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Review

Contextual stress and maternal sensitivity: A meta-analytic review of stress associations with the Maternal Behavior Q-Sort in observational studies

Anna T. Booth^{a,b}, Jacqui A. Macdonald^{a,b,c,*}, George J. Youssef^{a,b}

^a Deakin University, Centre for Social and Early Emotional Development, School of Psychology, Faculty of Health, 221 Burwood Highway, Burwood, VIC 3125, Australia

^b Murdoch Childrens Research Institute, Population Studies of Adolescents, The Royal Children's Hospital Melbourne, 50 Flemington Rd., Parkville, VIC 3052, Australia

^c The University of Melbourne, Department of Paediatrics (RCH Academic Centre), The Royal Children's Hospital Melbourne, Level 2, West Building, 50 Flemington Rd., Parkville, VIC 3052, Australia

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ABSTRACT

Maternal sensitivity is a modifiable determinant of infant attachment security and a precursor to optimal child development. Contextual stressors undermine sensitivity, but research was yet to be synthesized. We aimed to identify (i) types of stress associations analyzed in studies of maternal sensitivity and (ii) the strength of effects of various stress factors. A systematic search identified all studies that used the Maternal Behavior Q-Sort (MBQS) to code sensitivity in dyadic observations and that reported a coefficient for MBQS associations with contextual stress. Identified stressors cohered around three spheres: sociodemography (maternal education, family income, composite SES, maternal age and cohabitation status); parenting stress (perceived maternal stress related to parenting); and mental health (specifically maternal internalizing symptoms). Seven meta-analyses (combined *ns* range 223–1239) of a subset of 30 effects from 20 articles, and a multi-level meta-analysis ($N = 1324$) assessed aggregated correlations with sensitivity. Significant mean effects emerged in expected directions, whereby all stress indicators were negatively associated with sensitivity. Small effects were found for associations with parenting stress ($r = -0.13$) and mental health indicators ($r = -0.12$). Generally moderate effects were found for associations with socio-demographic indicators (range $r = -0.12$ to $r = 0.32$). Emerging findings support the proposition that in various contexts of stress, maternal sensitivity to infant needs can be undermined. Implications and research directions are discussed.

Background

Maternal sensitivity is a critical determinant of healthy infant development (Moran, Forbes, Evans, Tarabulsky, & Madigan, 2008). It predicts infant attachment security (Bailey, Redden, Pederson, & Moran, 2016; Bernier, Bélanger, Tarabulsky, Simard, & Carrier, 2014; De Wolff & van IJzendoorn, 1997; Moran, Pederson, Pettit, & Krupka, 1992; Pederson et al., 1990; Posada, Carbonell, Alzate, & Plata, 2004; Whipple, Bernier, & Mageau, 2011a), thereby laying foundations for socio-emotional competence across the life-course (Hazan & Shaver, 1994; Waters, Merrick, Treboux, Crowell, & Albersheim, 2000). Sensitivity is also relevant to a broad range of other offspring outcomes including executive function (Bernier, Carlson, Deschênes, & Matte-Gagné, 2012; Bernier, Carlson, & Whipple,

* Corresponding author at: Deakin University, 221 Burwood Highway, Burwood, VIC 3125, Australia.

E-mail addresses: boan@deakin.edu.au (A.T. Booth), jacqui.macdonald@deakin.edu.au (J.A. Macdonald), george.youssef@deakin.edu.au (G.J. Youssef).

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2010; Rochette & Bernier, 2014a); behavior problems (Bordeleau, Bernier, & Carrier, 2012b; Niccols & Feldman, 2006); sleep quality (Bordeleau, Bernier, & Carrier, 2012a); and, body mass index (Wendland et al., 2014, 2015). Maternal sensitivity is a behavioral indicator of a caregiver's capacity to evaluate the type of care required by their child (Solomon & George, 1996) and involves the ability to perceive accurately and respond appropriately to the child's attachment-based signals (Ainsworth, Blehar, Waters, & Wall, 1978). Infants who experience sensitive caregiving develop confidence in their caregiver's emotional availability and responsiveness (Belsky & Fearon, 2002). When sensitivity is deficient, offspring in both infancy and preschool periods are at heightened risk of socio-emotional adjustment problems (Behrens, Parker, & Haltigan, 2011; De Wolff & van IJzendoorn, 1997; Posada et al., 2016). The predictive role of maternal sensitivity in child development is well understood (De Wolff & van IJzendoorn, 1997), but less is known about what predicts sensitivity.

