



Maternal psychological functioning and children's school readiness: The mediating role of home environments for African American children

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ABSTRACT

Decades of educational research has documented an achievement gap in kindergarten reading and math achievement between African American children and their European American counterparts. Research has also shown that specific parenting practices (e.g., home literacy involvement) have the potential to narrow school readiness gaps by at least half. The current study examined whether and how maternal depression and parenting stress may influence specific parenting practices, as well as whether maternal warmth, home learning stimulation and cultural socialization mediated the relation between maternal depression, parenting stress, and children's kindergarten reading and math achievement. Path analyses revealed a direct negative effect of maternal depression and parenting stress on maternal warmth, home learning stimulation, and cultural socialization. Home learning stimulation emerged as an important mediator between maternal parenting stress and math achievement. Further, maternal warmth mediated the relation between maternal depression and reading achievement. Implications for early childhood research, practice and policy are discussed.

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A successful transition to kindergarten can set the stage for enhanced high school performance (Pianta, Cox, & Snow, 2007; Rimm-Kaufman & Pianta, 2000). In fact, research has demonstrated that kindergarten reading and math skills are the most salient predictors of high school achievement and success (Duncan et al., 2007; Rouse & Fantuzzo, 2009). Early childhood studies have shown that the mother–child relationship and proximal processes of parenting account for a significant amount of variance in children's reading and math skills in kindergarten (Brooks-Gunn & Markman, 2005; Hill, 2001). Of particular interest to researchers and policy makers are the gaps in reading and mathematics achievement demonstrated by many African American children at kindergarten entry (Haskins & Rouse, 2005). This is especially important given that early gaps in achievement tend to increase over time (Alexander, Entwisle, & Olson, 2001) and poor performance in kindergarten forecasts poorer performance throughout the academic and life trajectory (Alexander, Entwisle, & Dauber, 1993; Baydar, Brooks-Gunn, Furstenberg, 1993; Duncan et al., 2007; Gutman, Sameroff, & Cole, 2003).

Parenting including the mother–child relationship and quality of the home environment are salient predictors of African American children's school readiness (Baker, Cameron, Rimm-Kaufman, & Grissmer, 2012). Bronfenbrenner's (1986) ecological theory argues that warm, cognitively stimulating home environments set the

stage for optimal academic achievement. Research on early parenting and child development in mostly white, middle class samples has established that specific home-based parenting practices (e.g., parent–child reading) along with the emotional climate of homes (e.g., maternal depression and parenting stress) have a lasting impact on children's development and preparation for school (Cabrera, Beeghly, & Eisenberg, 2012; Downer & Pianta, 2006). The few specific studies that have focused exclusively on African American families have found that warm, cognitively stimulating home environments are critically important for building a strong foundation for early school success (Hill, Mann, & Fitzgerald, 2011). Further, there is emerging evidence that cultural socialization practices are also important features of parenting in African American families. Research has shown that mothers who share information about their ethnicity, race, and cultural heritage have children with better academic skills than mothers who do not engage in cultural socialization (Coard, Foy-Watson, Zimmer, & Wallace, 2007; Hale-Benson, 1990; Hill et al., 2011; O'Brien-Caughy, O'Campo, Randolph, & Nickerson, 2002). What is less well understood is whether African American mothers' psychological functioning (e.g., depression and parenting stress) is related to the likelihood that mothers will engage in warm interactions (e.g., hugs and kisses), cognitive stimulation (e.g., shared book reading) and cultural socialization (e.g., discussing cultural heritage) in their homes. Even less is known about these associations among African American mothers from diverse socioeconomic backgrounds because much of the previous research with African American families has focused on low-income samples (Fantuzzo, McWayne, Perry,

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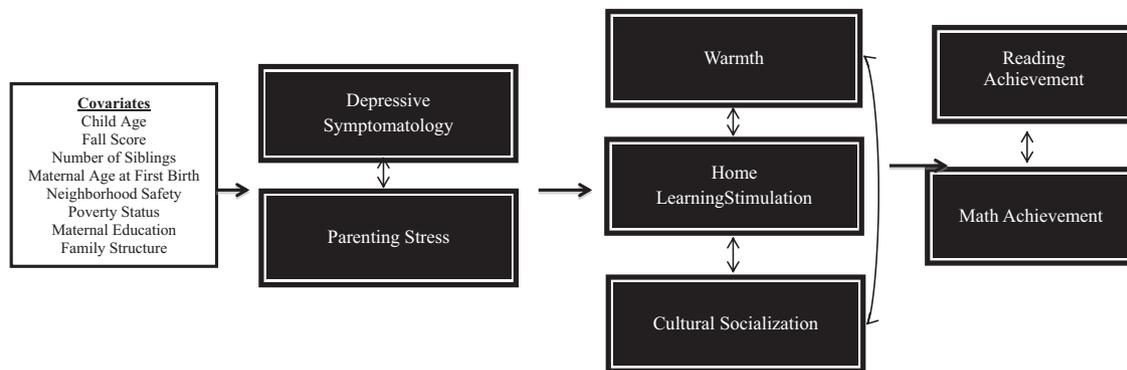


Fig. 1. Conceptual model (the direct link between depressive symptomatology and parenting stress and children's reading and math achievement is not depicted).

& Childs, 2004; Connell & Prinz, 2002). Because parenting is a dynamic, multidimensional concept and African American families are socioeconomically diverse, it is important to understand not only how African American mothers behave with their children but also why. It is equally important that research move away from a homogeneous, deficit view of African American families (e.g., low-income) to better understand child development across the socioeconomic spectrum (Cabrera et al., 2012).

