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Mothers' and fathers' sensitivity and children's cognitive development in low-income, rural families☆

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ABSTRACT

This study examines associations between maternal and paternal sensitive parenting and child cognitive development across the first 3 years of life using longitudinal data from 630 families with co-residing biological mothers and fathers. Sensitive parenting was measured by observational coding of parent–child interactions and child cognitive development was assessed with the Bayley Scales of Infant Development and the Wechsler Preschool and Primary Scales of Intelligence. There were multiple direct and indirect associations between parenting and cognitive development across mothers and fathers, suggesting primary effects, carry-forward effects, spillover effects across parents, and transactional effects across parents and children. Associations between parenting and cognitive development were statistically consistent across mothers and fathers, and the cumulative effects of early parenting on later cognitive development were comparable to the effects of later parenting on later cognitive development. As interpreted through a family systems framework, findings suggest additive and interdependent effects across parents and children.

Sensitive and supportive parenting is one of the most consistent and robust predictors of multiple developmental outcomes, including children's cognitive development (Tamis-LeMonda, Shannon, Cabrera, & Lamb, 2004). From a family systems perspective (Cox & Paley, 2003; Minuchin, 1985), the effects of both maternal and paternal parenting are likely to be independent and dependent on one another, as well as transactional with the developing child over time, allowing for multiple direct and indirect mechanisms through which sensitive parenting may influence early development. Using longitudinal measures of observed maternal and paternal sensitive parenting and child cognitive functioning during the first 3 years of life, the current study is among the first to rigorously examine the multiple combinations of direct and indirect associations among mothers' and fathers' sensitive parenting and children's early cognitive development.

Sensitive parenting and children's early cognitive development

Correlational and experimental studies on animals and humans identify multiple contextual characteristics associated with early cognitive development (see Meaney & Szyf, 2005; Ramey & Ramey, 1998), one of which is the quality of parent–child interactions (Englund, Luckner, Whaley, & Egeland, 2004; Pianta & Egeland, 1994; Tamis-LeMonda et al., 2004). Dimensions of parenting behaviors that have been associated with child cognitive development include quality of instruction (Englund et al., 2004), linguistic and cognitive stimulation (Chang, Park, Singh, & Sung, 2009), physical care (Bronte-Tinkew, Carrano, Horowitz, & Kinukawa, 2008), reciprocal engagement (Hart & Risley, 1992), parent–child synchrony (Treyvaud et al., 2011), and sensitivity and positive engagement (Blair et al., 2011; Tamis-LeMonda et al., 2004; Treyvaud et al., 2011; van Bakel & Riksen-Walraven, 2002; Wijnroks, 1998). Experimental studies designed to increase parental support and responsiveness have further demonstrated the importance of early caregiving on children's cognitive ability (Landry, Smith, & Swank, 2006; Smith, Landry, & Swank, 2006), thus providing both correlational and causal evidence in support of sensitive caregiving effects on children's cognitive development.

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Why might parental sensitivity be specifically relevant for children's early cognitive development? To answer this we must consider the many functions of parental sensitivity, including providing both support and care for the child during periods of distress as well as fostering confidence and agency for the child during periods of non-distress (Sroufe, 1978). Parents who are sensitively engaged with their young children provide a stimulating interactive context and a supportive emotional climate for children. Such a dynamic facilitates the child's exploration of her surroundings, a developmentally appropriate pattern of reciprocal verbal and non-verbal exchanges, and reward in response to achievement as well as encouragement in response to failure (Blair et al., 2011; Mills-Koonce, Appleyard, Barnett, Putallaz, & Cox, 2011; Mills-Koonce et al., 2011). Theoretically, the security and confidence afforded to children with sensitive and supportive parents promote well-regulated and self-initiated social and non-social experiences (Sroufe, Egeland, Carlson, & Collins, 2005), effectively increasing the amount of stimulating experiences that foster cognitive development and the depth of processing applied to these experiences (Piaget, 1952). As such, independent of other structural supports, a sensitive caregiving environment likely provides an optimal emotional context for children's early brain maturation and cognitive development (Bernier, Carlson, & Whipple, 2010).

Although, to date, most studies of parental sensitivity have focused exclusively on mothers, a growing research literature has identified paternal caregiving correlates of children's cognitive development. Studies of mother and father caregiving provide evidence for variation and similarity across mothers' and fathers' parenting behaviors with their young children (e.g., Barth & Parke, 1993; Clarke-Stewart, 1980; Cox, Paley, Payne, & Burchinal, 1999; Lamb, 1978; Paquette, 2004; Parke, 1996; Weinraub, 1978; Youngblade & Belsky, 1992). For example, several domains of parenting have been described as "more common" among fathers than mothers, including teasing (Labrell, 1994), rough-and-tumble play (Fletcher, St. George, & Freeman, 2013; Paquette & Dumont, 2013; Parke, 1996), and greater encouragement of risk-taking and sex socialization (Fitzgerald, 1977; Power, 1981). However, research also identifies several points of convergence across parents, including the exploration during play (Power, 1985), developmentally appropriate styles of communication (Belsky, 1984), and general levels of sensitive caregiving (Notaro & Volling, 1999).

