



Mother-child attachment styles and math and reading skills in middle childhood: The mediating role of children's exploration and engagement

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ABSTRACT

Research suggests that early mother-child attachment styles are predictive of cognitive skill development in middle childhood. Yet, little work has considered the differential associations of varying attachment styles on reading and math skills in middle childhood, and the mechanisms explaining those relationships across time. Using data from the first three phases of the National Institute of Child and Human Development Study of Early Child Care and Youth Development, this study examined associations between early mother-child attachment styles and math and reading skill development in middle childhood (i.e., ages 54 months to fifth grade). In addition, using a multilevel mediation approach, we considered children's task engagement and engagement/exploration in the classroom as mechanisms explaining gains in cognitive skills. Findings revealed that insecure/other attachment predicted lower average levels of reading and math skills in fifth grade, while ambivalent attachment was associated with lower average levels of math skills in fifth grade. Children's task engagement partially mediated associations between insecure/other attachment and reading skills, as well as associations between ambivalent attachment and math skills. Task engagement also partially mediated associations between insecure/other attachment and math skills in middle childhood. Implications for attachment theory and educational practice are discussed.

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1. Introduction

Associations between insecure mother-child attachment patterns and social skill difficulties in middle childhood have been documented in numerous large-scale studies (Bergin and Bergin, 2009; Greenberg, 1999). The explanatory mechanisms linking attachment and social skills are similarly well studied and understood. In comparison, limited research exists on mother-child attachment styles and *cognitive skills* in middle childhood. Yet, associations between early mother-child attachment and later cognitive outcomes would be expected given that children's attachment relationships with their mothers relate to their abilities to engage with and explore their world, and consequently learn necessary information from their environments (Bretherton, 1985). Given the salience of academic skills in middle childhood for suc-

cess in elementary school and beyond (Kautz, Heckman, Diris, Ter Weel, & Borghans, 2014), it is critical to understand the potential role that early attachment relationships have on cognitive skill development during middle childhood. Moreover, by identifying potential mechanisms linking early attachment and cognitive outcomes, researchers can inform efforts to develop interventions and support cognitive development. Using a large national longitudinal dataset, the current study examines relations between early mother-child attachment styles and math and reading skills in middle childhood, and uses a rigorous framework to consider whether children's engagement and exploration mediate those associations.

1.1. Attachment theory and early attachment styles

Attachment theory posits that children develop attachment relationships with primary caregivers during the first years of life. Within these relationships, children seek feelings of safety and security (Bowlby, 1980). Attachment relationships compose a motivational control system that regulates children's wishes to maintain proximity to caregivers and explore the environment. When chil-

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dren are anxious, their attachment systems are activated, and their exploratory systems are deactivated. In contrast, when children are comfortable, their attachment systems are deactivated and their exploratory systems activated, leading to use of attachment figures as secure bases from which to explore the environment (Ainsworth, Blehar, Waters, & Wall, 1978).

All children, except those who experience severe neglect, develop attachments to their primary caregivers, typically mothers. However, children demonstrate varying patterns of attachment that may reflect differences in caregiver sensitivity and responsiveness (Ainsworth et al., 1978). Children's attachment styles may then affect how their caregivers interact with them. In this way, attachment relationships are inherently bidirectional. At the most basic level, children develop either secure or insecure attachments. Secure children trust that they will be attended to in times of need and, thus, effectively use caregivers as secure bases from which to explore their surroundings. In contrast, caregivers of insecure children tend to be inappropriately responsive in regards to children's attachment-related behaviors. Insecure children do not trust that they will receive support when threatened. Accordingly, insecure children's attachment systems are more frequently activated and their exploratory systems are more deactivated than those of secure children. Insecure children are not as effective as secure children in their use of caregivers as secure bases. Yet, there is variation in the behaviors of insecure children's caregivers and in insecure children's attachment strategies. Thus, several subcategories of insecure attachment have been identified among children: ambivalent, avoidant, controlling, and insecure/other (Cassidy, Marvin, & the MacArthur Working Group on Attachment, 1992).

Caregivers of ambivalent children tend to be inconsistently responsive. As such, ambivalent children are hypervigilant to signs of impending caregiver unavailability and are dependent and clingy with caregivers to ensure their caregivers' physical proximity in times of stress and/or danger (Ainsworth et al., 1978; Cassidy & Berlin, 1994; Weinfeld, Sroufe, Egeland, & Carlson, 2008). Ambivalent attachment correlates with inconsistent caregiver availability. Avoidant attachment, in contrast, is associated with caregiver unavailability. More specifically, avoidant children do not expect to receive caregiver support when mildly stressed. Thus, they often inhibit affect, avoid extensive contact with caregivers when mildly stressed and focus on the immediate environment to prevent feeling rejected by caregivers (Weinfeld et al., 2008).