The present study used a family-centered ecological lens to examine maternal psychological functioning, parenting practices, and school readiness in a nationally representative sample of African American mothers and their children. In the present study, school readiness was operationalized as children's kindergarten reading and math achievement. This study advances knowledge concerning the relation between maternal depression, parenting stress, and school readiness in African American families in three novel ways. First, there are a number of studies that have linked maternal depression and parenting stress to child outcomes, however, much of this research has focused on white, middle class families with less emphasis on ethnic minority families (Amato & Fowler, 2002; Cabrera et al., 2012). Second, research that has examined parenting practices among African American mothers in relation to child achievement has too often focused on small samples of low-income families rather than families from diverse socioeconomic backgrounds (Britto & Brooks-Gunn, 2001; Brody & Flor, 1997). Third, to our knowledge no research has specifically examined African American mothers' psychological functioning, warmth, home learning stimulation and cultural socialization practices in relation to children's school readiness. The present study extends previous research by examining the relation between African American mothers' psychological functioning, parenting practices, and school readiness in a large, national sample of African American families from diverse socioeconomic backgrounds. Further, we also examined whether maternal warmth, home learning stimulation, and cultural socialization mediated the pathway between maternal psychological functioning and children's kindergarten reading and math achievement (see Fig. 1 for our conceptual model).

1. Theoretical framework

The present study is guided by bio-ecological and family stress theories. Bronfenbrenner's bio-ecological theory posits that home environments represent the most salient and enduring context for development during the first five years of life. Within this context, proximal processes such as mother-child interactions can attenuate or enhance opportunities for optimal academic achievement (Bronfenbrenner, 1979, 1986; Bronfenbrenner & Morris, 1998). In relation to school readiness, bio-ecological theory suggests that

experiences within the home often facilitate the emergence of academic skills that lay the foundation for kindergarten success. For example, activities that reflect the nature (e.g., shared book reading) and quality (e.g., warm, responsive) of early parenting have been linked to enhanced reading and math performance (Baker et al., 2012; Christian, Morrison, & Bryant, 1998; Downer & Pianta, 2006; McWayne, Hampton, Fantuzzo, Cohen, & Sekino, 2004; Iruka, 2009). Thus, the application of bio-ecological theory allows researchers to apply a family-centered ecological lens to examining proximal processes (e.g., parenting) that contribute to child development while also considering the confluence of school readiness factors, such as family income and number of siblings (Rimm-Kaufman & Pianta, 2000).

This study is also guided by family stress theory. Family stress theory contends that diminished maternal psychological functioning and socioeconomic strain can have a negative influence on children's development. Seminal research with small samples of white and African American mothers suggests that diminished psychological functioning may minimize parents' abilities to engage in nurturing, responsive interactions with their children (Conger, McCarty, Yang, Lahey, & Kropp, 1984), which in turn may negatively impact children's academic achievement (Ceballo & McLoyd, 2002; Conger et al., 1992; Conger, Ge, Elder, Lorenz, & Simons, 1994; Linver, Brooks-Gunn, & Kohen, 2002; Mistry, Vandewater, Huston, & McLoyd, 2002). Family stress theory also posits that positive parenting strategies can serve as protective factors in African American families facing multiple risks (Conger et al., 2002), which may lead to more optimal child outcomes despite the presence of risk. As such, this study is guided by bio-ecological and family stress theory. These frameworks provide a useful foundation for understanding the influence of maternal psychological functioning (depression and parenting stress) through the proximal process of parenting (warmth, home learning stimulation, cultural socialization) to child outcomes (reading and math) above and beyond the contribution of demographic factors (e.g., family income, maternal education, family structure). This is particularly relevant for African American children because research has shown that African American children are more likely to be exposed to demographic risk factors than other groups (McLoyd, 1998).

2. Psychological functioning

2.1. Maternal depression

Parental depression is usually reflected in parent reports of their levels of sadness, irritability, and poor moods. In this study, we defined depression as a myriad of parent-reported depressive symptoms rather than the presence of clinical depression. Studies have shown that mothers who report higher levels of

depressive symptomatology have less positive parenting practices as well as children with poorer cognitive skills in elementary school (Augustine & Crosnoe, 2010; McLoyd, 1998; Paulson, Keefe, & Leiferman, 2009; Radke-Yarrow & Martinez, 1998). For example, Augustine and Crosnoe (2010) used longitudinal data to examine links between maternal depression and childhood academic achievement. They found that higher levels of maternal depression predicted poorer academic achievement (i.e., lower reading and math scores) for elementary school children whose mothers were less educated compared to those with more education. Relatedly, Paulson et al. (2009) used the Early Childhood Longitudinal Study, Birth Cohort (ECLS-B) to link maternal depression to language and reading-related skills. Specifically, mothers who experienced more depressive symptoms when their children were nine months old had children with lower expressive vocabulary skills at 24 months. Further, they found a significant indirect pathway from maternal depression to child vocabulary through home learning stimulation (i.e., parent–child reading). These findings provide some evidence that positive parenting practices can mediate the relation between maternal psychological functioning and child achievement. However, their study was limited because it only examined one aspect of maternal psychological functioning (i.e., depression) as well as one aspect of parenting (i.e., parent–child reading). We extend this work with an ecological lens by examining two indicators of maternal psychological functioning (depression and parenting stress) as well as multiple dimensions of parenting (warmth, home learning stimulation, and cultural socialization) and their subsequent relation to school readiness.

2.2. Maternal parenting stress

Maternal parenting stress is reflected in the level of strain, challenge or pressure that mothers report in their everyday interactions with their children (Loyd & Abidin, 1985). Mothers who report higher levels of parenting stress have less positive parent–child interactions as well as children with poorer language and cognitive skills (Gershoff, Raver, Aber, & Lennon, 2007; McLoyd, 1998; Nievar & Luster, 2006). Findings from a national study showed that increased maternal parenting stress was significantly related to deficits in parent-reported warmth, control, and home learning stimulation (Gershoff et al., 2007). Relatedly, studies have linked increases in maternal parenting stress to less cognitive stimulation during early childhood, which in turn contributes to deficits in later vocabulary skills (Nievar & Luster, 2006). Thus, an established perspective in the field is that relations between maternal parenting stress and child outcomes often occur as a result of declines in positive parenting practices. Although the link between maternal parenting stress, parenting, and academic outcomes is well established, little is known about these relations in African American families who are more likely to be exposed to demographic risks and parenting stress related to poverty or financial strain (McLoyd, 1998). It is likely that parenting stress may be exacerbated in low-income environments. For example, Ceballos and McLoyd (2002) found that African American mothers experience greater declines in positive parenting when demographic risk factors increase. As a result, more research is needed to understand complex relations between maternal parenting stress, parenting practices, and child outcomes in diverse samples of children.

