



The Infant Crying Questionnaire: Initial factor structure and validation

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ARTICLE INFO

Article history:

Received 6 March 2012

Accepted 8 June 2012

Key words:

Infant crying

Maternal sensitivity

Exploratory factor analysis

Reliability

Validity

ABSTRACT

The current project reports on an initial investigation into the factor structure of the Infant Crying Questionnaire (ICQ), a measure designed to assess parental beliefs about infant crying, in a sample of 259 primiparous mothers. Exploratory factor analyses yielded evidence for a five-factor structure to the ICQ, with two factors that may be conceptually viewed as *infant-oriented* beliefs regarding infant crying (Attachment/Comfort and Crying as Communication) and three factors conceptually reflecting *parent-oriented* beliefs regarding infant crying (Minimization, Directive Control, and Spoiling). Each of the scales demonstrated strong internal consistency and was associated with concurrent measures of mothers' causal attributions about emotional responses to infant crying. Predictive validity to observed maternal sensitivity at 6 months and mother-reported infant behavioral problems at one year was demonstrated. The importance of a questionnaire method to assess parents' beliefs regarding infant crying in developmental research is discussed and future methodological directions are outlined.

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1. Introduction

Infant crying is a salient social cue that elicits parental emotions and parenting behavior (Ainsworth, Bell, & Stayton, 1974; Leerkes, Gudmundson, & Burney, 2010; Leerkes, Parade, & Burney, 2010) and represents an attachment-related challenge to parents (Bowlby, 1969). Sensitive responses to infant distress or needs for safety and protection are thought to be of great developmental significance in relation to children's social and emotional functioning (Ainsworth, Blehar, Waters, & Wall, 1978; Bowlby, 1969; Goldberg, Grusec, & Jenkins, 1999; Thompson, 1997). Parents' beliefs about infant crying are important predictors of their behavioral responses, such that parents who endorse beliefs that are focused on the infant's well-being respond more quickly and sensitively to infant crying (Crockenberg & McCluskey, 1986; Leerkes, 2010). In turn, maternal sensitivity to infant distress is associated with positive developmental outcomes, such as attachment security, emotion regulation skills, and social and behavioral competence (Carmen, Pedersen, Huffman, & Bryan, 1993; Leerkes, 2010; Leerkes, Blankson, & O'Brien, 2009; McElwain & Booth-LaForce, 2006).

Despite the long held view that parental responses to infant crying are important in the context of child development, no questionnaire measure has been empirically developed to assess parental beliefs about infant crying. Such a measure would likely help predict individual variation in parenting behavior and related child outcomes during infancy and may augment current observational measures of parental sensitivity (Leerkes, Parade, & Gudmundson, 2011; Leerkes, Weaver, & O'Brien, 2012). Although observational measures of maternal behavior in response to infant distress are currently the gold standard, they are constrained in that eliciting infant distress from all infants in a sample is often difficult, and the duration of infant

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distress is often very brief providing limited opportunities for direct observation of parental response. Moreover, parents may engage in similar behaviors for varying reasons; some mothers may engage in comforting behaviors because they want their infants to feel better while others do so because they find crying aversive and simply want it to stop. The goal or belief underlying the response may be an important indicator of the extent to which the parent prioritizes infant needs, a key marker of sensitivity (Ainsworth et al., 1974). Thus, supplementing observational measures of parental responses to infant distress with a questionnaire of parents' beliefs regarding infant crying may enhance the predictive validity of sensitivity in relation to children's social and emotional adjustment (e.g., Leerkes et al., 2011).

Recently, Leerkes, Gudmundson, et al. (2010) and Leerkes, Parade, et al. (2010) developed the Infant Crying Questionnaire (ICQ) to assess global beliefs about infant crying (i.e., no context is provided regarding the occurrence of infant crying). Item content of the ICQ was generated based on earlier work in which 168 primiparous mothers, across two studies, were interviewed about their beliefs and goals in relation to infant crying (Leerkes, 2010; Leerkes, Crockenberg, & Burrous, 2004). Mothers tended to describe *infant-oriented* beliefs that place a priority on infants' and toddler's needs, desires, and well-being (e.g., I want my child to be safe), and *parent-oriented* beliefs that place a priority on parents' needs and well-being (e.g., I want my child to stop crying because it bothers me; for more discussion of these orientations, see Dix, 1991, 1992; Dix, Gershoff, Meunier, & Miller, 2004; Leerkes, Gudmundson, et al., 2010; Leerkes, Parade, et al., 2010).

