

CRYING BEHAVIOUR

Crying Behaviour and its Impact on Psychosocial Child Development

Cynthia A. Stifter, PhD, Penina Backer, BS, MA

Pennsylvania State University, USA

March 2017, Éd. rév.

Introduction

All infants cry and all cry for a reason. Indeed, the attributions applied to early infant crying range from pain to anger to boredom.¹ In the first months of life, crying is particularly salient as infants have relatively few effective methods of communicating their needs and states. Developmentally, crying in early infancy is distinguished by its temporal qualities. Several studies have demonstrated that infants typically show an increase in their crying across the first three months, with a peak at around 6 to 8 weeks of age.² Importantly, crying decreases significantly around 3 to 4 months of age, coinciding with important developmental changes in affect, non-negative vocalizations and motor behaviour. As crying is considered a normal communicative signal,³ developmental outcomes for children who cry within the normal range are not of concern. However, some infants exceed the typical pattern of crying, such as those who cry long, hard and inconsolably during the first three months or those who cry/fuss frequently beyond 3 to 4 months of age. It is these infants who are often believed to be “at risk” for developmental problems.

Subject

Unexplained, excessive or persistent crying in the first three months of life that occurs in an otherwise healthy infant is labelled “infant colic.”⁴ Colic can be found in approximately 10% of the population. The causes of colic are quite diverse and can be categorized as residing either in the infant or the parent-infant dyad. Only 5 to 10% of infants who cry excessively, however, are believed to suffer from some organic disease.⁵ A recent set of papers reviewing the evidence on the source of infant colic concluded that those infants who present with excessive crying and other symptoms of ill-health such as failure to thrive, vomiting, and diarrhea should be distinguished from infant colic and treated accordingly.⁶ For healthy infants, however, there is a growing consensus among researchers that infant colic is a developmental phenomenon involving individual differences in reactivity and regulatory function.^{7,8}

Shorter bouts of crying and fussiness that are more frequent and persist beyond 3 months of age are believed to be temperamentally based. Infants who possess these characteristics are termed either difficult, irritable, or negatively reactive. Temperament describes constitutionally-based and heritable individual differences in reactivity and regulation.⁹ Although temperament can be modified, it is considerably stable across the life span.¹⁰⁻¹³ And, because high negative reactivity represents an extreme case, it has been found to demonstrate significant continuity.¹⁴

Problem

The intense crying and inconsolability of an excessively crying or fussy infant creates a host of parental reactions and concerns about the behavioural development of the infant. Because negatively reactive temperament is relatively stable, it is proposed to have implications for more adverse, persistent outcomes than the transitory condition of colic. Nevertheless, this does not preclude colic’s effect on the family environment nor its long-term outcome.

Key Research Question

Whether infants cry intensely for a few months or fuss frequently for the first year of life, a systems approach to development would suggest that the impact of extremes in crying on the infants’ immediate environment may have negative consequences for the dynamics of the parent-child relationship, which in turn would have implications for the child’s psychosocial development. Thus, researchers have asked: Is the effect of early infant crying on later development direct, or is it indirect through interactions with the child’s early social partners?

Recent Research

Outcomes for infant colic. Longitudinal observations and parent ratings show that infants with colic may continue to be more negatively reactive shortly after the colic has resolved;¹⁵⁻¹⁹ however, long-term assessments of their temperament have revealed few differences.¹⁵⁻²⁰ Interestingly, this early difference in reactivity may be due to a delay in the development of regulatory strategies.¹⁷ Most longitudinal research report few long-term effects of infant colic. In two studies, mothers reported more negative emotional behaviour in their preschool-aged children who formerly had colic, although there were no differences in all other reported behaviour problems when compared to infants who did not have colic.^{20,21} Finally, several studies have also examined mental development in infants with colic and likewise have demonstrated no effect of colic.^{15,16,20,22} In one study, although differences on the Bayley MDI were revealed at six months, both groups were within the normal range, and no differences were found at 12 months of age.²³