3. Parenting

3.1. Maternal warmth and readiness

Maternal warmth plays a fundamental role in children's early learning and development (Landry, Smith, Swank, Assel, & Vellet,

2001). Findings from one study demonstrated that African American preschool children from low-income environments with mothers who were warm, responsive, involved, and supportive demonstrated improved school readiness skills as measured by concept recognition, vocabulary, and social responsiveness (Jackson, Brooks-Gunn, Huang, & Glassman, 2000). Similarly, Connell and Prinz (2002) used a sample of low-income African American families to link warm, responsive parent–child interactions to enhanced school readiness skills (i.e., vocabulary skills and social skills). In a sample of socioeconomically diverse African American children, Hill (2001) found that maternal warmth was related to pre-reading and pre-math skills. These studies and others like them (e.g., McWayne et al., 2004; Mendez, Fantuzzo, & Cicchetti, 2002) with samples of African American children provide promising evidence that warm, responsive parenting can enhance school readiness skills for African American children from diverse socioeconomic backgrounds.

3.2. Maternal home learning stimulation and readiness

Extant research suggests that several aspects of home learning stimulation (e.g., shared book reading) prior to kindergarten can have cognitive benefits for children (Britto & Brooks-Gunn, 2001; Hart & Risley, 1995; Parker, Boak, Griffin, Ripple, & Peay, 1999). Findings from one study demonstrated that maternal language use, home learning environment, and quality of maternal assistance were associated with early literacy skills in a sample of low-income African American children (Britto & Brooks-Gunn, 2001). In an exploratory study, Parker et al. (1999) found that improvements in parent–child relationships and home learning environments were associated with enhanced school readiness in a diverse sample of low-income children enrolled in Head Start. More recently, in large sample of African American families, Baker et al. (2012) found that two specific aspects of home learning stimulation, namely shared book reading and number of books in the home were related to school readiness among African American boys in kindergarten. Specifically, African American boys with mothers read to them more often and provided more children's books in their homes had better reading and approaches to learning scores in kindergarten.

3.3. Maternal cultural socialization and readiness

There is growing interest in the way that ethnic minority parents transmit messages about culture, race, and ethnicity to their young children. Research that has focused primarily on adolescents has shown that discussions about ethnicity and race are salient components of parenting in ethnic minority families (Garcia Coll et al., 1996; Hill et al., 2011). There is evidence that in addition to engaging in cognitive stimulation, African American mothers also transmit information about unique aspects of their culture including their racial, ethnic and religious heritage (Coard et al., 2007; Coard & Sellers, 2005; Hughes, 2003; Hughes et al., 2006; Stevenson, Winn, Walker-Barnes, & Coard, 2005). Consistent with prior research on this topic (Hughes, 2003; Hughes et al., 2006), we define cultural socialization as racial socialization practices that advance children's knowledge about their race, ethnicity, or heritage. A paucity of research has investigated African American mothers' efforts to engage in early cultural socialization (e.g., discussing racial/ethnic heritage) and its subsequent relation to school readiness. In one exception, O'Brien-Caughy et al. (2002) found that home-based cultural socialization practices were related to greater factual knowledge and better problem solving skills among African American preschoolers. In addition, African American mothers who socialized their pre-school children to be proud of their heritage also reported fewer problem behaviors. This research suggests that cultural socialization practices prior to school entry may contribute

to the development of early cognitive skills. To date, few studies have examined cultural socialization practices in relation to school outcomes for African American children during the developmentally important early childhood years. Our study aims to extend previous research and clarify the relation between early cultural socialization and school readiness.

3.4. Demographic risks and readiness

Maternal psychological functioning and proximal processes of parenting are influenced by demographic factors, which can influence children's readiness for school (Bronfenbrenner, 1986). Studies have shown that poverty and low maternal education tend to exert a negative influence on maternal psychological functioning and parenting practices (McLoyd, 1998). On average, mothers with more years of formal education and higher incomes tend to report fewer depressive symptoms and parenting stressors compared to less-educated and lower-income mothers (Hill, 2001; Sirin, 2005). Similarly, high SES is shown to be a positive predictor of quality of home environment, more sensitive parenting, and children's achievement. Further, children reared in safe communities with ample financial resources, highly educated, older mothers are more likely to experience academic success (Brooks-Gunn, Duncan, Klebanov, & Sealander, 1993; Duncan & Brooks-Gunn, 2000). However, mixed findings exist about the relationship between number of children in the home and parent functioning. Some studies indicate that more children in the home is associated with more maternal parenting stress due to multiple demands (Crnic & Greenberg, 1990; Heer, 1985) while other studies have found that more siblings in the home minimizes the demands of parents due to the assistance and support provided by siblings, especially older siblings (Behrman & Taubman, 1986).

Taken together, research suggests that demographic factors tend to influence the early development of young children. Consequently, our study controlled for six demographic variables that have previously been linked to less advantageous outcomes for children including: whether families were above or below the poverty line, single parent status/family structure, maternal education level, maternal age, neighborhood safety, and number of siblings.

4. Current study

Historic and present-day inequality and discrimination have resulted in larger numbers of African American families living below the poverty line than white families (Acs, 2011). The extensive achievement gap literature has shown that African American children living in poverty, single parent homes, and unsafe neighborhoods are more likely to enter kindergarten behind their more affluent peers in reading and math performance (Brooks-Gunn & Duncan, 1997; Duncan, Yeung, Brooks-Gunn, & Smith, 1998; Haskins & Rouse, 2005). Even so, there is promising evidence that positive parenting practices can enhance school readiness skills above and beyond the contribution of demographic risks (Baker et al., 2012). The present study builds on previous research with African American families through an investigation of multiple factors that may contribute to children's school readiness. Our focus on African American families represents an important extension of the developmental literature because previous research with African American families has often overlooked the role of culture in shaping specific parenting strategies, and research that has investigated school readiness among African American children has too often adopted a deficit approach and characterized all African American children as low income or impoverished. Therefore, there is a need for more comprehensive studies that acknowledge

two important factors: (1) African American families hail from high, middle, and low socioeconomic backgrounds, (2) African American parents often engage in culturally specific practices (e.g., cultural socialization) that may contribute to child development. Thus, culturally responsive research with an eye toward improving developmental competencies among African American children should involve investigations of culturally embedded practices and include socioeconomically diverse families.

