



A comparison of maternal sensitivity and verbal stimulation as unique predictors of infant social–emotional and cognitive development

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ABSTRACT

Although maternal sensitivity has been shown to influence social–emotional development, the role of verbal stimulation on infant developmental outcomes has received less exploration. Recent research has focused on intentional behaviors within the context of a mother–infant interaction as a critical influence and as distinct from sensitivity. In this investigation 6377 mother–infant dyads participated in a teaching task as part of the sample from the Early Childhood Longitudinal Study Birth Cohort (ECLS-B). Analyses focused in deciphering the role of maternal sensitivity and verbal stimulation as contributors to the infant's social–emotional (S–E) and cognitive (Cog) development. We further hypothesized that inclusion of infant age as a moderator of maternal behaviors would illuminate any differences between younger and older infants. *Results:* For the infant's S–E development, our hypothesis that maternal sensitivity would be a stronger predictor than verbal stimulation was not supported; nor did we find support for our hypothesis that the association would be moderated by age. For Cog development, only verbal stimulation had a direct positive effect on the infant's cognitive ability; our findings for moderation showed that mothers spoke more to older infants than younger infants. *Conclusion:* Identification of specific maternal behaviors associated with infant outcomes informs the child development field, and also provides strategies for early intervention to assist mothers with developing or maintaining a consistent relationship that includes sensitivity and verbal stimulation.

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1. Introduction

It is well accepted that the family provides important relational contexts for infant and child development, and that positive parent–child interactions are critical for optimizing developmental outcomes, including social–emotional and cognitive growth. Because the mother–child relationship is uniquely close and long-term and has proven to significantly influence developmental outcomes, it has been under close scrutiny. Interest has often focused on the mother's health or psychological mood (Carter, Garrity-Rokous, Chazan-Cohen, Little, & Briggs-Gowan, 2001; Field, 1992) in explaining poor outcomes for children throughout their lives. Alternatively, others have investigated the specifics of the mother's cognitions when interacting with her infant (Meins, Fernyhough, Fradley, & Tuckey, 2001) and the impact of her verbal and nonverbal behaviors in stimulating the growth and development of her child (Landry, Smith, Miller-Loncar, & Swank, 1997). One area of research focuses on observations of mother–child interactions and caregiving skills such as feeding, free play, teaching strategies, as well as the mother's behaviors to soothe the infant during stressful and non-stressful events (Beckwith & Rodning, 1996;

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Field, Guy, & Umbel, 1985; Landry, Smith, & Swank, 2006; McElwain & Booth-LaForce, 2006). A common theme among these studies is the significance of maternal sensitivity and verbal interactions within the mother–child relationship.

Defining behaviors associated with maternal sensitivity, Meins (1997) purported that maternal behaviors must be appropriate for the situation; thus her research focused on the importance of the mother's cognitions, and in particular her interpretation of her infant's actions to determine the appropriateness of her behavior. Of the five sensitivity behaviors indicated by Ainsworth, Blehar, Waters, and Wall (1978), Meins (1997) believed that behaviors that promoted social and emotional development were (1) responding promptly to a cry recognized as signaling distress; (2) comforting the infant when upset; and (3) being available for interaction, whereas the behaviors (4) interpreting the infant's actions as meaningful; and (5) treating the infant as an intentional agent promoted the development of cognitive growth in the infant. Tying back into other's research, the first three behaviors can be seen to reflect responsiveness, whereas the latter two may be seen to reflect contingency as suggested by Landry, Swank, Assel, Smith, and Vellet (2001).