As might be expected, the impact of infant colic is felt more by the parents, particularly mothers who have the burden of caring for the excessively crying child. Mothers reported more symptoms of psychological distress^{24,25} and low self-efficacy.^{26,27} And, although mothers report more depressive symptoms at the time their infants are experiencing colic,^{28,29} research on maternal depression 3 months after the remittance of infant colic is mixed.^{30,31} The distress mothers of colic infants report may arise out of their difficulties in soothing their infants as well as within their everyday dyadic interactions.³² The few studies to date that have examined the long-term consequences of having a colicky child, however, indicate that there are no negative outcomes for parent behaviour and, importantly, for the parent-child relationship. In two separate studies,^{15,16} mothers of colic and non-colic infants were observed to be alike in maternal sensitivity shortly after the colic resolved. These results may explain why infant who developed colic were on the parent-child relationship have been found. Infants who developed colic were no more likely to be insecurely attached than infants who did not have colic.²⁶

Outcomes for negatively reactive temperament. As with the research on the developmental effects of infants with colic, findings with regard to negatively reactive temperament and persistent crying (excessive crying that persists beyond the colic period) suggest that it influences more than the infant. The psychosocial outcome receiving the most attention from researchers is problem behaviour, with most studies finding perceived negative reactivity in infancy to predict problem behaviour in childhood^{33,34} and adolescent.³⁵ Specifically, infants prone to high levels of fear, frustration, and sadness, as well as difficulty recovering from such distress,

were found to be at increased risk for internalizing and externalizing problem behaviours according to parental and/or teacher report. Two things are important to note about these findings: (1) not every negatively reactive infant expressed behavioural problems later in life; and (2) both temperament and problem behaviours were, in most studies, rated by parents, raising the issue of respondent bias.

Research has also shown that infant negative reactivity may have immediate and long-term effects on parenting. Concurrent associations have been found between parents-reported infant negative emotionality and negative parenting, but only in studies of low socioeconomic status or minority families.³⁶ This pattern of findings suggests that, within the context of sociodemographic risk, negatively reactive infants may tax parental capacity for appropriate responsiveness to infant needs. Longitudinal findings highlight the bidirectional nature of such processes. In one study, observed infant negativity predicted declines in supportive parenting by toddlerhood, while harsh parenting during infancy predicted increased toddler negativity.³⁷ Similarly, another study found that maternal relationship stress was associated with concurrent infant negativity, which predicted slower emotion regulatory development across infancy, which in turn predicted negative parenting in toddlerhood.³⁸

The interactive effect of infant temperament and parent behaviour on child development has been explained by the "differential susceptibility model,"^{39,40} which proposes that highly reactive infants are more sensitive than their peers to both negative and positive environmental influences. In support of this model, multiple studies have shown the association between infant negative reactivity and later psychosocial outcomes such as problem behaviour and self-regulation to be moderated by parental behaviour, so that highly reactive children fare better than others when they experience optimal parenting but worse than others when they experience negative parenting.⁴¹⁻⁴⁶ Further support is found in studies indicating that interventions targeting parental attitudes and/or behaviours are particularly effective for children with a history of negative reactive temperament.^{47,49}

Conclusions and Implications

Aside from clear and diagnosable medical conditions, parents' primary complaint to clinicians during the infancy period is that of excessive fussing and crying, generally that which cannot be soothed or tolerated. There are, however, important distinctions to be made about crying in infancy: (a) Crying in early infancy increases over the first two months of life and then decreases

thereafter. Thus, excessive crying may be mis-attributed if the developmental course of crying is not understood; (b) Crying in excess of the normative rate during the first three months of life is categorized as colic. Colic is a transient condition that ends around the third to fourth month of an infant's life and appears to have few consequences for the child; (c) Crying and/or frequent fussing is a characteristic of negatively reactive temperament but can be distinguished from colic in several ways; colic is not a stable phenomenon and it manifests itself as intense crying bouts of long duration, whereas negative reactivity is stable and characterized by frequent bouts of fussiness. Finally, because of the persistence of negative reactivity for some infants more adverse outcomes are likely, particularly if the parental environment is non-supportive. It appears that this form of temperament may tax parents, leading to stressful interactions and negative perceptions. At the extreme, crying may lead to child maltreatment and/or shaken baby syndrome.^{50,51} Clinicians receiving complaints of excessive crying and fussing in infants should be aware of these distinctions and use appropriate measures to validate parental assessments.

