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Longitudinal effects of contextual and proximal factors on mother-infant interactions among Brazilian adolescent mothers



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ABSTRACT

Adolescent mothers often come from vulnerable backgrounds which might impact the quality of both maternal and infant behavior. Despite the negative impact of adolescent motherhood for maternal and infant behavior, social support may decrease the risks and promote maternal behavior toward the infant. The aim of this study was to investigate longitudinally the effects of proximal (maternal behavior) and distal (mother's perceived social support) variables on infant development in a sample of Brazilian adolescent mothers and their infants. Thirty-nine adolescent mothers ($M_{\text{age}} = 17.26$ years; $SD = 1.71$) were observed interacting with their infants at 3 and 6 months postpartum and reported on social support. Results revealed that maternal and infant behavior were associated within and across times. Mothers' perceived social support at 3 months had an indirect effect on infant behavior at 6 months, totally mediated by maternal behavior at 6 months. Our findings revealed the mutual influence between maternal and infant behavior, revealing a proximal process. The results also underscored the importance of the passage of time in the interplay between mother-infant interactions and their developmental context.

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1. Introduction

Adolescent motherhood often occurs in impoverished families, which affects maternal competence and, consequently, the quality of infant caregiving (e.g., Turley, 2003). In Brazil, 4% of adolescents between the ages of 15 and 19 have given birth at least once (WHO, 2009). The highest rates of adolescent pregnancy occur in the most impoverished areas of the country (Brazilian Ministry of Health [BMH], 2009), which may impact both maternal behavior and infant development. Taking into account the mutual influence between the individual and context in affecting developmental outcomes (e.g., Bronfenbrenner, 2001), the current study focused on the relations between social support, maternal, and infant behaviors over time in a Brazilian sample of adolescent mothers living in vulnerable conditions.

Adolescent motherhood is characterized by a lack of resources, such as insufficient social support, access to health services, and information about infant nursing (Carniel, Zanolli, Almeida, & Morcillo, 2006; Diniz & Koller, 2012; UNPF, 2013). These background characteristics are seen as a major challenge to maternal competence, which, in turn, impacts infant

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development (e.g., Jaffee, Caspi, Moffitt, Belsky, & Silva, 2001; Klein & Committee on Adolescence, 2005; Moore & Brooks-Gunn, 2002; Turley, 2003). Because, maternal and infant behavior occur in a specific context, affecting and being affected by it (Bronfenbrenner, 2001), developmental outcomes are not seen as a function of individual agency, but as a function of the interplay between individual and context (Sameroff & Mackenzie, 2003). Therefore, mother-infant interaction patterns are influenced by individual characteristics, such as maternal sensitivity and infant temperament, and by environmental characteristics (e.g., social support; Belsky, Gilstrap, & Rovine, 1984).

In light of the convergence between individuals and their environment for determining infant development (e.g. Cabrera, Fagan, Wight, & Schadler, 2011; Tarabulsky et al., 2005), we conducted the present study investigating how adolescent mothers and their infants mutually influenced each other over time and how contextual factors, specifically the mother's perceived social support, predicted mother-infant interactions. The bioecological model captures the mutual influence of these proximal (i.e., mother-infant interaction) and distal (i.e., social support) factors that affect both maternal and infant behavior (Bronfenbrenner, 2001).

Previous research has found a negative association between challenged environments and the quality of mother-infant interactions (e.g., Cabrera et al., 2011; Evans, Boxhill, & Pinkava, 2008). For instance, adolescent mothers were often less contingent in response to infant cues and more intrusive (Levine, Coll, & Oh, 1985). Also, adolescent mothers vocalized less and engaged less in stimulating interactions with their infants (e.g., Fouts, Roopnarine, Lamb, & Evans, 2012; Klein & Committee on Adolescence, 2005; Levine et al., 1985; Lordelo, Fonseca, & Araújo, 2000). In addition, they had children with more behavioral and emotional disruptions (Lindhiem, Bernard, & Dozier, 2011).

Social support has been shown to improve maternal behaviors, and consequently, interactive behavior with the infant (e.g., Devereux et al., 2009; Fouts et al., 2012). In Brazil, adolescent mothers are often from disadvantaged backgrounds with multiple stressors, in which social support might play an important role, helping them to deal with personal difficulties and with infant caregiving. Social support may decrease the effect of environmental stressors, thereby improving the maternal-infant relationship (e.g., Devereux et al., 2009; Lanzi, Bert, Jacobs, & The Centers for the Prevention of Child Neglect, 2001). A meta-analysis revealed that the relation between social support and the quality of adolescent mothers' interactions with their infants had a medium-effect size (Clemmens, 2001).

Even though social support appears to be an important contributor to mother-infant interactions, especially within vulnerable contexts (e.g., Clemmens, 2001; Devereux et al., 2009; Gee & Rhodes, 2007), little is known about mother-infant interaction in non-western adolescent mothers living in impoverished contexts (e.g., Lounds, Borkowski, Whitman, Maxwell, & Weed, 2005), which represent 90% of infants worldwide (Tomlinson & Swartz, 2003). Thus, it is important to investigate non-western mothers and their infants (e.g., Tomlinson & Swartz, 2003) because their specific personal and contextual characteristics might impact the maternal role and developmental processes differently, in comparison to western white-middle class samples which are the predominant focus in most investigations (Keller et al., 2006). Furthermore, taking into account that adolescent motherhood in Brazil occurs in disadvantaged backgrounds, it was important to investigate how maternal behavior mediated external factors, such as social support, on infant developmental outcomes.

Evidence of previous research worldwide demonstrated the influence of mothers' social support on infant development (e.g. Clemmens, 2001; Evans et al., 2008). For instance, a study examining the relation between mothers' and fathers' perceptions of social support and children's behavior problems at age 4 showed that parents with more social support rated their children with fewer behavior problems (Visconti, Saudino, Rappaport, Newburger, & Bellinger, 2002). Similarly, Herwig, Wirtz, and Bengel (2004) revealed that parental social support indirectly predicted children's internalizing and externalizing behavior problems. Nonetheless, many of these studies relied on parent reports to assess children's behavior, whereas the current report used home-based observations of mother-infant interaction. On one hand, social support may have a direct effect on infant development because those offering support to parents may also be helping with infant care. On the other hand, as evidenced by research (e.g., Evans et al., 2008; Herwig et al., 2004), social support indirectly affects infant behavior through its association with the mother's behavior and, in turn, the mother-infant interaction.

The current study used observational methods of mother-infant interaction at 3 and 6 months postpartum. We tested a model to investigate longitudinally the effects of proximal (maternal behavior) and distal (mother's perceived social support) variables on infant development in a sample of Brazilian adolescent mothers and their infants. The aims of this study were: (1) to examine the relation between maternal behavior (proximal variable) and infant behavior (developmental outcome) within and across times; and (2) to examine relations between maternal perceived social support (distal variable) and infant behavior (developmental outcome). We hypothesized that: (1) maternal behavior has a positive direct association with infant behavior within and across times; (2) maternal social support has a positive association with both maternal and infant behavior; and (3) the association between maternal social support and infant behavior is totally mediated by maternal behavior. These hypotheses were based on the ecological model that claims the effect of distal environmental factors (e.g., social support) on developmental outcomes (e.g., infant behavior) occurs through proximal processes (e.g., mother-infant interaction and maternal behavior).

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