More recent research with preschool children has identified controlling and insecure/other styles of attachment, which are both types of disorganized attachment (Teti, 1999). Controlling and insecure/other attachment styles are associated with fearful caregiver behaviors (Main and Hesse, 1990). Controlling children manage fearful behavior by controlling their caregivers, taking charge over caregivers by assuming either a punitive or a caregiving role (Teti, 1999). Through controlling behaviors, they are capable of regulating their caregivers' fearful actions. Controlling children, however, do have organized behaviors to get some of their attachment needs met and are thus somewhat able to use their caregivers as secure bases (Teti, 1999; Main & Cassidy, 1988). Children with controlling attachments have models of the mother as someone capable of being manipulated, and insecure/other children have disjointed and unintegrated models (Moss, Cyr, Bureau, Tarabulsky, & Dubois-Comtois, 2005; Teti, 1999). Generally, children use these models to organize behavioral strategies to regulate their emotions, and to ensure that at least some of their attachment needs are met. However, children with insecure/other attachments appear to lack a representational strategy to regulate their emotions effectively or to develop stable and enduring feelings of safety and security (Teti, 1999). As such, insecure/other children may exhibit anomalous and unorganized attachment behaviors, which appear to prevent them

from using caregivers as secure bases (Humber and Moss, 2005; O'Connor, Scott, McCormick, & Weinberg, 2014).

Accordingly, the controlling attachment pattern may be more optimal than the insecure/other pattern (Moss, Bureau, St-Laurent, & Tarabulsky, 2011; Teti, 1999). For example, Moss, Cyr, & Dubois-Comtois (2004) found that controlling children scored higher on dyadic coordination and communication with their mothers than did insecure/other children. Furthermore, the insecure/other pattern is more prevalent than the controlling patterns among high-risk samples, including maltreated preschool (Cicchetti and Barnett, 1991) and orphanage-reared, adopted children (O'Connor et al., 2003).

1.2. Attachment and cognitive development

Relative to children with insecure mother-child attachments, children with secure attachments are more willing to approach and persist in tasks, better able to elicit and accept their caregivers' assistance, and more likely to experience a greater flow of information between themselves and their caregivers (De Ruiter and Van IJzendoorn, 1993). In addition, security of attachment is hypothesized to affect children's metacognitive processes, or knowledge about cognition and regulation of cognition. Secure internal working models of attachment are coherent, noncontradictory, and nondefensive, which are more likely to relate to successful metacognitive monitoring. Given these advantages, theory suggests that children with secure attachments are likely to exhibit higher levels of cognitive skills than their insecure peers (De Ruiter and Van IJzendoorn, 1993).

There is a relatively large empirical literature demonstrating associations between attachment and cognitive skills including ability, intelligence, memory, and reasoning in samples of children ages two to five (Spieker, Nelson, Petras, Jolley, & Barnard 2003). Additional work has considered associations between specific insecure attachment styles and cognitive outcomes in middle childhood. (Aviezer, Sagi, Resnick, & Gini, 2002; Jacobsen and Hofmann, 1997; Kerns, Klepac, & Cole, 1996; Kerns, Tomich, Aspelmeier, & Contreras, 2000; Moss and St-Laurent, 2001; O'Connor & McCartney, 2007). Most recently, West, Matthews, and Kerns (2013) found that early ambivalent and disorganized attachments were associated with a composite measure of cognitive ability, composed of a combination of an achievement and early cognitive ability measure, in third and fourth grade.

Additional research, however, is needed to determine whether there are links between specific attachment styles and reading and math skills across the full period of middle childhood. Indeed, the majority of past studies have measured cognitive skill outcomes with an IQ test outcome, or an aggregate measure of school performance across varied domains of learning. Yet, genetic factors are the primary predictors of children's IQ (Lemelin, Tarabulsky, & Provost, 2006). As such, it may not be completely accurate to identify links between attachment and IQ and argue that such a finding is similar to finding an association between attachment styles and cognitive skills. While IQ generally describes a score on a test that rates cognitive ability relative to the general population, cognitive abilities more broadly represent the brain-based skills and mental processes needed to carry out tasks (Nisbett et al., 2012). In their review of mother-child attachment and cognitive skills, De Ruiter and Van IJzendoorn (1993) argued that the research between attachment quality and IQ was the least compelling and unequivocal, and attachment quality was more strongly related to behaviors and general problem-solving skills across extant literature. Assessing cognitive outcomes with a standardized achievement measure may thus be warranted.

In this vein, some studies have considered how different attachment styles may predict cognitive skills, operationalized

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