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## Infant Behavior and Development



## Don't worry, be (moderately) happy: Mothers' anxiety and positivity during pregnancy independently predict lower mother–infant synchrony



### Ginger A. Moore<sup>a</sup>, Kelsey M. Quigley<sup>a</sup>, Kristin M. Voegtline<sup>b</sup>, Janet A. DiPietro<sup>b</sup>

<sup>a</sup> The Pennsylvania State University, University Park, PA, USA

<sup>b</sup> Johns Hopkins Bloomberg School of Public Health, Baltimore, MD, USA

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#### ABSTRACT

Maternal positivity and mother–infant synchrony have been linked, independently, to beneficial infant outcomes; however, research that has examined relations between the two has found that higher positivity is associated with lower synchrony. Methodological issues may inform this counter-intuitive association and clinical theory supports its validity. This study examined the theory that heightened positivity associated with anxiety is a way of avoiding negative emotion and contributes to lower synchrony because it interferes with appropriate responding to infant cues. We examined mothers' (*N*=75) self-reported anxiety and verbal expression of positivity during pregnancy in relation to mother–infant synchrony at 6 months post-partum. Verbal positivity was assessed using linguistic analysis of interviews about pregnancy experiences. Mother and infant affect and gaze were coded during interaction and synchrony was computed as the correlation between mother and infant behaviors. Higher verbal positivity and anxiety during pregnancy independently predicted lower mother–infant synchrony, suggesting distinct pathways to the same degree of synchrony with potentially different consequences for infant development.

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#### 1. Introduction

During infancy, parenting is typically represented by images of happy babies and happy mothers, which may place pressure on mothers to be overly positive when interacting with their infants. Developmental research may have added to this pressure by promoting the role of shared mother-infant positivity (e.g., Mäntymaa et al., 2015), which tends to discourage anything but positive emotion expression by mothers. Although maternal positivity is consistently associated with healthy socioemotional (e.g., Eisenberg et al., 2005) and cognitive (e.g., Ryan, Martin, & Brooks-Gunn, 2006) outcomes in children, this may be, in part, because research has tended to use measures of positivity that encompass aspects of warm, sensitive parenting beyond positive affect (Harrist & Waugh, 2002) or has focused on problematic forms of diminished positivity, as in parental depression. Of note, a high degree of maternal positive affect towards infants is not culturally universal (Keller, Völker, & Yovsi, 2005; Tronick & Beeghly, 2011). Therefore, the large body of work promoting the benefits of high levels of positivity in parenting should be interpreted thoughtfully in light of limitations of existing research, cultural variation,

Abbreviations: FFSF, Face-to-Face Still-Face. E-mail address: gam16@psu.edu (G.A. Moore).

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and research that supports exposing infants to a broad and balanced array of emotions (e.g., Malatesta, Culver, Tesman, & Shepard, 1989).

Excessive maternal positivity may actually impede accurate, attuned responses to infant cues. Theories of parent–infant co-regulation propose that dynamic adaptation of each partner to the other is fundamental to infants' developing emotion regulation (e.g., Tronick, 2007). This suggests that mothers need to provide variety in their emotion expressions, not maintain one-note positivity. The call and response between infant and parent is often characterized as synchrony, which measures temporal dyadic coordination and has been related to numerous beneficial outcomes (Feldman, 2007), but has also been subject to inconsistencies in measurement and definition, including confounding measures of synchrony with parenting positivity (Harrist & Waugh, 2002).

Although past research has linked high levels of maternal positivity and high levels of synchrony, *independently*, to beneficial outcomes, the few studies that have examined relations between the two constructs have found that higher levels of maternal positive affect have been found to be associated with lower mother–infant synchrony (Feldman, Granat, & Gilboa-Schechtoman, 2005; Moore et al., 2013). Given the emphasis on shared positive affect as the goal of mother–infant interaction, an association between lower synchrony and greater maternal positive affect may initially seem counter-intuitive. However, when considering the definition of synchrony as the temporal coordination of partners' states, independent of affective valence (e.g., Feldman, 2007) and positivity in terms of specific measures (e.g., verbal positivity, facial positive affect) rather than global measures of warm, sensitive parenting, the findings make more sense. A mother who maintains high levels of positive affect when interacting with her infant may not be responsive to the ebb and flow of infants' cues and, thus, may not provide the structured variability of mismatch and repair that helps to shape infants' learning of social contingency (Tronick, 2007).