Drawing from this qualitative work, the original ICQ was developed, consisting of 43 items (Leerkes, Gudmundson, et al., 2010; Leerkes, Parade, et al., 2010). Items were designed to encompass six conceptually derived scales, three of which were infant-oriented, (Attachment, Crying as Communication, and Positive Adjustment) and three of which were parent-oriented (Minimization, Spoiling, and Parent Esteem). Prior work (Leerkes, Gudmundson, et al., 2010; Leerkes, Parade, et al., 2010) has shown these scales to possess adequate internal reliability and predictive validity. ICQ scales that tap infant-oriented beliefs regarding infant crying have been positively associated with concurrent measures of observed maternal sensitivity and infants' use of adaptive regulatory behaviors and subsequent infant–mother attachment security, whereas ICQ scales that tap parent-oriented beliefs about crying are negatively associated with observed sensitivity (Leerkes, Gudmundson, et al., 2010; Leerkes, Parade, et al., 2010). In the present analyses, we formally examine the factor structure of the ICQ using exploratory factor analysis (EFA) and present initial reliability and validity information for the derived and retained factor scales in a larger and more diverse sample of mothers.

We assess the convergent validity of the ICQ scales by examining associations between empirically derived ICQ scales and expectant mothers' causal attributions about and emotional reactions in response to infant crying, elicited by showing mothers digitized video clips of crying infants. Based on prior research linking parents' broader parental beliefs with the nature of their causal attributions about child behavior (Hastings & Grusec, 1998), we expected that parent-oriented ICQ scales would be positively associated with mothers' negative (e.g., the baby is spoiled) and minimizing (i.e., non-emotional) attributions regarding infant crying and that infant-oriented scales of the ICQ would demonstrate the opposite pattern. Likewise, drawing from prior research demonstrating that mothers' negative and self-oriented beliefs about crying are linked with more negative and less empathic self-reported emotional reactions to crying (Leerkes, 2010; Leerkes et al., 2004), we expected that infant-oriented scales of the ICQ would be positively associated with maternal self-reports of empathy and negatively associated with maternal self-reports of anger and anxiety in response to infant crying, whereas the opposite pattern would be apparent for parent-oriented ICQ scales.

Secondly, we examine the predictive validity of empirically derived ICQ scales by assessing the relation between prenatal ICQ scales and observed maternal sensitivity with their own 6-month-old infants, and with maternal reports of infant problem behavior and social–emotional functioning at 1 year. Consistent with prior research linking parenting beliefs and behavior (Crockenberg & McCluskey, 1986; Leerkes, 2010; Leerkes et al., 2004; Zeifman, 2003), we expected infant-oriented scales of the ICQ to show positive associations and parent-oriented scales of the ICQ negative associations with observed maternal sensitivity. Relatedly, given established relations between sensitivity to distress and infant and child adaptation (Davidov & Grusec, 2006; Leerkes et al., 2009; McElwain & Booth-LaForce, 2006) we expected infant-oriented scales of the ICQ to predict positive child outcomes and parent-oriented scales to predict negative child outcomes.

2. Methods

2.1. Participants

Participants in the current study were drawn from a prospective longitudinal study in the southeastern United States investigating the origins of maternal sensitivity during infancy. The sample consisted of 259 primiparous mothers (128 European American, 131 African American) and their infants. At recruitment, participants ranged in age from 18 to 44 years ($M = 25$ years). Twenty-seven percent had a high school degree or less, 27% had some college, and 46% had a 4-year college degree or beyond. The majority were married or living with their child's father (57%), 24% were in a relationship with their child's father, and 19% were single. Annual family income ranged from less than \$2000 to over \$100,000; median income was \$35,000. The analytic sample for the various analyses below varied due to missing data. Two participants did not complete the ICQ, thus the factor analytic sample was $N = 257$. At 6 months, observed sensitivity ratings were available for 38.9% ($N = 100$) of the participants, and at 1 year, 62.6% ($N = 161$) of the participants had complete data from the measure of infant social–emotional functioning. ICQ scale scores for the subsamples for whom 6-month sensitivity and 1-year outcome data were available did not differ from those who had missing data.

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