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# Maternal postnatal psychiatric symptoms and infant temperament affect early mother-infant bonding



Saara Nolvi<sup>a,\*</sup>, Linnea Karlsson<sup>a,c</sup>, David J. Bridgett<sup>b</sup>, Marjukka Pajulo<sup>a,d</sup>, Mimmi Tolvanen<sup>a</sup>, Hasse Karlsson<sup>a,e</sup>

- <sup>a</sup> The FinnBrain Birth Cohort Study, Turku Brain and Mind Center, Department of Clinical Medicine, University of Turku, Finland
- <sup>b</sup> Department of Psychology, Northern Illinois University, United States
- <sup>c</sup> Department of Child Psychiatry, Turku University Hospital, Finland
- d Academy of Finland, Finland
- <sup>e</sup> Department of Psychiatry, University of Turku, Finland

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#### ABSTRACT

Postnatal mother-infant bonding refers to the early emotional bond between mothers and infants. Although some factors, such as maternal mental health, especially postnatal depression, have been considered in relation to mother-infant bonding, few studies have investigated the role of infant temperament traits in early bonding. In this study, the effects of maternal postnatal depressive and anxiety symptoms and infant temperament traits on mother-infant bonding were examined using both mother and father reports of infant temperament. Data for this study came from the first phase of the FinnBrain Birth Cohort Study (n = 102, father reports n = 62). After controlling for maternal symptoms of depression and anxiety, mother-reported infant positive emotionality, measured by infant smiling was related to better mother-infant bonding. In contrast, infant negative emotionality, measured by infant distress to limitations was related to lower quality of bonding. In regards to father-report infant temperament, only infant distress to limitations (i.e., frustration/anger) was associated with lower quality of mother-infant bonding. These findings underline the importance of infant temperament as one factor contributing to early parentinfant relationships, and counseling parents in understanding and caring for infants with different temperament traits.

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Postnatal bonding refers to a mother's early emotional connectedness to her infant. Bonding starts developing during the prenatal period and continues to develop throughout the postnatal period (Salisbury, Law, LaGasse, & Lester, 2003). Underscoring the importance of early mother-infant bonding, bonding is related to children's subsequent secure attachment (Bicking Kinsey & Hupcey, 2013) and to higher quality mother-child interactions, such as increased maternal responsiveness to infant cues (Hornstein et al., 2006). In turn, better child attachment and maternal parenting behaviors are important for development in a number of domains, including social competence, cognitive development and physical health (Campbell, Matestic, von Stauffenberg, Mohan, & Kirchner, 2007; Milgrom, Westley, & Gemmill, 2004; Murray, Fiori-Cowley, Hooper, & Cooper, 1996; Ranson & Urichuk, 2008). Given the importance of early bonding, understanding what factors may influence early bonding has implications for basic science and applied interventions.

<sup>\*</sup> Corresponding author. E-mail address: saara.nolvi@utu.fi (S. Nolvi).

Existing work has demonstrated that the mother-infant relationship, including bonding, develops as a function of a number of factors. However, most existing research has focused on the effects of maternal characteristics on bonding. For instance, maternal depression has frequently been associated with poorer bonding (Hornstein et al., 2006; Müller, Teismann, Havemann, Michalak, & Seehagen, 2013). Less work has specifically considered the role of infant characteristics, such as temperament, in relation to maternal bonding, despite the recognized role of children's temperament in relation to other aspects of the parent-child relationship (e.g. Dix & Yan, 2014). In light of the limited work that has considered infant temperament in relation to mother-infant bonding, the current investigation sought to examine relations between infant temperament and bonding while accounting for the influence of maternal anxiety and depressive symptoms.

