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Full length article

## Maternal avoidance, anxiety cognitions and interactive behaviour predicts infant development at 12 months in the context of anxiety disorders in the postpartum period



C. Reck<sup>a,\*,1</sup>, B. Van Den Bergh<sup>d,1</sup>, A. Tietz<sup>b</sup>, M. Müller<sup>a</sup>, A. Ropeter<sup>c</sup>, B. Zipser<sup>b</sup>, S. Pauen<sup>c</sup>

<sup>a</sup> Ludwig-Maximilians University, Department of Psychology, Munich, Germany

<sup>b</sup> Heidelberg University Hospital, General Psychiatry, Heidelberg, Germany

<sup>c</sup> University of Heidelberg, Department of Psychology, Heidelberg, Germany

<sup>d</sup> Tilburg University, Department of Developmental Psychology, Netherlands

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### ABSTRACT

**Background:** Few studies have examined the relation between anxiety disorders in the postpartum period and cognitive as well as language development in infancy.

**Aims:** This longitudinal study investigated whether anxiety disorder in the postpartum period is linked to infant development at twelve months. A closer look was also taken at a possible link between maternal interaction and infant development.

**Study design:** Subjects were videotaped during a Face-to-Face-Still-Face interaction with their infant ( $M = 4.0$  months). Specific maternal anxiety symptoms were measured by self-report questionnaires (Anxiety Cognition Questionnaire (ACQ), Body Sensations Questionnaire (BSQ), Mobility Inventory (MI)) to check for a connection with infant development. The Bayley Scales of Infant and Toddler Development-III (Bayley-III) were used to assess infant language and cognitive development at one year of age.

**Subjects:**  $n = 34$  mothers with anxiety disorder (SCID-I; DSM-IV) and  $n = 47$  healthy mothers with their infant.

**Outcome measures:** Infant performance on Bayley-III language and cognitive scales.

**Results:** Infants of mothers with anxiety disorder yielded significantly lower language scores than infants of controls. No significant group differences were found regarding infant cognitive development. Exploratory analyses revealed the vital role of “maternal avoidance accompanied” in infant language and cognitive development. Maternal neutral engagement, which lacks positive affect and vocalisations, turned out as the strongest negative predictor of cognitive development. Maternal anxiety cognitions and joint activity in mother-infant interaction were the strongest predictors of infant language performance.

**Conclusions:** Results underline the importance to also consider the interaction behaviour of women with anxiety disorders to prevent adverse infant development.

\* Corresponding author at: Ludwig-Maximilians University Munich, Department of Psychology, Clinical Psychology of Childhood and Adolescence, Leopold Str. 13, 80802 Munich, Germany.

E-mail address: [Corinna.Reck@psy.lmu.de](mailto:Corinna.Reck@psy.lmu.de) (C. Reck).

<sup>1</sup> Shared first authorship.

## 1. Introduction

In the first year of life, infants develop substantial motor, cognitive, language and socio-emotional skills. The increasing understanding of environmental influences on the neuroplasticity of the young brain stresses the significance of a stimulating environment for optimal child development (Kingston, Tough, & Whitfield, 2012). Exposing infants to a variety of beneficial and age-appropriate stimuli provides an excellent starting point for the developing child (Bornstein & Lamb, 2002; Csibra & Gergely, 2009; Pauen, 2006). Some factors of the immediate environment may be less beneficial for infant development though, e.g. maternal distress or mental health problems. The detrimental effect of maternal depression after child birth on emotional, behavioural, cognitive and language development in infant- and childhood is well-documented (Cornish et al., 2005; Galler, Harrison, Ramsey, Forde, & Butler, 2000; Grace, Evindar, & Stewart, 2003; Murray & Cooper, 1996, 1997; Sohr-Preston & Scaramella, 2006). The prevalence of anxiety disorders in the postpartum period, ranging from approximately 8% (Austin et al., 2010; Goodman, Watson, & Stubbs, 2016; Wenzel, Haugen, Jackson, & Brendle, 2005) to 12.7% (Reck et al., 2008), is comparable to the rates of postpartum depression (Beck & Gable, 2001; Reck et al., 2008; Yonkers et al., 2001); yet, the potential link between anxiety disorder in the postpartum period and infant development has hardly been subject of investigation. The limited research available focused particularly on possible socio-emotional disadvantages in the offspring of women with anxiety disorders (Feldman et al., 2009; Leis, Heron, Stuart, & Mendelson, 2014; Murray, Cooper, Creswell, Schofield, & Sack, 2007; Reck, Müller, Tietz, & Moehler, 2013). To the best of the authors' knowledge, fewer studies have been dedicated to infant cognitive and language development. The published research in this regard investigated mostly the cognitive and language skills of young children of women with prepartum anxiety disorders (for an overview, Schlotz & Philips, 2009; Stein et al., 2014). These findings are inconsistent, but a vast amount of studies suggested that maternal anxiety in pregnancy is associated with lower cognitive and language development scores in childhood (Brouwers, van Baar, & Pop, 2001; Buitelaar, Huizink, Mulder, de Medina, & Visser, 2003; Davis & Sandman, 2010; Huizink, Robles de Medina, Mulder, & Buitelaar, 2003; King & Laplante, 2005; Laplante et al., 2004; for a review, Van den Bergh, Mulder, Mennes, & Glover, 2005) and adolescence (Mennes, Stiers, Lagae & Van den Bergh, 2006; Mennes, Van den Bergh, Lagae & Stiers, 2009; Van den Bergh, Mennes et al., 2005; Van den Bergh et al., 2006). The findings regarding prepartum anxiety disorders are relevant for the presented study because most women with anxiety disorders in the postpartum period report a prepartum onset of anxiety disorders (Reck et al., 2008; Martini, Weidner, & Hoyer, 2008; Matthey, Barnett, Howie, & Kavanagh, 2003).

