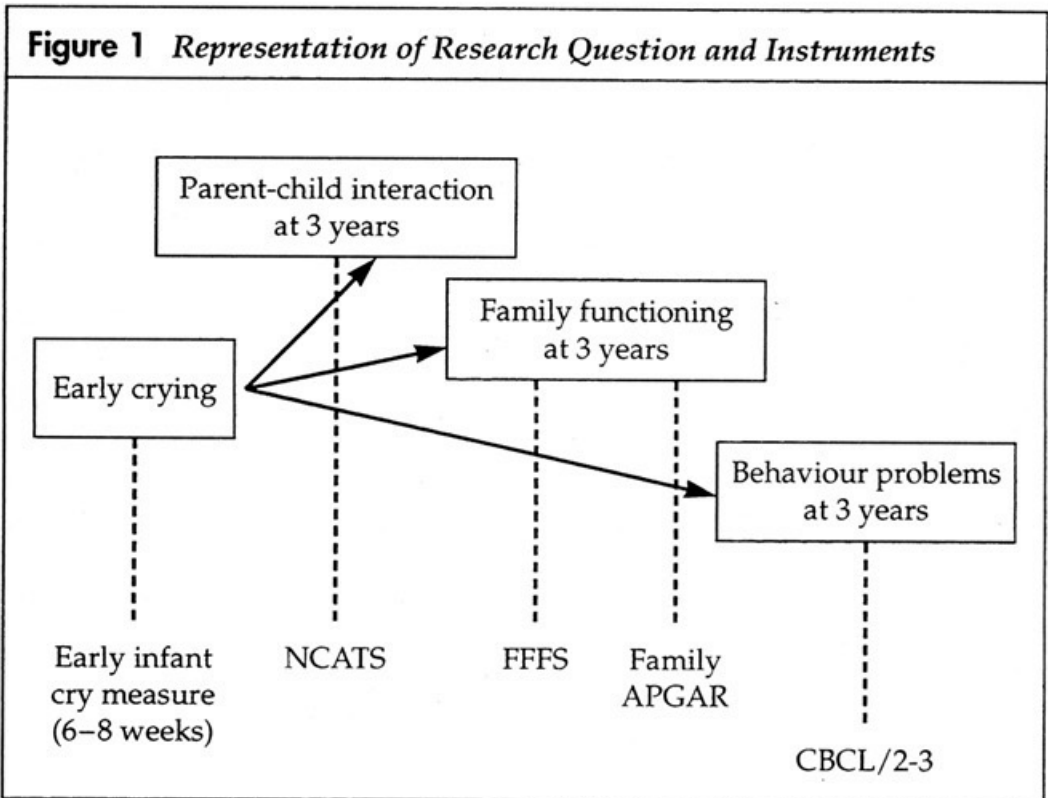
Hammond, Bee, Barnard, and Eyres (1983) link excessive crying in infancy to decreased cognitive performance in eight-year-olds. In contrast, Stifter and Braungart (1992) report no lasting effects. Pinyerd and Zipf (1989) hold that neither the short-term nor long-term consequences of infant "colic" have been adequately explored.

While the evidence remains inconclusive about the long-term effects of early infant crying on the family, Keefe and Froese-Fretz (1991) point out that "only a few studies address the impact of an irritable infant on family dynamics." Thompson, Harris, and Bitowski (1986) report that excessive infant irritability represents a crisis situation, with ramifications for the parent-infant relationship, the marriage, and family dynamics, while St. James-Roberts (1989) states that the effect of crying on parent-infant interaction is the most pressing issue. Rautava, Lehtonen, Helenius, and Sillanpaa (1995) found that families of colicky infants demonstrated more dissatisfaction, three years later, with arrangement of day-to-day family responsibilities, amount of leisure time, and number of shared activities. Researchers have established strong relationships between specific elements of early caregiver-infant interaction and the child's qualities and skills later in life. High-quality interactions early in the infant's development have been linked to intellectual and language abilities and more secure attachments to major caregivers (Sumner & Spietz, 1995).

### Research Question

The children in this study, some of whom cried excessively as infants, were involved in crying studies when they were six to eight weeks of age (Elliott, Fisher, & Ames, 1988). All were healthy, term infants from healthy, intact families. In this follow-up study, the children and their families were re-examined when the children were between two and four years old.