The current study relies on family systems theory to better understand how relationships and inter-dependencies of processes within the family function to link early experiences (i.e., maternal and paternal sensitivity) with later child outcomes (i.e., child cognitive functioning) (Cox & Paley, 2003; Minuchin, 1985). As operationalized in this study, sensitive parenting reflects active emotional, affective, and behavioral engagement with the child characterized by high levels of responsiveness, positive reinforcement and praise, stimulation and animation. This quality of interaction has been associated with more elaborate play and communication during both mother–child (Baumwell, Tamis-LeMonda, & Bornstein, 1997; Tamis-LeMonda, Bornstein, & Braumwell, 2001) and father–child interactions (Shannon, Tamis-LeMonda, London, & Cabrera, 2002). Using comparable measures, Tamis-LeMonda et al. (2004) reported that positive parenting among mothers and fathers accounted for independent variation in children's cognitive abilities concurrently and 1 year later at 36 months. Although it was posited that fathers' and mothers' levels of positive parenting were having both direct and indirect effects on children's outcomes over time, this was not explicitly tested. Similarly, Cabrera, Shannon, and Tamis-LeMonda (2007) reported both comparable levels of positive parenting across mothers and fathers as well as independent associations between concurrent levels of paternal and maternal positive parenting and children's cognitive abilities as assessed by the Bayley Scales of Infant Development (BSID-II) at 24 and 36 months of age. Although some studies used similar measures of sensitive parenting across mothers and fathers, none tested the measurement equivalency of this construct across parents, nor did they explicitly test for indirect effects of parenting across time.

Using a person-oriented approach, Ryan, Martin, and Brooks-Gunn (2006) reported a common clustering of parenting variables across mothers and fathers that were used to create typologies of supportive and non-supportive parents. Cross-classification of these clusters created groups characterized by two supportive parents, only one supportive parenting (either mother or father), or no supportive parents. Analyses further indicated that the combined effects of mothers and fathers were stronger than their individual effects on children's cognitive development, but also that the effects of having one supportive parent are greater than no supportive parent regardless of the parent's sex (Ryan et al., 2006). A follow-up to this study also reported that additive effects of multiple supportive parents, again independent of parent sex, were found for both math and language achievement (Martin, Ryan, & Brooks-Gunn, 2007). These person-oriented analyses identify distinct associations between maternal and paternal supportive parenting and children's cognitive outcomes, as well as suggest that these associations may be comparable in strength across mothers and fathers.

Independent and spillover effects of parenting across mothers and fathers

Research on the associations between children's cognitive development and mothers' and fathers' parenting may imply that the strengths of these associations are comparable, but few studies have explicitly tested these assertions. One notable exception to this is the work of Adamsons and Buehler (2007), who systematically examined parental acceptance and found no evidence for equivalency of measurement across mothers and fathers with their self-reported measure. To our knowledge, no other study has examined this issue using observational measures of common parenting dimensions across mothers and fathers. This is important because, even among common dimensions of caregiving quality, there are likely to be separate contributions of mothers and fathers due to additional independent (although correlated) qualities of parenting between mothers and fathers (Barnett, Deng, Mills-Koonce, Willoughby, & Cox, 2008), as well as differences in mean levels of a given caregiving dimension across parents. For example, mothers and fathers may parent in a comparable way but spend different amounts of time with the child or interact with the child in unique contexts that differentially affect the nature of their influence on their child. Alternatively, fathers may be warm and supportive even in the absence of such characteristics in the mother (Cabrera, Tamis-LeMonda, Bradley, Hofferth, & Lamb, 2000), resulting in independent but dissimilar effects of each parent on children's development. Furthermore, because mothers, fathers, and children function within a broader family system of multiple dyadic and triadic interactions, it is possible that the effects of one individual on another may be mediated by a third family member. For example, fathers' early caregiving may indirectly influence a child via spillover effects on the mother's caregiving behavior. Another possibility is that mothers' early caregiving may directly influence children's early behaviors, which in turn reciprocally influence fathers' caregiving over time. Thus, the interdependence of maternal and paternal caregiving and the transactional dynamics between parents and children over time may result in multiple mechanisms by which mothers, fathers, and children each make contributions to children's early cognitive development.

Ideally, to examine the independent associations between mothers' and fathers' sensitive parenting and children's cognitive development an appropriate measurement model of sensitive parenting across parents is necessary. Three steps are necessary to accomplish this goal. First, mother–child and father–child interactions should be similar enough that common dimensions of parenting behaviors can be observed across both interactive contexts. Second, the coding of these behaviors must be conceptually and operationally consistent across mothers and fathers. Third, analytic procedures are needed to explicitly test whether latent constructs of caregiving behavior across parents are