Three specific research questions were examined: (1) what is the relation between maternal psychological functioning (i.e., depression and parenting stress) and parenting practices (i.e., warmth, home learning stimulation, and cultural socialization) among African American mothers with kindergarten children? (2) What is the relation between maternal psychological functioning and school readiness (i.e., reading and math scores)? (3) Is the relation between maternal psychological functioning and children's school readiness mediated by parenting practices? Three primary hypotheses were tested: (1) diminished maternal psychological functioning (i.e., increased depression and parenting stress) would be negatively related to positive parenting practices (i.e., decreased warmth, home learning stimulation, and cultural socialization); (2) optimal maternal psychological functioning (i.e., decreased depression and parenting stress) would predict better school readiness outcomes, defined in this study as higher reading and math scores; and (3) positive parenting practices would mediate the relation between diminished maternal psychological functioning and kindergarten reading and math scores.

5. Method

5.1. Participants

Data for the current study were collected from children, families, and teachers who participated in the Early Childhood Longitudinal Study (ECLS-K) Kindergarten Class of 1998–1999, sponsored by the National Center of Education Statistics. ECLS-K focused on young children's cognitive and non-cognitive growth and collected information from students, parents, teachers, and administrators. Using a multistage probability sampling design, the ECLS-K included a nationally representative sample of about 21,000 kindergarteners in over 1000 schools (National Center for Education Statistics, 2001). In the present study we used data from the first two waves of data collection (fall 1998 and spring 1999). Specifically, parenting practices and psychological functioning were measured at kindergarten entry and child achievement (reading and math) were measured at the end of the kindergarten year. Data for each child came from direct child assessments as well as parent interviews. The ECLS-K collected data from the child's caregiver through both a computer-assisted questionnaire and a self-administered questionnaire. In more than 90% of cases, the child's primary caregiver was the child's mother or female guardian (Rock & Pollack, 2002).

5.1.1. Sample and missing data

The purpose of this study was to investigate school readiness exclusively among African American children from diverse socioeconomic backgrounds. Therefore, only children of African descent (race identified by mothers) were extracted from the entire sample. In the fall of 1998, the majority of African American children in the sample lived in single-parent homes (56%), lived in homes above the poverty threshold (59%), and had on average 1–2 siblings (mean = 1.57, standard deviation = 1.33). On average, children's mothers had at least a high school education or GED with almost 30% having some college and the average age of mothers at the time of data collection was 31.93 (standard deviation = 8.17). The majority of the children were male (51%) and their average

age in the fall of 1998 was 74.10 months (standard deviation = 4.11 months).

The sample size for the analyses in the present study was ($N=2461$) African American children and their biological mothers. Using guidelines from Singer and Willett (2003), we used a three-step approach to selecting our analytic sample and dealing with missing data. First, only child and mother data collected during the fall and spring of kindergarten were used in the analyses (fall 1998 and spring 1999). In addition, data were limited to children who were first-time kindergarteners. Second, missing data analyses were conducted in SPSS 19.0 to identify patterns of missing data in our sample. Finally, to maximize the sample and avoid biased estimates due to listwise deletion, we used Full Information Maximum Likelihood (FIML) with empirical Bayesian estimation, which returns estimates that maximize the likelihood of producing the observed sample.

5.2. Procedure

5.2.1. School readiness

Reading and math scores were measured using individually administered untimed adaptive tests. The proficiency domains were adapted from the National Assessment of Educational Progress (NAEP) framework. All kindergarten children responded to a common set of questions, based on their performance on the common questions, children were routed to questions in three levels of difficulty (low, medium, and high). The reading test battery assessed knowledge of letters, word recognition, beginning and ending sounds, vocabulary, and passage comprehension. The reading test covered five proficiency levels: (1) identifying uppercase and lower case letters by name, (2) associating letters with sounds at the beginning of words, (3) associating letters with sounds at the end of words, (4) recognizing common words by sight, and (5) reading words in context, language and literacy skills, letter recognition, vocabulary, and comprehension. The reliability estimates for the reading test scores in kindergarten were .95.

The math test battery measured children's understanding of numbers, geometry, and spatial relations. The math assessment covered five levels of proficiency: (1) identifying one-digit numerals, counting up to 10 objects, and recognizing geometric shapes; (2) reading all one-digit numerals, counting beyond 10, recognizing a sequence of patterns, and using nonstandard units of length to compare objects; (3) reading two-digit numerals, recognizing the next number in a sequence, identifying ordinal positions of objects, and solving a simple word problem; (4) solving simple addition and subtraction problems; and (5) solving simple multiplication and division and recognizing more complex patterns. The reliability estimate for the math test score in kindergarten was .94.

Reading and math item response theory (IRT) scale scores from the fall and spring of kindergarten were used in this study. The scale scores are criterion-reference measures of achievement based on students' performance within a common and continuous scale (92-point scale for reading and 64-point scale for math). IRT procedures estimate patterns of responses for questions based on patterns of right, wrong, and omitted responses and on item parameters of difficulty, discriminating ability, and "guess ability" (Rock & Pollack, 2002).

5.2.2. Maternal psychological functioning

Two aspects of mother-reported psychological functioning (depression and parenting stress) were examined. To measure maternal depression, the ECLS-K used an abbreviated version of the original 20-item Center for Epidemiological Studies of Depression Scale (Radloff & Locke, 1986) developed by the National Institute of Mental Health. Thus, in our study, depression was measured using a 12-item scale in which mothers reported how often (1 = never

to 4 = most of the time, $\alpha = .87$) during the past week they experienced specific depressive symptoms. An example of a maternal depression item is, "How often during the past week have you felt depressed?" To measure maternal parenting stress, the ECLS-K used seven items from the Parent Parenting stress Index (Loyd & Abidin, 1985), which measured how true (1 = completely true to 4 = not at all true, $\alpha = .72$) mothers felt about particular statements. An example of a maternal parenting stress item is, "Being a parent is harder than I expected?"