The following research question guided the study: Is infant crying at six to eight weeks of age associated with parent-reported child behaviour problems, parent-child interaction, or family functioning? Figure 1 illustrates the research question and its relationship to the measurement tools.



### Method

#### *Sample*

Parents of 118 infants (67 males and 51 females) who had taken part in previous cry-related studies (1986, 1987) at the Infant Development Research Laboratory of Simon Fraser University, Vancouver, were sent a letter describing the follow-up study. Of the original sample, 82 (70%) agreed to participate. Initially, these families had been recruited from



postpartum units at the Greater Vancouver hospitals that offered maternity services. Upon the infant's discharge, stamped, pre-addressed postcards were distributed to each family, requesting their participation as volunteers in one of the university's ongoing studies of child development. Newspaper and television advertisements were also placed. Parents provided informed, written consent for their child to participate. The final sample included 45 males and 37 females who were now between two and four years of age ( $M = 3.8$ ,  $SD = 0.65$ ). Subjects were largely from intact, two-parent families (84%). About 10% of the sample parents reported being separated and 5% were divorced. There was one single parent.

### *Instruments*

The *Cryscore*, a single composite measure of crying, was established for each infant at six to eight weeks of age. This score was based on the caregiver's responses to three questions in a questionnaire developed in 1983 by Dr. E. Ames of the Infant Development Research Laboratory: (1) "Approximately how many times a day does your baby cry?" (2) "How long does the single, longest crying episode last each day?" (3) "How long does the average crying episode last?" In three previous studies, the variables showed satisfactory intercorrelations (from  $r = .20$  to  $r = .61$ ), with mothers and fathers responding similarly to the questions about their infant's crying (Ames & Bradley, 1983; Elliott, 1985; Wilkie & Ames, 1986). The Cryscore was used to distinguish the normal criers from the excessive criers according to Wessel et al.'s (1954) definition of excessive crying (three or more hours per day, three or more days per week, during three or more weeks in the first three months of life). This measure was the independent variable used in all the analyses to categorize the children and to determine whether relationships could be found by the selected study measures.

The *Child Behavior Check List [for ages] 2-3* (CBCL/2-3) (Achenbach & Edelbrock, 1986) is designed to record child behavioural problems as reported by the caregivers. This standardized scale has been used on a large population of both normal and clinically referred children, with demonstrated test-retest reliability of .87 at one week. The CBCL/2-3 discriminates between children referred for mental health services and non-referred children, showing good construct validity (Speer & Sachs, 1985). Achenbach (personal communication) approved its use with the four-year-old children in this study.

The *Nursing Child Assessment Teaching Scales* (NCATS) (Barnard & Eyres, 1979) measures parent-child interaction at two to four years of

age. Since the NCATS teaching tasks have been standardized only for children up to three years, we used standardized teaching tasks from Beery (1967) for the children over three. The NCATS has been tested widely and has a reported internal consistency of .83 (mother total scores) and .60 (child total scores). Test-retest reliability is .45 to .65 (mother items) (Sumner & Spietz, 1995). Construct validity has been reported in differentiating between abusing and non-abusing mothers (Barnard et al., 1989). The NCATS researchers achieved interrater reliability scores of at least 85% and obtained a Certificate of Reliability from the NCAST National Register (Sumner & Spietz).

Two tools were selected to measure family functioning from the perspective of the infant/child's immediate environment.

The *Feetham Family Function Survey* (FFFS) (Roberts & Feetham, 1982) is a 27-item questionnaire designed to evaluate relationships within the family as well as between the family and the social environment, by examining discrepancies between "what is" and "what should be" using the Porter format (Porter, 1962, 1963a, 1963b). The Porter format allows for an indirect measure, or discrepancy score (a-b), from two direct measures, which is converted to an absolute score and provides an indirect measure of satisfaction with the activity inherent in each item, such as amount of time spent with spouse. The FFFS has a test-retest reliability at two weeks of -.85 and an internal consistency of .66 to .84 (Speer & Sachs, 1985). Construct validity has also been reported (Roberts & Feetham).

The second tool used to assess family functioning, the *Family APGAR* (Smilkstein, 1978), was selected because of its ease of administration and its conceptual consistency with other study measures. The Family APGAR has demonstrated construct validity in differentiating adjusted from maladjusted families (Smilkstein, Ashworth, & Montano, 1982). Good, Arons, Good, Shaffer, and Smilkstein (1979) report internal consistency for item/total -.24 to .67; split half -.93. Test-retest reliability of .83 has been reported (Good et al.; Smilkstein et al.).