It is our hypothesis, that within any context a mother exhibits a variety of behaviors, and unpacking the meaning and impact of each type of behavior as a unique influence on a specific infant outcome is difficult. Rather we believe that maternal behaviors influence multiple outcomes such that maternal sensitivity may also contribute to cognitive development and verbal stimulation may also contribute to social–emotional development. The purpose of this manuscript is to explore the impact of maternal sensitivity and verbal stimulation on two infant outcomes (i.e., social–emotional and cognitive development), but also to explore if either of the two maternal behaviors have differing impact based on infant age; thus we tested for moderation. This study involves a secondary analysis of the Early Childhood Longitudinal Study Birth Cohort (ECLS-B) national study of parents and their infants born during 2001. Findings from this study will contribute to the child development literature as well as to inform practitioners about the impact of sensitivity and verbal stimulation to infant development.

To develop our hypotheses, we begin with a review of the literature regarding the influence of maternal behaviors on infant social–emotional and cognitive development. In addition to maternal behaviors, we explore the findings that infant age may influence maternal behaviors resulting in discontinuity across infant developmental ages.

1.1. Maternal behavior as a foundation for infant social–emotional development

Numerous studies support the notion that sensitive maternal behaviors influence the social–emotional development of the infant through the development of an initial relationship based on trust that is necessary for reciprocal maternal–infant interactions (e.g., Landry et al., 2001). Two of the more commonly identified aspects of sensitive behavior include responsiveness and contingency. Observations from an intervention study (Landry et al., 2006) showed responsive mothers were prompt, sensitive, contingent and treated their infants as capable of intentions supporting previously defined aspects of sensitive behavior.

The second facet of maternal sensitivity focuses on the mother's contingent behavior during reciprocal interactions and basic caregiving. Contingent behavior suggests that the mother acknowledges and responds to the infant's needs within a reasonable period of time after the infant signals (e.g., crying, calling, or crawling after) (Eshel, Daelman, de Mello, & Martines, 2006; Landry et al., 2001; Smith, Landry, & Swank, 2006). Researchers focusing on social emotional development suggest that maternal contingent and responsive behaviors serve as a model for the child's own emotional development and regulation of emotions (McElwain & Booth-LaForce, 2006) and are important for promoting social development by emphasizing the rules of socialization within the interaction (Landry et al., 2006). Therefore, in this study, maternal sensitivity includes both verbal and nonverbal behaviors that are responsive and contingent in nature.

1.2. Maternal behavior associated with infant cognitive development

The amount of maternal sensitivity, responsiveness, and contingent behavior, as well as verbal stimulation offered by the mother to her infant, has been shown to have a positive association to both language development and overall cognitive ability (Beckwith & Rodning, 1996; Eshel et al., 2006; Field et al., 1985; Landry et al., 2006; Lemelin, Tarabulsy, & Provost, 2006; Smith et al., 2006). Factors associated with the amount of verbal communication between a mother and her infant in promoting cognitive growth include maternal age, education, culture and ethnicity, sensitivity, and verbal stimulation or imitation (Eshel et al., 2006; Field, 1992; Laosa, 1980; Paavola, Kunnari, & Moilanen, 2005).

Conversational or descriptive dialogue from the mother to her infant lays the foundation for dyadic interactions and for contributions to healthy cognitive outcomes (Landry et al., 2006), including language development. Early maternal dialogue has been shown to be a function of the mother's educational level, with mothers having fewer years of education being less verbal with their infant, or not verbalizing to them until the infant began vocalizing in the latter half of the first year (Beckwith & Rodning, 1996; Berlin, Brady-Smith, & Brooks-Gunn, 2002; Landry et al., 2001, 2006).

Salient to our study are the findings of maternal–infant interactions, and specifically mothers who used verbal behaviors that encouraged and maintained the infant's attention towards an object or task, or utilized a directive skill in teaching promoted infant vocabulary and overall cognitive ability (Landry et al., 1997, 2006; Ruddy & Bornstein, 1982). Further, researchers focusing on how and what the mother says have found impacts to cognitive development and emotion understanding (Taumoepeau & Ruffman, 2006, 2008). Verbal behaviors within the current study include directions, descriptions, and encouraging words for the infant to continue, and are representative of the types of verbal stimulation utilized during the teaching task.

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