References

1. Wolff PH. *The development of behavioral states and the expression of emotions in early infancy: New proposals for investigation*. Chicago, Ill: University of Chicago Press; 1987.
2. Barr RG. The normal crying curve: what do we really know? *Developmental Medicine and Child Neurology* 1990;32(4):356-362.
3. Barr RG, Hopkins B, Green JA. *Crying as a sign, symptom, and a signal: Clinical emotional and developmental aspects of infant and toddler crying*. New York, NY: Cambridge University Press; 2000.
4. Wessel MA, Cobb JC, Jackson EB, Harris GS, Detwiler AC. Paroxysmal fussing in infancy, sometimes called "colic". *Pediatrics* 1954;14(5):421-435.
5. Gormally S, Barr RG. Of clinical pies and clinical cues: Proposal for a clinical approach to complaints of early crying and colic. *Ambulatory Child Health* 1997;3(2):137-153.
6. Di Lorenzo C, St. James Roberts I. Summary and conclusions. *Journal of Pediatric Gastroenterology and Nutrition* 2013; 57:S42-S45.
7. Barr RG, Gunnar M. Colic: The "transient responsivity" hypothesis. In: Barr RG, Hopkins B, Green JA. *Crying as a sign, symptom, and a signal: Clinical emotional and developmental aspects of infant and toddler crying*. New York, NY: Cambridge University Press; 2000:41-66.
8. St. James Roberts I, Alvarez M, Hovish K. Emergence of a developmental explanation for prolonged crying in 1- to 4-month old infants: Review of the evidence. *Journal of Pediatric Gastroenterology and Nutrition* 2013;5: S30-S36.
9. Stifter C, Dollar J. Temperament and psychopathology. In D. Cicchetti (Ed.), *Developmental Psychology*, 3rd edition, Vol. III. (pp. 546-607) New York: Wiley. 2016.
10. Caspi A, Harrington H, Milne B, Amell JW, Theodore RF, Moffitt TE. Children's behavioural styles at age 3 are linked to their adult personality traits at age 26. *Journal of personality*. 2003 Aug. 1;71(4):495-514.
11. Putnam S, Rothbart M, Garnstein M. Homotypic and heterotypic continuity of fine-grained temperament during infancy, toddlerhood, and early childhood. *Infant and Child Development* 2008;17:387-405.