5.2.3. Parenting practices

All parenting behaviors were measured with items from the Home Observation for Measurement of the Environment scale (Caldwell & Bradley, 1984). For this study, we focused on three aspects of home-based parenting (warmth, home learning stimulation, and cultural socialization). Maternal warmth was measured using an average of a 5-point scale where mothers rated six statements (1 = completely true to 4 = not at all true, $\alpha = .58$). An example of a specific warmth item is "I express affection by hugging, kissing, and holding my child?" Maternal home learning stimulation was the average of 10 items that measured the frequency (1 = never to 4 everyday, $\alpha = .73$) of maternal participation in home-based educational activities. An example of a home learning stimulation item is "How often do you read to your child?" Maternal cultural socialization was measured using the mean of a 3-item scale that asked mothers to report how often (1 = not at all, 5 = everyday, $\alpha = .65$) they engaged in cultural socialization practices. The specific items include: (1) How often do you engage in conversations about your ethnic/racial heritage with your child, (2) How often do you engage in conversations about your religion with your child? and (3) How often do you and your family participate in cultural events? The selection of parenting items in this study was consistent with previous research on maternal warmth (Downer & Pianta, 2006), home learning stimulation (Christian et al., 1998; McWayne et al., 2004), and cultural socialization (Hughes, 2003; Hughes et al., 2006; O'Brien-Caughy et al., 2002).

5.2.4. Demographic characteristics

We included six demographic characteristics in our models as controls. *Poverty level* was a binary variable with a value of (0 = at or above poverty level or 1 = below poverty level). *Family structure* was a binary variable with a value of (0 = not a single parent and 1 = single parent). *Mothers' highest level of education* was an ordinal variable with values ranging from 1 = 8th grade or below to 9 = doctorate degree. *Neighborhood safety* (i.e., How safe to play outside) was an ordinal variable with values ranging from (1 = not at all safe to 3 = very safe). *Mother's age at first birth* and *number of siblings* in the home were continuous variables. Three additional variables were included as controls in our study. Specifically we controlled for *age at kindergarten entry* (continuous variable), *gender* (dummy variable, 1 = male and 2 = female), and *fall reading and math scores* (continuous variables). All variables except for dummy variables were treated as continuous in our models.

5.3. Analytic strategy

The ECLS-K data set is based on a complex sampling design thus; we used the appropriate weight (i.e., BYPW0) in the following analyses based on information from the *Base Year User's Manual* to ensure results were representative. Using SAS 9.2, we computed means and standard errors for all study variables (see Table 1). To examine whether maternal depressive symptomatology and parenting stress were related to African American children's kindergarten reading and math achievement through parenting practices (i.e., warmth, home learning stimulation, and

Table 1
Bivariate correlations, means, and standard deviations for study variables.

	Depressive symptomatology	Parenting stress	Home learning stimulation	Warmth	Cultural socialization	Reading achievement	Math achievement	Mean (SD)
Depressive symptomatology	1.00							1.59 (.54)
Parenting stress	.37	1.00						1.65 (.53)
Home learning stimulation	-.01	-.11	1.00					2.80 (.50)
Warmth	-.21	-.31	.23	1.00				3.23 (.31)
Cultural socialization	-.01	-.08	.25	.13	1.00			3.22 (.95)
Reading achievement	-.12	-.12	.04	.005	.12	1.00		42.58 (11.38)
Math achievement	-.10	-.11	.07	.002	.09	.71	1.00	31.29 (9.64)

Note. Bolded estimates are significant at $p < .05$.

cultural socialization), we conducted a theoretically driven path analysis (discussed further below).

6. Results

6.1. Preliminary analyses

Bivariate correlations between maternal psychological functioning, parenting, and children's achievement were examined (research questions 1 and 2). Pearson correlation analyses revealed that maternal depressive symptomatology was negatively related to maternal warmth. Maternal parenting stress was negatively related to maternal warmth, home learning stimulation, and cultural socialization. Maternal depressive symptomatology and parenting stress were negatively associated with African American children's reading and math achievement. In contrast, home learning stimulation was positively associated with African American children's math achievement, and cultural socialization was positively associated with children's reading. Maternal warmth was not significantly associated with children's achievement. Table 2 presents bivariate correlations among all of the variables in the study.

6.2. Path analysis

To address our final research question investigating whether maternal depressive symptomatology and parenting stress were related to African American children's kindergarten reading and math achievement through parenting practices (i.e., warmth, home learning stimulation, and cultural socialization), a path analysis was conducted with appropriate weight using MPlus[®] 5.0 (Muthén & Muthén, 2007). Evidence of mediation was determined by evaluating the significance of the indirect effect (Bollen, 1987) and using bias-corrected confidence intervals. This approach was chosen over the commonly used causal steps approach (Baron & Kenny, 1986) due to the low statistical power of the causal-step approach, which may result in the failure to detect real effects (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002). Further, the causal

steps approach does not allow for the test of multiple mediators and it does not provide a formal test of the significance of the intervening variable. Mplus[®] was used to conduct the mediation analyses which allowed for testing of multiple mediators and had the further advantage of the use of full-information maximum likelihood to deal with data assumed to be missing at random. Model fit was assessed by the obtained chi-square, Confirmatory Fit Index (CFI), Tucker Lewis Index (TLI), and root mean square error of approximation (RMSEA). Good fit is indicated by a non-significant p -value for the chi-square, value greater than .95 for CFI, values below .05 for RMSEA, and values below .08 for SRMR (Bentler & Bonett, 1980; Browne & Cudeck, 1992; Hu & Bentler, 1998).

To test the path analyses, maternal depressive symptomatology and parenting stress were modeled to predict warmth, home learning stimulation, cultural socialization, and children's reading and math achievement, adjusting for controls (poverty status, maternal education, family structure, mother's age at first birth, and neighborhood safety) (see Fig. 1). Warmth, home learning stimulation, and cultural socialization were also simultaneously modeled to predict children's reading and math achievement. All paths were simultaneously tested and allowed for the simultaneous testing of mediators in the model. In all the models, the covariance errors for the independent variables (depressive symptomatology and parenting stress), the mediators (warmth, home learning stimulation, and cultural socialization) and child outcomes (reading and math achievement) were controlled. All models included statistical controls for poverty status, maternal education, family structure, mother's age at first birth, and neighborhood safety. The fit indices for the final model is $\chi^2(10) = 24.834$, $p < .01$; CFI = .996; RMSEA = .025; SRMR = .012.