#### 1. Associations between infant temperament and mother-infant bonding

Temperament refers to biologically-based individual differences in the domains of activity, affectivity, attention and self-regulation (Rothbart & Bates, 2006; Shiner et al., 2012). There is long-standing interest in relations between children's temperament and their developmental outcomes (e.g., relations between child negative emotionality and later psychiatric symptoms; Kotelnikova, Mackrell, Jordan, & Hayden, 2014; Pluess & Belsky, 2010). Alongside interest in relations between temperament and children's outcomes, there also is considerable interest in how children's temperament characteristics may affect the contexts in which they are raised, including the parenting that they receive. For example, elevated infant negative emotionality appears to contribute to parent-child interaction difficulties (Stright, Gallagher, & Kelley, 2008; van den Bloom & Hoeksma, 1994), the quality of attachment (Calkins & Fox, 1992), parenting behavior (Belsky, 1984), and parenting stress (Oddi, Murdock, Vadnais, Bridgett, & Gartstein, 2013), which are phenomena closely related to bonding. Similarly, in older children, irritability (Lengua & Kovacs, 2005) or earlier negative emotionality (Bridgett et al., 2009; Laukkanen, Ojansuu, Tolvanen, Alatupa, & Aunola, 2014; Lengua & Kovacs, 2005; Sanson, Hemphill, & Smart, 2004) have frequently been related to non-optimal parenting.

Although negative affect has been the most frequently considered temperament attribute in relation to parenting-related outcomes, there is some evidence that other temperament attributes may affect such outcomes. Kochanska, Friesenborg, Lange and Martel (2004) reported that laboratory assessed infant joy contributed to positive parent-child interactions. Other investigators have reported similar findings, with child positive emotionality and self-regulation being related to more positive parenting (Sanson et al., 2004) or eliciting less negative parenting behavior (Bridgett, Laake, Gartstein, & Dorn, 2013).

Given some overlap between parent bonding and other parenting behaviors, such as those observed during parentinfant interactions (Hornstein et al., 2006; Noorlander, Bergink, & van den Berg, 2008) it might be anticipated that infant temperament would influence maternal bonding during the postpartum period. However, only two studies have specifically considered relations between infant temperament and early mother-infant bonding. Parfitt et al. (2014) found that infant difficult temperament was associated with lower quality of mother-infant bonding at 3 months postpartum for both mothers and fathers after adjusting for the quality of the couple's relationship and parental mental health, as well as bonding at 15 months after controlling for earlier parent-infant bonding. In the only other study to specifically consider bonding, Edhborg et al. (2005) found that infant fussiness and negative affect were related to lower quality of bonding between mothers and their infants. Furthermore, lower quality of father-infant bonding was associated with infant unpredictability and dullness. In addition to the two studies that have considered infant temperament, several studies have considered infant attributes that are sometimes considered to be markers of difficult temperament. For example, lower quality of bonding has been associated with infant colic (Bicking Kinsey, Baptiste-Roberts, Zhu, & Kjerulff, 2014), which might share some common variance with infant negative affect (Canivet, Jakobsson, & Hagander, 2000; Lester, Zachariah Boukydis, Garcia-Coll, Hole, & Peucker, 1992; St. James-Roberts, Conroy, & Wilsher, 1998), and with infant sleep difficulties (Hairston et al., 2011), which has also been linked with infant irritability. Thus, these studies bolster the evidence of the potential role of infant temperament in the formation of mother-infant bonding.

As the material briefly covered in this section illustrates, existing work that considers infant temperament in relation to parenting-related outcomes has primarily focused on infant negative affect and irritability. Few studies have investigated associations between positive emotionality and the parent-infant relationship (see Bridgett et al., 2013 and Sanson et al., 2004 for notable exceptions). Similarly, most of the current research has focused on relations between broad temperament constructs (e.g., negative emotionality) and bonding instead of considering relations between finer-grained aspects of temperament (e.g., fearfulness) and bonding. Moreover, the few studies that have considered relations between infant temperament and bonding have not used measures capable of differentiating relations between distinct temperament traits (e.g., positive and negative emotionality). These limitations are addressed in the current study.

#### 2. Maternal mental health and mother-infant bonding

In contrast to the scarcity of research considering relations between infant temperament and early maternal bonding, more numerous studies have reported associations between aspects of maternal mental health and the quality of early bonding. For example, postnatal depression (Bicking Kinsey & Hupcey, 2013; Hornstein et al., 2006; Müller et al., 2013) and depressive symptoms (Bicking Kinsey et al., 2014; Dubber, Reck, Müller, & Gawlik, 2014; Edhborg, Nasreen, & Nahar Kabir, 2011; Hairston et al., 2011; Moehler, Brunner, Wiebel, Reck, & Resch, 2006; Müller et al., 2013; Ohoka et al., 2014; Reck

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