Families also completed a subject information sheet (SIS), which included demographic information, general questions about the health of the child and the family since the child's birth, number and type of family disruptions, and the caregiver's rating of the child's temperament. The question concerning temperament was originally used in a questionnaire developed by Ames (1983) and reported by Ames, Gavel, Khazaie, and Farrell (1985). Caregivers were asked to classify their three-year-old child as temperamentally "easygoing," "average," or "highstrung."

### *Procedure*

In the follow-up study, parents were visited at home and asked to complete the CBCL/2-3, APGAR, FFFS, and SIS. Care was taken to present the study as an investigation on the child's *overall* development since early infancy, without specific reference to crying behaviours. Mothers and fathers were asked to complete all measures independently and to return them by mail. Reminder telephone calls were made when data had not been received. Eighty-two mothers and 78 fathers completed the questionnaires. During home visits, the trained researchers, using the NCATS, observed and recorded 81 mother-child teaching episodes.

### *Analysis*

Data from the completed questionnaires were analysed using SPSS for Windows Release 6.0 software (Norusis, 1993). Power analysis was completed to confirm the suitability of the proposed sample size (Cohen, 1977). With calculations based on a significance level of  $p \leq .01$  and a medium effect size, a sample of 100 was expected to provide a 76% chance of illustrating a significant association, if there was one. The follow-up sample was compared with normed data where available.

## **Results**

Unless otherwise stated, all results are reported at the  $p \leq .05$  level of significance. Using the Cryscore measure, 10 (12%) of the 82 children in the study had been categorized as excessive criers at six to eight weeks of age, while the remaining 72 (88%) were normal criers ( $M = 3.97$ ,  $S = 2.63$ ). No significant differences in sex distribution or parental marital status between the normal group and the excessive crying group were found.

At two to four years of age, the child's major caregiver was the mother in 68 cases (83%) and the father in two cases; the role was shared or played by "other" in 12 cases (15%). The major caregiver was defined as the person who provided care for the majority of the child's waking hours.

No significant differences were found between the normal crier group and the excessive crier group, and their families, with respect to health. Seventy percent of the parents ( $n = 57$ ) reported no major child (subject) health problems, 22% ( $n = 18$ ) reported one problem, and 8% ( $n = 7$ ) reported two or more problems. The most frequently cited child



health problems were urinary tract or upper respiratory tract infections and chickenpox. Sixty percent of families ( $n = 49$ ) reported no other family health problems, 23% ( $n = 19$ ) reported one problem, and 17% ( $n = 14$ ) reported two or more problems; some of the most frequently reported problems were allergies, herniated disc, chronic back problems, gynecological problems, and alcoholism/codependency.

The CBCL/2-3 was administered to address the question of whether infant crying at six to eight weeks of age is associated with parent-reported child behaviour problems at two to four years of age. Results showed no relationship between early Cryscores and mother-reported total child behaviour problems at two to four years ( $t = 0.61$ ,  $df = 80$ ) (Table 1). There was no significant difference between scores of the crying groups and Achenbach's (1992) non-referred sample ( $t = 1.05$ ,  $df = 401$ ), although there were significant differences when the normal criers' and the total criers' scores were compared with Achenbach's clinically referred sample scores. It is interesting to note that scores of the excessive crier group, when compared with Achenbach's referred sample, approached statistical significance ( $t = 1.94$ ,  $df = 329$ ).

To investigate whether infant crying at six to eight weeks was associated with parent-child interaction at two to four years,  $t$ -tests were used to compare parent and infant subscale scores and total scores on the NCATS with early infant crying scores (Table 2). Although the Sensitivity to Cues and Response to Distress subscales resulted in significant  $t$  values, further non-parametric analysis revealed that the distributions were not normal, rendering the results meaningless. No significant differences were seen between the normal criers and the excessive criers for any of the NCATS subscales. This suggests that parent-child dyads whose infants cry excessively at six to eight weeks and parent-child dyads whose infants cry a normal amount do not differ in their interactions when the child is two to four years of age.