Table 2 shows the estimates for the direct effects linking maternal depressive symptomatology, parenting stress, and parenting practices to children's reading and math achievement. Specifically, maternal parenting stress was negatively related to children's reading and math achievement, maternal warmth was negatively associated with reading achievement, and home learning stimulation was positively associated with children's math achievement (see Table 2). Path analyses also indicated that maternal depressive

Table 2
Standardized and unstandardized direct pathway estimates for reading and math achievement.

	Reading achievement			Math achievement		
	B	B (SE)	C.I.	B	B (SE)	C.I.
Depressive symptomatology	.03	.59 (.44)	-.56–1.73	.01	.21 (.30)	-.56–.98
Parenting stress	-.05	-1.12 (.36)**	-2.04–.19	-.04	-.72 (.30)*	-1.50–.07
Home learning stimulation	.01	.19 (.35)	-.70–1.09	.04	.81 (.28)**	.09–1.53
Warmth	-.04	-1.48 (.52)**	-2.83–.13	-.02	-.64 (.50)	-1.92–.65
Cultural socialization	.01	.06 (.17)	-.37–.48	-.01	-.12 (.16)	-.53–.28

Note. $N = 2461$. Covariates included in the models are fall score, age, gender, number of siblings, mother's age at first birth, neighborhood safety, family structure, poverty, and maternal education. Weight used was BYPW0. Dash signs = through (i.e., $-1.92-.65 = -1.92$ through $.65$).

* $p < .05$.

** $p < .01$.

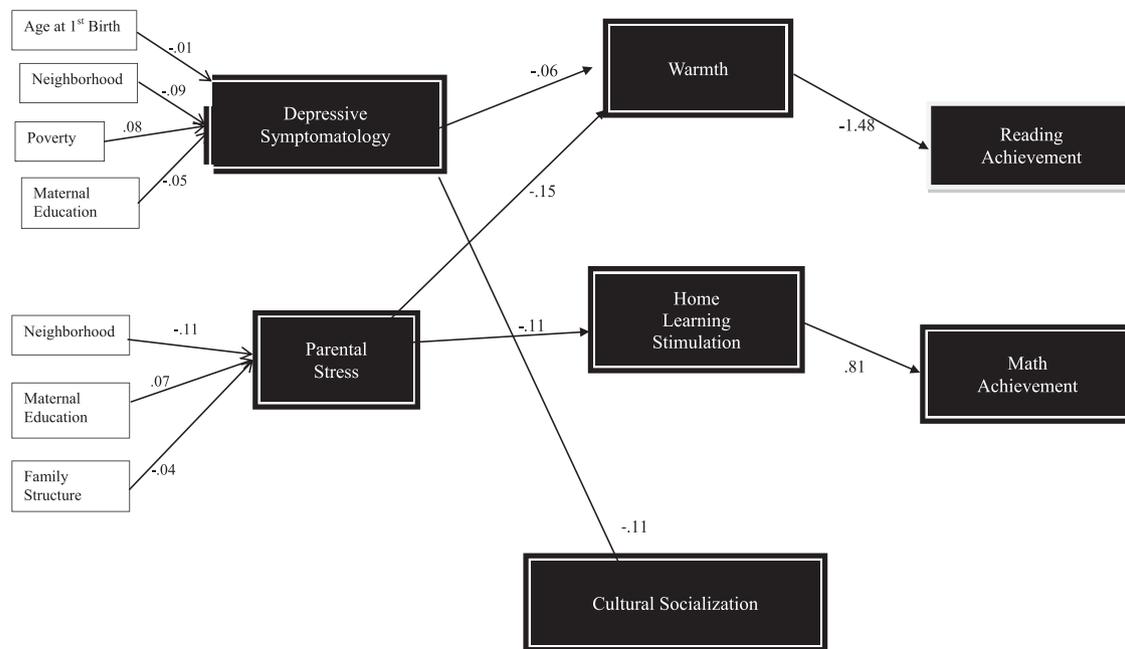


Fig. 2. Final path model depicting significant pathways (unstandardized estimates shown). Direct paths from depressive symptomatology and parent stress to children's reading and math achievement are not depicted.

symptomatology predicted maternal warmth and cultural socialization, and maternal stress predicted maternal warmth and home learning stimulation (see Fig. 2).

Of the 12 indirect pathways examined, three estimates were significant (see Table 3). Specifically, maternal depressive symptomatology and parenting stress were associated with children's reading achievement through warmth; and maternal parenting stress was related to children's math achievement through home learning stimulation (see Table 3). The model explained 57% and 62% of the variance in reading and math achievement, respectively.

7. Discussion

Decades of educational research has documented an achievement gap in kindergarten reading and math achievement between African American children and their European American counterparts. Research has also shown that specific parenting practices (e.g., home literacy involvement) have the potential to narrow these gaps by at least half (Brooks-Gunn & Markman, 2005). Therefore, this study examined the relations between maternal psychological functioning, parenting practices, and school readiness (defined in this study as kindergarten reading and math achievement) in a nationally representative sample of African American children and their mothers. Specifically, we investigated whether

and how maternal depression and parenting stress may influence specific parenting practices, as well as whether parenting practices (i.e., maternal warmth, home learning stimulation, and cultural socialization) may mediate the relation between maternal depression, parenting stress, and children's kindergarten reading and math achievement. Path analysis revealed a direct negative effect of maternal depression and parenting stress on maternal warmth, home learning stimulation, and cultural socialization. Home learning stimulation emerged as an important mediator between maternal parenting stress and math achievement. Further, maternal warmth mediated the relation between maternal depression and reading achievement. These findings are discussed further below.