12. Putnam SP, Stifter CA. Behavioral approach-inhibition in toddlers: prediction from infancy, positive and negative affective components, and relations with behavior problems. *Child Development* 2005; 76(1):212-226.
13. Stifter CA, Putnam S, Jahromi L. Exuberant and inhibited toddlers: Stability of temperament and risk for problem behavior. *Development and Psychopathology* 2008 Mar 1;20(02):401-21.
14. Pesonen A-K, Raeikkoenen K, Keskiavaara P, Keltikangas-Jaervinen L. Difficult temperament in childhood and adulthood: Continuity from maternal perceptions to self-ratings over 17 years. *Personality and Individual Differences* 2003;34(1):19-31.
15. St. James-Roberts I, Conroy S, Wilsher C. Stability and outcome of persistent infant crying. *Infant Behavior and Development* 1998;21(3):411-435.
16. Stifter CA, Braungart J. Infant colic: A transient condition with no apparent effects. *Journal of Applied Developmental Psychology* 1992;13(4):447-462.
17. Stifter CA, Spinrad TL. The effect of excessive crying on the development of emotion regulation. *Infancy* 2002;3(2):133-152.
18. Barr R, Paterson J, Macmartin L, Lehtonen L, Young S. Prolonged and unsoothable crying bouts in infants with and without colic. *Developmental and Behavioural Pediatrics* 2005;26,14-23.
19. Lehtonen L, Korhonen T, Korvenranta H. Temperament and sleeping patterns in colicky infants during the first year of life. *Journal of Developmental & Behavioral Pediatrics* 1994;15(6):416-420.
20. Rautava P, Lehtonen L, Helenius H, Sillanpaa M. Infantile colic: child and family three years later. *Pediatrics* 1995;96(1 pt 1):43-47.
21. Canivert C, Jakobsson I, Hagander B. Infantile colic: Follow-up at four years of age; still more "emotional." *Acta Paediatrica* 2000;89,13-17.
22. Rao M, Brenner R, Schisterman E, Vik T, Mills J. Long term cognitive outcome in children with prolonged crying. *Archives of Disease in Childhood* 2004; 89:989-992.
23. Sloman J, Bellinger DC, Krentzel CP. Infantile colic and transient developmental lag in the first year of life. *Child Psychiatry and Human Development* 1990;21(1):25-36.
24. Humphry RA, Hock E. Infants with colic: A study of maternal stress and anxiety. *Infant Mental Health Journal* 1989;10(4):263-272.
25. Pinyerd BJ. Infant colic and maternal mental health: Nursing research and practice concerns. *Issues in Comprehensive Pediatric Nursing* 1992;15(3):155-167.
26. Stifter CA, Bono MA. The effect of infant colic on maternal self-perceptions and mother-infant attachment. *Child: Care, Health and Development* 1998;24(5):339-351.
27. Stifter CA. "Life" after unexplained crying: Child and parent outcomes. In: Barr RG, St James-Roberts I, Keefe MR, eds. *New evidence on unexplained early infant crying: its origins, nature and management*. Skillman, NJ: Johnson & Johnson Pediatric Institute; 2001:273-288.
28. Akman I, Kuscu K, Ozdemir N, Yurdakul Z, Solakogul M, Orhan L, Karabekiroglu A. Mothers' postpartum psychological adjustment and infantile colic. *Archives of Disease in Childhood* 2006; 91:417-419.
29. Radesky JS, Zuckerman B, Silverstein M, Rivara FP, Barr M, Taylor JA, Lengua LJ, Barr RG. Inconsolable infant crying and maternal postpartum depressive symptoms. *Pediatrics* 2013,131(6):e1857-64.
30. Clifford TJ, Campbell MK, Specchley KN, Gorodzinsky F. Sequelae of infant colic: evidence of transient infant distress and absence of lasting effects on maternal mental health. *Archives of Pediatrics & Adolescent Medicine* 2002 Dec 1;156(12):1183-8.
31. Vik T, Grote V, Escribano J, Socha J, Verduci E, Fritsch M, Carlier C, von Kries R, Koletzko B. Infantile colic, prolonged crying and maternal postnatal depression *Acta Paediatrica* 2009; 98:1344-1348.