High levels of positivity, therefore, may be problematic if they are non-contingent and contribute to an inflexible and invariant affective experience for infants. For example, mothers with high levels of anxiety have been found to maintain positive affect irrespective of infant cues (Feldman, 2007; Feldman et al., 2005). Because anxiety is associated with avoidance of negative emotions (Aldao, Nolen-Hoeksema, & Schweizer, 2010), some evidence indicates that high levels of expressed positive affect by mothers may reflect this form of avoidance coping (e.g., Borelli, West, Decoste, & Suchman, 2012). In support of this, an evaluation of 11 mothers with anxiety disorders from a community sample (Feldman et al., 2005) revealed that anxious mothers scored higher than others on displays of positive affect and motherese, and that anxious mothers' behaviors were often not matched to infants' states and signals. Maternal anxiety has also been related to intrusiveness with infants (Biringen, 1990; Cox, Owen, Lewis, & Henderson, 1989), with that intrusiveness characterized by more rapid and intense responses than other mothers (Feldman, Greenbaum, Mayes, & Erlich, 1997). Therefore, although prior work has focused on lower synchrony in relation to maternal depression, which assumes diminished positive affect (e.g., Field, Healy, Goldstein, & Guthertz, 1990) and, thus, implies that greater positive affect is preferable, research is accumulating to suggest that a surfeit of positivity, particularly if it is associated with anxiety, may also diminish mother–infant synchrony.

In light of research emphasizing the importance of parent–infant synchrony for healthy development, new work identifying maternal factors that contribute to synchrony is warranted. Greater synchrony has been found to predict better self-regulation and compliance, fewer behavior problems, and healthy social–emotional adjustment later in childhood (Feldman, 2007; Feldman & Eidelman, 2004; Feldman, Greenbaum, & Yirmiya, 1999). As early as three months of age, lower levels of mother–infant synchrony have been associated with higher physiological arousal and atypical vagal reactivity in infants during face-to-face interaction with their mothers (Moore & Calkins, 2004). This is likely because attuned, timely responding to infant cues is thought to foster a connection characterized by reciprocity and trust, ultimately promoting a sense of efficacy in restoring calm that grows the infant's capacity for self-regulation.

#### 2. The current study

The current study aimed to contribute to a more nuanced understanding of the role of mothers' positivity in infant development by examining relations among maternal positivity, anxiety, and mother–infant synchrony. To the extent that heightened maternal positivity is a function of anxiety and avoidance of negative emotion, high levels could indicate unresponsiveness to infants' cues. This would suggest that the relation between higher maternal positivity and lower synchrony is mediated by anxiety.

To assess maternal positivity, we measured mothers' verbal expression of positivity using linguistic analysis of the frequency of positive emotion words during the third trimester of pregnancy. By asking mothers to talk specifically about the positive and negative aspects of their pregnancies, we intended to tap into a tendency to accentuate the positive even when talking about difficult experiences related to childbearing. Conducting interviews prior to infants' births afforded an assessment of maternal positivity independent of child characteristics and allowed us to determine whether maternal contributors to lower mother–infant synchrony could be ascertained prior to childbirth.

Although rarely studied as an index of maternal affect, the frequency of emotion-related words that individuals use when describing their experiences has robust associations with personality, behavior, relationship quality, and mental health (Pennebaker, Mehl, & Niederhoffer, 2003; Seider, Hirschberger, Nelson, & Levenson, 2009) and is stable and reliable across time and topic (Pennebaker & King, 1999; Pennebaker & Stone, 2003). One study that did use linguistic analysis of interviews with mothers (Borelli et al., 2012) conceptualized high rates of positive emotion words as avoidance of negative affect and found that substance-abusing mothers who used positive emotion words more frequently than other mothers

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