7.1. Maternal psychological functioning and early parenting practices

Although some studies have highlighted the importance of early parenting to African American children's school readiness (Brooks-Gunn & Markman, 2005), the majority of these studies have narrowly focused on small samples of African American children living in low-income, urban communities (McWayne et al., 2004) or rural impoverished communities (Brody & Flor, 1997; Burchinal, Campbell, Bryant, Wasik, & Ramey, 1997) and these

Table 3
Standardized and unstandardized indirect pathway estimates for reading and math achievement.

	Reading achievement			Math achievement		
	B	B (SE)	C.I.	B	B (SE)	C.I.
Depressive symptomatology → warmth	.004	.09 (.04) [†]	-.010–.184	ns	ns	ns
Parenting stress → warmth	.010	.23 (.08) ^{**}	.012–.443	ns	ns	ns
Depressive symptomatology → home learning stimulation	ns	ns	ns	ns	ns	ns
Parenting stress → home learning stimulation	ns	ns	ns	-.005	-.09 (.04) [†]	-.191–.005
Depressive symptomatology → cultural socialization	ns	ns	ns	ns	ns	ns
Parenting stress → cultural socialization	ns	ns	ns	ns	ns	ns

Note. N = 2461. Covariates included in the models are fall score, age, gender, number of siblings, mother's age at first birth, neighborhood safety, family structure, poverty, and maternal education. Dash signs = through (i.e., $-1.92-.65 = -1.92-.65$).

[†] $p < .05$.

^{**} $p < .01$.

studies have rarely examined psychological antecedents to parenting behavior. The present study extended previous research by using a large, nationally representative sample of African American families to examine whether and how maternal depression and parenting stress may be related to specific parenting practices and school readiness. Data in this study supported our hypothesis that increased depression and parenting stress would be negatively related to positive parenting. These findings are also consistent with previous research that has included African American families. For example, Gershoff et al. (2007) found that greater maternal depression and parenting stress were related to less warmth and home learning stimulation. However, the newer finding that increased depression and parenting stress was also related to fewer cultural socialization practices has not been documented in previous research studies. Several explanations for these findings are evident. First, mothers who report more parenting stress may be faced with negotiating multiple overwhelming responsibilities. Multiple responsibilities often lead to greater parenting stress because they require mothers to divide their attention between several tasks that leave less time for less optimal child rearing. Thus, it is not surprising that mothers who are more stressed tend to engage in less frequent positive practices with their children. It is also plausible that mothers who experience more depressive symptoms (e.g., sadness, irritability or loneliness) are less likely to be in the mood to engage in warm, cognitively stimulating or culturally embedded interactions with their children. Depression often leads to isolation and mothers who are more depressed want to be alone rather than engaging, thus impeding their ability to be warm and cognitively engaging with their children.

Because cultural socialization is often an extension of “normally” occurring parenting practices it is not surprising that mothers who experienced more depressive symptoms and more stressors also engaged in less frequent cultural socialization. Research suggests that cultural socialization practices often occur during parent–child discussions (Wang & Huguley, 2012). Thus, it is plausible that as mothers who are more depressed and stressed are less likely to feel like engaging in conversations about their cultural heritage. These findings point to the need to more comprehensively examine cultural socialization practices in African American families. For example, are there other unmeasured culturally embedded practices that decline as a result of diminished psychological functioning in African American families? More qualitative and mixed methods research is needed to examine such questions and their subsequent relation to children’s development. For example, Wang and Huguley (2012) examined the relation between parenting, cultural socialization, and academic achievement in a sample of African American adolescents. They found that African American teens who had parents who engaged in more cultural socialization (i.e., discussions about racial heritage and pride) had better academic achievement scores than children with parents who did not engage in these practices. However, their study did not examine whether declines in maternal psychological health may decrease the likelihood that parents will engage in cultural socialization. The present study provided some evidence that declines maternal psychological health negatively influences “traditionally” measured parenting practices (i.e., warmth and home learning stimulation) and culturally embedded parenting practices (i.e., cultural socialization) in African American families.

7.2. *Maternal psychological functioning and school readiness*

Although some studies have highlighted the importance of early parenting to African American children’s school readiness (Brooks-Gunn & Markman, 2005), the majority of these studies have narrowly focused on small samples of African American children living in low-income, urban communities (McWayne et al.,

2004) or rural impoverished communities (Brody & Flor, 1997; Burchinal et al., 1997) and these studies have rarely examined psychological antecedents to parenting behavior. The present study extended previous research by using a large, to examine whether and how maternal depression and parenting stress may be related to specific parenting practices and school readiness. Data in this study supported our hypothesis that increased depression and parenting stress would be negatively related to positive parenting.

Central to the positive development of all children is the emotional stability of caregivers who can provide appropriate amounts of love, support, and stimulation (Cummings, Davies, & Campbell, 2000; Davies & Cummings, 1998). Findings from the present study suggest that maternal psychological functioning is an important determinant of parenting behavior in African American families, which has a lasting influence on child development. Given the long-standing interest in ameliorating the reading and math achievement gap for African American children at kindergarten entry (Haskins & Rouse, 2005), it is especially important to consider the finding of a positive relation between healthier maternal psychological functioning and kindergarten reading and math achievement. It is plausible that mothers in this study who experienced more depression and parenting stress when their children were young were less likely to participate in appropriate scaffolding behaviors that promote reading and math competence. Because early childhood is a time when children are rapidly acquiring new knowledge and skills, it is especially important that mothers have time to engage in behaviors that promote children’s academic development. Although more research is needed, it appears that one way to decrease the achievement gap between black and white students may be by investing in strategies that promote healthy psychological functioning among African American mothers with young children. School and community supports that provide resources for combating depression and parenting stress may prove especially useful for African American mothers.

Notably, parenting stress was more strongly related to reading and math achievement than depression suggesting that maternal parenting stress exerts a unique influence on child development. The lack of relation to depression may be due to cultural differences in the way that African American mothers cope with depression. For example, there is some evidence that ethnic minorities cope with depression differently than whites (Bromberger, Harlow, Avis, Kravitz, & Cordal, 2004; Plant & Sachs-Ericsson, 2004). More research is needed that examines the differential relations between maternal depressive symptomatology and parenting practices within a cultural–ecological framework in order to fully understand these associations among different racial, ethnic, and socioeconomic groups.