When data were compared against the NCATS Database (Sumner & Spietz, 1995),  $t$ -tests revealed significant differences between the follow-up sample and the database for many of the subscales, but not for the Parent Total Score or NCATS Total Score (Table 2). Both mother and child contingency scores (items on the NCATS that specifically deal with reciprocal dyadic interaction between caregiver and child) were found to differ significantly from the database scores. Mothers' mean contingency scores in the follow-up sample were higher than those in the database, while the children's mean contingency scores in the follow-up sample were lower than those in the database.

**Table 1** *Child Behavior Check List 2-3*

Summary Statistics and *t*-test of Difference in Means between (1) Infant Follow-up Sample (Normal and Excessive Criers) and (2) Infant Follow-up Sample (Normal, Excessive, and Total Criers) and Norms (Achenbach's Non-referred and Clinically Referred Samples)

Tools	# of Children	Mean	Standard Deviation	Difference	<i>t</i> Value	Degrees of Freedom	<i>P</i>
<b>Child behavior profile (CBCL/2-3)</b>							
<b>Total Behavior Problems</b>							
<b>1. Infant Follow-up Sample</b>							
(a) Normal Criers	72	35.25	44.59				
(b) Excessive Criers (compared with Normal)	10	44.20	32.36	8.95	0.61	80	0.54
(c) Total Criers	82	39.73	38.48				
<b>2. ~Achenbach's Non-referred Sample</b>							
(a) compared with Normal Criers	321	33.80	19.90	1.45	0.27	391	ns
(b) compared with Excessive Criers				10.40	1.02	329	ns
(c) compared with Total Criers				5.93	1.40	401	ns
<b>3. +Achenbach's Referred Sample</b>							
(a) compared with Normal Criers	321	64	26.60	28.75	5.47	391	≤0.05
(b) compared with Excessive Criers				19.80	1.94	329	ns
(c) compared with Total Criers				24.27	5.71	401	≤0.05
~ From raw scores, Achenbach's sample of non-referred (normal) children (Achenbach, 1992) + From raw scores, Achenbach's sample of clinically referred children (Achenbach, 1992) * <i>t</i> value shows significant difference if $t \geq 1.96$ , $p \leq .05$ ns = no significant difference ( <i>p</i> values reported where available)							

**Table 2** *NCAST Teaching Scale, Feetham Family Functioning Survey, and Family APGAR*Summary Statistics and *t*-test of Difference in Means between (1) Normal and Excessive Criers and (2) Total Follow-up Sample (Total Criers) and Norms (where available)