To date, theorized predictive pathways to maternal sensitivity have centred on the role of adult attachment representations assessed by the Adult Attachment Interview (Bailey, Moran, Pederson, & Bento, 2007; Lindhiem, Bernard, & Dozier, 2011; Verhage et al., 2016; Ward & Carlson, 1995). Yet, meta-analysis indicates that as little as 12% of the variance in maternal sensitivity is explained by the AAI (van IJzendoorn, 1995), suggesting that more is unknown than known about the natural history of maternal sensitivity. Other evidence links child characteristics (Atkinson et al., 1999; Mills-Koonce et al., 2007) and biological or hormonal variations (Gonzalez, Jenkins, Steiner, & Fleming, 2012; van IJzendoorn, Bakermans-Kranenburg, & Mesman, 2008) to variation in maternal sensitivity. However, while associations are statistically significant, effect sizes are generally small. Important emerging evidence points to the potential impact of the social ecology on maternal sensitivity (Belsky & Fearon, 2002; Deschênes, Bernier, Jarry-Boileau, & St-Laurent, 2014; Lemelin, Tarabulsky, & Provost, 2006; Logsdon et al., 2015; Pereira et al., 2012; Pianta, Sroufe, & Egeland, 1989; Posada et al., 1999; Rochette & Bernier, 2014b; Tarabulsky et al., 2005). In her seminal studies, Mary Ainsworth (1967) brought early attention to the relevance of socioeconomic conditions and stress when discussing the living conditions of mothers who were unable to provide high quality care. It has since been empirically recognized that prolonged or acute stress exposures in the family environment can indeed undermine sensitivity (Belsky & Fearon, 2002; Pianta et al., 1989). In the most recent revision of the *Handbook of Attachment*, Feeney and Woodhouse (2016) draw a link between parental sensitivity and the family stress model – a process model in which socioeconomic pressure undermines parenting quality (Conger & Donnellan, 2007). They direct attention to evidence of relationships between low socioeconomic status (SES) and parental sensitivity in studies by Mesman, van IJzendoorn, and Bakermans-Kranenburg (2012), Chaudhuri, Easterbrooks, and Davis (2009) and Yaman, Mesman, van IJzendoorn, Bakermans-Kranenburg, and Linting (2010) in which parental sensitivity tends to be lower in minority than majority groups as a consequence of low SES and stress related to ethnic minority status. However, no-one to date has systematically reviewed this literature, and Feeney and Woodhouse (2016) call for a deeper evidence-based understanding of ecological (or contextual) contributions to parental caregiving behavior.

To address this gap, the focus of the current review is the impact of contextual stress on maternal sensitivity. While we acknowledge the likelihood of transactional relationships between factors, for current purposes, we distinguish contextual contributions from representational, biological/hormonal and child contributions. We adopt a Bronfenbrennerian language, whereby individuals operate within and are influenced by their broader “socio-ecological systems” (Bronfenbrenner, 1986). Ecological risks associated with *parenting practices* are extensively documented (Conger et al., 1992, 1993; Kwon & Wickrama, 2014; Lee, Wickrama, & Simons, 2013; Newland, Crnic, Cox, & Mills-Koonce, 2013; White, Liu, Nair, & Tein, 2015). In contrast, less attention has been paid to the ecology of *caregiving sensitivity*. This distinction is important, given that parenting practices are understood within a social learning and behavioral modelling framework (Patock-Peckham, Cheong, Balhorn, & Nagoshi, 2001; Simons, Whitbeck, Conger, & Melby, 1990), whereas caregiving sensitivity reflects an underlying affectional bond and dispositional response to the evolutionary goal of protecting and caring for a child (Solomon & George, 1996). Maternal sensitivity is primarily conceptualized within attachment and caregiving behavioral systems theory in which it is an indicator of the balance between self-regulation and regulatory support of a developing infant (Feeney & Woodhouse, 2016; Solomon & George, 1996).

Importantly, maternal sensitivity is modifiable through intervention, with outcomes as profound as enhancement of child attachment security (Bakermans-Kranenburg, van IJzendoorn, & Juffer, 2003; Moss et al., 2011) and reductions in internalizing and externalizing problems (Moss et al., 2011). The potential for modification has prompted calls for investigations that identify barriers to sensitivity, and in particular consideration of stress or adversity within the familial ecology (Feeney & Woodhouse, 2016; Hyunjeong, Young-Joo, Hosihn, & Gyeong-Ae, 2008; Posada, 2013; Tarabulsky et al., 2005). Without prior aggregated assessment of effects, how relevant the social ecology is to parental sensitivity has not been well understood. Due to the expense of collecting the observational data used to code sensitivity, many studies in this area have drawn from small samples. While valuable, there are inherent weaknesses in smaller studies and findings must be interpreted with caution unless data are aggregated. Given the critical role of optimal sensitivity in a child's early life, these associations warrant meta-analytic investigation.

In the current review, we deconstruct representations of the stress ecology in extant literature. These include financial strain, reduced knowledge and opportunities that arise from low education and young parental age, and a diminished capacity to manage daily demands in a context of stress or mental health problems (Belsky, 1984; Berry & Jones, 1995; Conger & Donnellan, 2007). Our guiding proposition is that contextual stress is negatively linked to sensitive caregiving. When contextual stress-demands contemporaneously compete with caregiving goals, parental sensitivity is potentially challenged in a way that it is not for parents in more ‘optimal’ circumstances. Theoretical discussion of why contextual stress might be relevant to sensitive caregiving has been minimal (Feeney & Woodhouse, 2016; Solomon & George, 1996) and this review seeks to stimulate research interest in this area.

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