7.3. *Evidence of mediation: maternal psychological functioning, parenting and school readiness*

Data from this study showed that maternal warmth, such as showing affection, is one pathway through which maternal psychological function is related to children’s reading achievement. Specifically, maternal warmth mediated the relation between maternal depression and kindergarten reading achievement. These findings are in line with the work of Burchinal et al. (1997), who demonstrated that higher levels of maternal warmth and home learning stimulation mediated the relation between family risk variables and reading and math performance in a small sample of low-income African American children during the transition to school. Interestingly, in this study, warmth mediated the relation for reading, but not math. These results suggest that warm relationships with children may increase the ease by which mothers are able to function as educators and promoters of literacy for children in their homes. For example, mothers who express more affection

and sensitivity toward their young children may experience greater success in transmitting reading related skills than mothers who are less warm. In this study, maternal warmth included items such as the frequency of having warm, close interactions with their child, and frequency of expressing love toward their child. Environments rich in these types of interactions are distinctly different from home environments where mothers report feeling unresponsive or too busy to respond to the needs of their young children. Our findings corroborate a well-established contention in the developmental literature that warm, responsive mothers positively contribute to children's development.

Similar to Burchinal et al. (1997) our study found that home learning stimulation mediated the relation between maternal parenting stress and children's kindergarten math skills. Home learning stimulation included literacy related items (e.g., frequency of parent-child reading, frequency of library visits), items related to physical activity (e.g., frequency of playing sports with children) and items related to creativity (e.g., frequency of doing art and singing songs). The diverse nature of the home learning stimulation items suggests that mothers have the potential to engage in a plethora of cognitively stimulating activities in and outside their homes. A number of these activities include a math component and require children to utilize skills are required to solve math problems. A number of these items may have been overlooked in previous literature because most literacy research has focused exclusively on parent-child reading behaviors. To our knowledge, few studies have investigated other learning-related home activities (e.g., playing sports, board games, and building structures) in relation to early math achievement. These activities require children to utilize skills such as keeping score, counting, and categorizing in the context of social interactions with their families. Thus, it is possible that these activities contribute to numeracy related skills, which can enhance math competence.

More research is warranted to examine which aspects of these learning activities can be fine-tuned to further support children's academic achievement. Related to this, further research is needed to examine whether warmth and home learning stimulation have lasting effects of children's cognitive development beyond the transition to kindergarten. For example, research could investigate whether warm parent-child interactions are predictive of middle school or high school reading and math achievement. In addition, because parenting items from the ECLS-K utilized broad parent report statements to measure the frequency of warmth and home learning stimulation (e.g., how often do you express love to your child? and how often do you read to your child?), mixed-methods research is needed to examine the quality of these interactions during early childhood. For example, qualitative observations of parenting practices collected during home visits will help researchers determine whether children benefit from the quality versus quantity of parent-child interactions. Results from these studies will help to support mothers in creating environments where learning is warmly supported, nurtured, and encouraged.

Finally, although one empirical study documented the benefits of cultural socialization to preschool academic achievement (O'Brien-Caughy et al., 2002), findings from the present study did not corroborate these findings. This finding may be due to limitations of the ECLS-K data, which only provided three, very broad cultural socialization items. A more comprehensive measure of cultural socialization may have yielded findings similar to previous research. It is also plausible that cultural socialization may be more related to children's social, emotional or behavioral competence because of the focus on strengthening racial pride in an effort to combat negative stereotypes about one's race. A child that is proud of their heritage may experience fewer social or behavioral challenges due to enhanced self-confidence. More research is needed to understand specific processes related to culture that influence early

academic achievement in African American families. For example, future work might employ a measure of ethnic identity appropriate for use with early childhood and preschool age populations to determine whether cultural socialization can be linked to healthy ethnic identity formation and school performance.

7.4. Limitations and future directions

Overall, this study provides valuable information about the relation between maternal psychological functioning, parenting practices and school readiness, but some limitations require mention. First, this study used parent-report surveys to measure key independent variables (i.e., depression, parenting stress and parenting practices). Information provided by mothers does not provide a comprehensive picture of maternal psychological functioning or parenting practices that may be associated with the development of academic competence among children in kindergarten. Further, this study did not include clinical measures of depression and parenting stress from independent psychological evaluations or observations. As such, we were unable to provide more detailed depictions of depression and parenting stress and their subsequent relation to early parenting and school readiness. Future research could utilize more diverse measures (e.g., clinical observations) of maternal psychological health in relation to children's school readiness. Relatedly, the questions tapping cultural socialization were selected by the developers of the ECLS-K and were limited to three items. Our correlational findings linking fewer depressive symptoms to more frequent culturally socialization practices points to a need to take an inductive approach to measuring cultural socialization in order to more comprehensively capture its relation to school readiness. Because race is a salient social category in the United States and most of the research on cultural socialization has focused on African American adolescents (McHale et al., 2006) future research with African American children should use a measure of cultural socialization that has been validated in diverse samples of children and their families.

It is also important to note that the present study does not include qualitative observations of parenting practices. Observational data may provide a different and unique picture of parenting and parent-child interactions not apparent in quantitative data. That is, the current study was only able to consider information obtained from parent assessments of the frequency of their parenting behaviors with their children and it is possible that these measures suffer from social desirability.

7.5. Implications for early childhood research, practice, and policy

National goals demand that all children enter kindergarten ready to learn. Yet, early childhood research suggest that a number of African American children, particularly those from low-income environments enter kindergarten behind in reading and math and much of this variation can be explained by early parenting (Brooks-Gunn & Markman, 2005). This study indicates that maternal psychological functioning and parenting practices are related to African American children's school readiness; therefore, there is a need to provide more support to mothers to combat the parenting stress of parenting. Thus, early childhood researchers, educators, and policy makers should endeavor to create family policies that acknowledge the importance of healthy psychological functioning for all mothers. In addition, parenting, particularly warmth and home learning stimulation, was directly related to children's academic achievement and there was a direct link between maternal psychological functioning and children's academic outcomes. This would indicate that more targeted support could be given to mothers who experience more depressive symptoms and more

parenting stressors in an effort to increase their capacity to provide warm, cognitively stimulating experiences for their children.

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