32. Räihä H, Lehtonen L, Huhtala V, Saleva K, Korvenranta H. Excessively crying infant in the family: Mother-infant and father-infant and mother-father interaction. *Child: care, health and development* 2002 Sep 1;28(5):419-29.
33. Garstein MA, Putnam SP, Rothbart MK. Etiology of preschool behavior problems: Contributions of temperament attributes in early childhood. *Infant Mental Health Journal* 2012 Mar 1;33(2):197-211.
34. Miner JL, Clarke-Stewart KA. Trajectories of externalizing behavior from age 2 to age 9: relations with gender, temperament, ethnicity, parenting, and rater. *Developmental psychology* 2008 May;44(3):771.
35. Olson SL, Bates JE, Sandy JM, Lanthier R. Early developmental precursors of externalizing behavior in middle childhood and adolescence. *Journal of abnormal child psychology* 2000 Apr1;28(2):119-33.
36. Paulussen-Hoogeboom MC, Stams GJ, Hermanns J, Peetma TT. Child negative emotionality and parenting from infancy to preschool: A meta-analytic review. *Developmental Psychology* 2007 Mar;43(2):438.
37. Scaramella LV, Sohr-Pr DJ, Gartsteineston SL, irabile SP, Robison SD, Callahan KL. Parenting and children's distress reactivity during toddlerhood: An examination of direction of effects. *Social Development* 2008 Aug 1;17(3):578-95.
38. Bridgett DG, Gartstein MA, Putnam SP, McKay T, Iddins E, Robertson C, Ramsay K, Rittmueller A. Maternal and contextual influences and the effect of temperament developemnt during infancy on parenting in toddlerhood. *Infant Behavior and Development* 2009 Jan 31;32(1):103-16.
39. Belsky J, Pluess M. Beyond diathesis stress: Differential susceptibility to environmental influences. *Psychological Bulletin* 2009; 135(6):885-908.
40. Ellis BJ, Boyce WT, Belsky J, Bakermans-Kranenburg MJ, van Ijzendoorn HM. Differential susceptibility to the environment: An evolutionary-neurodevelopmental theory. *Development and Psychopathology* 2011; 23(1): 7-28.
41. Beaver KM, Hartman S, Belsky J. Differential susceptibility to parental sensitivity based on early-life temperament in the prediction of adolescent affective psychopathic personality traits. *Criminal justice and behaviour* 2014 Oct 17:0093854814553620.
42. Bradley RH, Corwyn RF. Infant temperament, parenting, and externalizing behavior in first grade: A test of the differential susceptibility hypothesis. *Journal of child psychology and psychiatry, and allied disciplines* 2008; 49(2):124.
43. Conradt E, Measelle J, Ablow JC. Poverty, problem behavior, and promise differential susceptibility among infants reared in poverty. *Psychological science* 2013 Jan 29:0956797612457381.
44. Kim S, Kochanska G. Child temperament moderates effects of parent-child mutuality on self-regulation: A relationship-based path for emotionally negative infants. *Child development* 2012 Jul 1;83(4):1275-89.
45. Van Zeijl J, Mesman J, Stolk MN, Alink LR, Van Ijzendoorn MH, Bakermans-Kranenburg MJ, Juffer F, Koot HM. Differential susceptibility to discipline: The moderating effect of child temperament on the association between maternal discipline and early childhood externalizing problems. *Journal of Family Psychology* 2007 Dec;21(4)626.
46. Xing S, Zhou Q, Archer M, Yue J, Wang Z. Infant temperamental reactivity, maternal and grandparental sensitivity: Differential susceptibility for behavior problems in China. *Early Human Development* 2016;99-105.
47. Anzman-Frasca S, Stifter CA, Paul IM, Birch LL. Negative temperament as a moderator of intervention effects in infancy: testing a differential susceptibility model. *Prevention Science* 2014 Oct 1;15(5):643-53.
48. Bakermans-Kranenburg MJ, Van Ijzendoorn HM. The hidden efficacy of interventions: Genex environment experiments from a differential susceptibility perspective. *Annual Review of Psychology* 2015;66:381-409.
49. Cassidy J, Woodhouse SS, Sherman LJ, Stupica B, Lejuez CW. Enhancing infant attachment security: An examination of treatment efficacy and differential susceptibility. *Development and Psychopathology* 2011 Feb 1;23(01)131-48.
50. Lee C, Barr RG, Catherine N, Wicks A. Age-related incidence of publicly reported shaken baby syndrome cases: is crying a trigger for shaking? *Journal of Developmental & Behavioral Pediatrics* 2007 Aug 1;28(4):288-93.

51. Reijneveld SA, Van der Wal MF, Brugman E, Sing RA, Verloove-Vanhorick SP. Infant crying and abuse. *The Lancet* 2004 Oct 15;364(9442):1340-2.