Tools	# of Children	Mean	Standard Deviation	Difference	<i>t</i> Value	Degrees of Freedom	<i>P</i>
<b>NCAST Teaching Scale (NCATS)</b>							
<b>A. Sensitivity to Cues Subscale</b>							
1. Normal Criers	71	9.49	1.13				
2. Excessive Criers (compared with Normal)	10	10.30	0.68	0.81	2.19	79	0.03
3. Total Criers	81	9.12	0.71				
4. NCATS Database (norm) (compared with Total)	2123	9.38	1.57	0.26	3.30	2202	≤0.05
<b>B. Response to Distress Subscale</b>							
1. Normal Criers	71	10.96	0.26				
2. Excessive Criers (compared with Normal)	10	10.60	1.27	0.36	2.14	79	0.04
3. Total Criers	81	10.78	0.77				
4. NCATS Database (norm) (compared with Total)	2123	10.20	1.60	0.58	6.77	2202	≤0.05
<b>C. Social Emotional Growth-Fostering Subscale</b>							
1. Normal Criers	71	8.72	1.29				
2. Excessive Criers (compared with Normal)	10	8.50	1.08	0.34	0.51	79	0.61
3. Total Criers	81	8.61	1.19				
4. NCATS Database (norm) (compared with Total)	2123	9.22	1.69	0.61	4.61	2202	≤0.05
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<b>D. Cognitive Growth-Fostering Subscale</b>							
1. Normal Criers	71	13.06	2.57				
2. Excessive Criers (compared with Normal)	10	13.20	1.69	0.14	0.17	79	0.86
3. Total Criers	81	13.13	2.13				
4. NCATS Database (norm) (compared with Total)	2123	12.93	3.31	0.20	0.85	2202	ns
<b>E. Clarity of Cues Subscale</b>							
1. Normal Criers	71	7.28	1.11				
2. Excessive Criers (compared with Normal)	10	7.70	1.16	0.42	1.11	79	0.27
3. Total Criers	81	7.49	1.14				
4. NCATS Database (norm) (compared with Total)	2123	8.08	1.47	0.59	4.68	2202	≤0.05
<b>F. Responsiveness to Parent Subscale</b>							
1. Normal Criers	71	6.54	2.14				
2. Excessive Criers (compared with Normal)	10	6.6	1.27	0.06	0.09	79	0.93
3. Total Criers	81	6.57	1.71				
4. NCATS Database (norm) (compared with Total)	2123	7.73	3.16	1.16	6.10	2202	≤0.05
<b>NCATS Parent Total Score</b>							
1. Normal Criers	71	42.23	3.87				
2. Excessive Criers (compared with Normal)	10	42.60	2.37	0.38	0.30	79	0.77
3. Total Criers	81	42.26	3.67				
4. NCATS Database (norm) (compared with Total)	2123	41.73	6.45	0.53	1.30	2202	ns
<b>NCATS Parent Contingency Score</b>							
1. Follow-up Study Mother Contingency	81	17.86	1.85				
2. NCATS Database Mother Contingency	2123	16.71	3.50	1.15	5.59	2202	≤0.05
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<b>NCATS Child Total Score</b>							
1. Normal Criers	71	13.82	3.07				
2. Excessive Criers (compared with Normal)	10	14.30	1.64	0.48	0.49	79	0.63
3. Total Criers	81	13.85	2.87				
4. NCATS Database (norm) (compared with Total)	2123	15.71	4.24	1.86	5.83	2202	≤0.05
<b>NCATS Child Contingency Score</b>							
1. Follow-up Study Child Contingency	81	5.83	1.93				
2. NCATS Database Child Contingency	2123	6.94	2.95	1.11	5.18	2202	≤0.05
<b>NCATS Total Score</b>							
1. Normal Criers	71	56.03	5.62				
2. Excessive Criers (compared with Normal)	10	56.90	2.99	0.87	0.48	79	0.63
3. Total Criers	81	56.47	4.31				
4. NCATS Database (norm) (compared with Total)	2123	57.44	8.74	0.97	1.02	2202	ns
<b>Feetham Family Functioning Survey</b>							
Family Discrepancy Score							
1. Normal Criers	72	22.14	11.16				
2. Excessive Criers	10	23.90	11.60	1.76	0.47	80	0.64
<b>Family APGAR</b>							
Total Score							
1. Normal Criers	72	8.78	1.93				
2. Excessive Criers	10	8.0	2.11	0.78	0.57	80	0.57
* <i>t</i> value shows significant difference if $t \geq 1.96$ , $p \leq 0.05$ ns = no significant difference ( <i>p</i> values reported where available)							



Analysis of the total discrepancy scores of the FFFS was carried out to determine whether infant crying at six to eight weeks was associated with family functioning at two to four years. This revealed no differences between the two groups of families. No significant differences were noted between mothers' and fathers' scores when the two groups of criers were compared. However, results revealed a greater discrepancy for mothers between "what is" and "what should be" regarding the amount of help from relatives and friends with family tasks such as care of children, house repairs, household chores, etc. Mothers were shown to be more dissatisfied ( $M = 8.33$ ,  $SD = 1.9$ ,  $Range = 0-10$ ) than fathers ( $M = 5.89$ ,  $SD = 3.96$ ,  $Range = 0-10$ ). These discrepant scores correlated positively with the number of child health problems ( $r = .27$ ) and major family disruptions ( $r = .27$ ).

Results from the Family APGAR showed no significant differences in any of the family interaction and support items when families of early excessive criers were compared with families of normal criers.

Major family disruptions were reported on the SIS by 44% of the families ( $n = 36$ ). The number of reported family disruptions showed a significant positive relationship with the Cryscore of the child ( $r = .29$ ). The families of excessive criers reported more major family disruptions (such as divorce or death of a grandparent) by the time the child was two to four years than did the families of normal criers.