Although less is known about the potential effects of anxiety disorders in the postpartum period on infants' cognitive and language competencies, there is some empirical evidence that children of postpartum anxious women perform worse on cognitive tasks than those of healthy mothers (for an overview, Glasheen, Richardson, & Fabio, 2010). For example, maternal anxiety and feelings of despair six months postpartum predicted lower scores in a national high school examination at eleven to twelve years of age in the offspring of anxious women (Galler et al., 2004). However, according to Keim and colleagues, maternal trait anxiety and stress level had no significant negative influence on the cognitive development of infants at one year of age (Keim et al., 2011). Furthermore, maternal mental health problems comprising also maternal anxiety had negligible effect on infants' communication performance at eight or twelve months of age (Reilly et al., 2006).

Regarding the inconsistent findings on the effects of prepartum and postpartum anxiety disorders on infant cognitive and language development, more research is clearly needed; especially because cognitive and language competencies are crucial for more advanced skills like communication, learning and problem solving. If anxiety disorder in the postpartum period should be linked to less optimal infant development, the question arises through which pathway. Maternal anxiety disorder itself might have an influence on the emerging infant cognitive and language skills. A closer look at the different facets of an anxious symptomatology would clarify if only certain symptoms are detrimental or if an anxiety disorder per se bears a developmental risk for the infant.

Another aspect worth considering is the quality of maternal interaction behaviour as the mother usually represents the primary caregiver and largely guides the infant's experience with the social and non-social world (Csibra & Gergely, 2009; Murray, Kempton, Woolgar, & Hooper, 1993; Papoušek, 2007; Tamis-LeMonda, Bornstein, & Baumwell, 2001). The notion that the mother-infant interaction is as an important source of social learning is supported by numerous findings. First, disturbances in early mother-infant interaction were predictive of poorer infant cognitive outcome at 18 months (for an overview, Murray & Cooper, 1996). Second, research investigating the effects of prolonged mother-infant centred interventions suggested that cognitive and language disadvantages in young children of women with postpartum depression may be counterbalanced by mother-toddler therapy (Cicchetti, Rogosch & Toth, 2000).

It has been argued that maternal distress and psychological disorders could compromise mother-infant interaction, which, in turn, might affect infant mental and language skills (Feldman & Eidelman, 2009). For instance, postpartum depressed mother-infant dyads showed altered interactive contingency patterns than control dyads (Beebe et al., 2012). Self-consistency of both partners was lowered along with higher depressive symptoms whereas interactive contingency deviated from an optimal mid-range. In addition, mothers with postpartum depression were less responsive and contingent as well as more withdrawn and intrusive when interacting with their infant compared to controls (Field, Healy, Goldstein, & Guthertz, 1990; Murray & Cooper, 1996; Murray, Fiori-Cowley, Hooper, & Cooper, 1996; Reck et al., 2001). Such interaction styles were associated with various infant emotional and behavioural problems like emotional dysregulation and less efficient processing of contingent relationships (Beebe et al., 2008; Stanley, Murray, & Stein, 2004; Tronick, 1989). This, in turn, has been related to poorer cognitive and emotional functioning in childhood (e.g., Milgrom, Westley, & Gemmill, 2004; Morrell & Murray, 2003; Murray et al., 1993). With regard to maternal depression, it has been demonstrated that impaired infant developmental trajectories were mediated by dysfunctional mother-infant interactions (Edwards & Hans, 2015; Foster, Garber, & Durlak, 2008).

Studies dedicated to mother-infant interaction in case of postpartum anxiety disorder are sparse but some have linked maternal

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