## Discussion

This follow-up study of child and family characteristics related to early infant crying behaviours found no major lasting effects on the child, the family, or parent-child relationships, apart from mothers' dissatisfaction with the amount of help they received from their spouses and friends. Rautava et al.'s (1995) findings of more dissatisfaction with arrangement of day-to-day family responsibilities, leisure time, and shared activities were surprisingly similar to ours. We surmise that patterns of responding to daily tasks may well be influenced early on by time constraints imposed by an excessive crier. The majority of our results supported those reported by Stifter and Braungart (1992). We attribute this in part to the volunteer nature of our study population. Most of the subjects were partnered, reasonably healthy, middle- to upper-middle-class Caucasian families. In addition, they proved highly committed to this follow-up study, as evidenced by an impressive follow-up rate of 70% of the original sample from three years earlier. Families with fewer problems and more supportive, stable environments (as was the case

with the participants in this study) are better equipped to meet developmental challenges.

Comparison of our results on the CBCL/2-3 with those of Achenbach's (1992) normal (non-referred) sample revealed no differences between groups ( $t = 1.05$ ,  $df = 401$ ). Scores for the excessive crier group did not differ significantly from Achenbach's clinically referred sample, although they approached clinical significance. This latter finding is intriguing and invites further detailed analyses of our results using the Achenbach tool. However, the findings suggest that our total sample, comprising both normal and excessive criers, likely represents a normal population. Future longitudinal research should include a larger, randomized controlled trial, to determine whether long-term effects of excessive crying persist, particularly in a population of reduced psychosocial and environmental assets.

An examination of our NCATS results comparing excessive crier and normal crier groups revealed that later parent-child interaction was not compromised. The groups did not differ in responsiveness to their distressed child. These findings are inconsistent with those of Bell and Ainsworth (1972) and Shaw (1977), who found later decreased parental responsiveness, although their subjects were younger (up to 12 months and 14 months, respectively). Our results showed higher mean contingency scores for mothers, but lower mean scores for children, when compared with the NCAST database. Other differences were mixed. These results may reflect cultural and/or socioeconomic differences between samples. For example, Sumner and Spietz (1995) found consistent differences among ethnic groups. After controlling for mother's education and child's age, their Mother, Child, and Total Teaching Scores were higher for Caucasian dyads ( $N = 963$ ) than for African-American ( $N = 467$ ) and Hispanic dyads ( $N = 311$ ).

Abundant research evidence supports the claim that infant crying, especially excessive or "colicky" crying, is a risk factor in the early post-partum months. With sufficient and effective family resources, the long-lasting negative effects of crying can be forestalled. Our sample of 85% two-parent, educated families was able to cope with infant crying. When resources are not available, or when the family's psychosocial assets are limited (such as in the case of single parents with limited finances), such a combination of risks could pose a substantial threat to a developing "reciprocal, symbolic interaction that is realized through behaviours that indicate a nurturing commitment on the part of the parent and a loving-like response from the infant" (Thompson et al., 1986).

Our findings are consistent with those of Stifter and Braungart (1992), who studied parents' ratings of infant temperament and found that colicky and comparison infants were similar, by the age of five and 10 months, in terms of both behaviours exhibited in the laboratory and behaviours rated by mothers. We found no significant differences between groups of criers in temperament ratings by parents of three- to four-year-olds. We identified a tendency for more children rated by their parents as "highstrung" to be in families reporting more disruption. This poses the question: Are "highstrung" infants *reflecting* the emotional climate in which they are reared, or are they *contributing* to a less ordered family environment? This question invites more longitudinal research.

### *Clinical Implications*

Although we found few lasting problems connected with early excessive infant crying, these results may not apply to all family situations. Most parents continue to express extreme anguish when their attempts at soothing are unsuccessful. We recommend that parents of excessive criers be identified and supported as an integral part of follow-up health care, to offset the possibility of continuing unresolved, unhealthy parent and family behaviours. Families with reduced psychosocial assets, such as limited knowledge or support or financial problems, where major family disruptions or child health problems co-exist, are particularly vulnerable. Offering help in applying more effective soothing techniques directed at increasing their infant's control of his or her own arousal should be part of all parent-information sessions in the perinatal period.

On a positive note, parents of excessive criers can be reassured that infant crying decreases with age and that long-term outcomes, reflected in child behaviours, interaction between caregiver and child, and family functioning, are not likely to be compromised.

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Requests for reprints should be sent to M. Ruth Elliott, Ph.D., R.N., Faculty of Nursing, Clinical Sciences Building 5-111, University of Alberta, Edmonton, AB T6G 2G3.

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