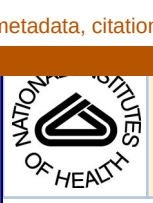

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The Differential Impact of Early Father and Mother Involvement on Later Student Achievement

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Abstract

The purpose of this exploratory study was to examine the direct and indirect effects of early parenting on later parental school involvement and student achievement. The sample, pulled from the first and second waves of the Panel Study of Income Dynamics – Child Development Supplement data set, consisted of 390 children ages 2–5 at time 1 and their families. Fathers' and mothers' participation in five dimensions of early parenting behaviors were assessed at time 1, while later parental school involvement and student achievement were assessed at time 2. Although early paternal and maternal parenting behaviors were not directly related to later student achievement, differences were revealed in the pattern of relationships between early parenting and later parental school involvement for fathers and mothers. In addition, fathers' later school involvement was found to be negatively related to student achievement while maternal school involvement was found to be positively related to student achievement. These findings provide partial support for the hypothesized differential relationship between fathers' and mothers' early parenting and later student achievement.

The Differential Impact of Early Father and Mother Involvement on Later Student Achievement

The influence parents have on their children's academic success has been acknowledged by researchers, policymakers, and educators alike. A significant body of research indicates that when parents participate in their children's education the result is an improvement in student achievement (Barnard, 2004; Dearing, Kreider, Simpkins & Weiss, 2006; Walker et al., 2004). Parental involvement has been observed to be positively associated with student

behaviors and attitudes in such areas as increased school attendance, fewer discipline problems, and higher scholastic aspirations (Epstein & Sanders, 2002; Henderson & Berla, 1994; Hill, Castellino, Lansford, Nowlin, Dodge, Bates, & Pettit, 2004;). Importantly, the benefits of parental involvement have been found across a variety of family contexts. For example, studies have found that involvement of nonresident parents is academically beneficial (Amato & Gilbreth 1999; Nord & West, 2001) and that parental involvement across racial and ethnic groups is a significant contributor to school performance (Englund, Lackner, Whaley & Egeland, 2004; McBride, Dyer, & Lu, 2006; Roopnarine, Krishnakumar, Metindogan, Evans, 2006).

When examining its influence on child achievement, parents' involvement in their children's education has been conceptualized in a variety of ways. The parental involvement literature has focused primarily on parents' activities that are specifically related to children's school programs. These school-specific types of involvement are often separated into school-and home-based involvement. School-based involvement is typically defined as communications with school staff and activities parents do *at* the school. For example, studies often examine how often parents observe or volunteer in the classroom, attend school programs, and have contact with the child's teacher (e.g., Brody & Flour, 1998; Crosnoe, 2001; Hill, 2001; Manzicopoulos, 2003; Marcon 1999; Miedel & Reynolds, 1999). In contrast, home-based involvement includes those activities parents do at home that directly relate to the child's school activities. Measures of home-based involvement include communication with the child about school, helping with homework, and parents' awareness of school projects (e.g., Dinh, Roosa, Tein, & Lopaz, 2002; Hill, 2001; Manzicopoulos, 2003; Seginer, 2006; Shumow, Vandell, & Kang, 1996).

In addition to the above definitions, researchers have identified forms of parental involvement that are hypothesized to play a role in children's achievement although they do not directly relate to school functions. For example, Nord, Brimhall, and West (1997) suggest that parents can influence school achievement by engaging with their children in activities that promote cognitive skills such as playing games and sports, working on projects, visiting the library and museums, attending community events, and talking about family history and current events. These types of parenting behaviors have the potential to foster basic skills which enhance children's abilities in school settings (Scott-Jones, 1995). In addition, much attention has been given to broader forms of parental involvement and literacy learning. Several studies have noted that children's exposure to books and parents' reading to and interacting verbally with children positively relates to children's verbal skills (Christian, Morrison, & Bryant, 1998; Earing, McCartney, Weiss, Kreider & Simpkins, 2004; Hess, Holloway, Dickson, & Price, 1984; Marjoribanks, 1988; Sénéchal & LeFevre, 2002). Finally, these types of parental involvement have been considered influential in children's achievement through their impact on the child's control understanding (i.e., children's understanding of who or what controls outcomes in their lives), as well as their sense of competence, perceived autonomy, mental health, and self-esteem (Grolnick, Ryan, Deci, 1991; Flouri, 2005).

In this vein researchers have examined how general parenting behaviors early in a child's life may influence later school performance. While little research has been done in this area,

the few studies that have been conducted are providing support for this possibility. For example, Magill-Evans and Harrison (2001) found that parental interactions and other social factors at 12 months were stronger predictors of expressive language development at age four than were child biological factors. Similarly, a father's involvement with his infant has been found to be predictive of cognitive skills at age three (Roggman, Boyce, Cook, Christiansen, & Jones, 2004; Yogman, Kindlon, & Earls, 1995).

As research on fathers' early parenting behaviors has expanded rapidly in recent years, one important issue has come to light: how should father involvement during the early childhood period be conceptualized and measured (Schoppe, McBride & Ho, 2004)? Although much of the early research on fathering focused on temporal dimensions of parenting (Pleck & Masciadrelli, 2004), a growing body of research suggests that early paternal involvement consists of several different behaviors/activities, and that each behavior potentially has a unique set of antecedents and consequences (Day & Lamb, 2004; Hawkins et al., 2002; Schoppe, McBride & Ho, 2004). This expanded view of men's early parenting would include assessments of time spent in activities such as playing with the child or reading to them (temporal dimensions of parenting), as well as less time-based forms of early parenting such as expressions of affection towards the child (Schoppe, McBride & Ho, 2004). In the current study, paternal and maternal reports are used to assess participation in temporal and other forms of early parenting behaviors.

While school specific parental involvement and early parenting are important to child academic achievement, the relationship between the two constructs remains unexplored. However, Epstein's model of parent-school partnerships may provide a useful framework for describing the relationship between these two forms of involvement (Epstein, 1987; Epstein & Sanders, 2002). This model conceptualizes family and school environments as separate spheres that can overlap, with the degree of overlap representing the interpersonal relationships that occur between family and educators. This overlap has been conceptualized by scholars as school specific parent involvement mentioned above. Relationships between family and schools have the potential to generate "social capital" (Coleman, 1988) which can be used by families and educators as a resource to improve children's opportunities for academic success. For example, an important resource for both educators and parents is information. As parents and educators share information about the child, they are better able to modify their respective environments to accommodate the child's development.

The degree of overlap between the family and school spheres is dependent on the forces which either push them together or pull them apart (Epstein, 1987). These forces include both the schools' and the families' philosophy and prior experiences (e.g., families that feel education is the sole responsibility of the school are less likely to engage in discussions with teachers about how the family can better support the child's school program). In addition to these family and school characteristics, there is also a temporal dimension that exerts force on the degree of family-school overlap. The child's developmental stage and grade in school all play a part in the degree of overlap. Indeed, it has been consistently observed that as the child grows older, parents tend to be less involved in the child's schooling (Crosnoe, 2001; Epstein, 1986).

Epstein's (Epstein & Sanders, 2002) model of overlapping spheres and home-school partnerships provides an excellent framework for conceptualizing the relationship between school-specific involvement and early parenting. Drawing from this model, it is hypothesized that not only do early parenting behaviors indicate parents' willingness to engage in other child activities (i.e., indicative of family philosophy), but such involvement also creates parent-child relationship processes that may motivate parents to engage in the child's schooling. For example, the amount of time parents spend with their child influences the parent-child affective relationship. This relationship subsequently has influence on parents' motivation to act on the child's behalf in their school program.

However, caution must be used when interpreting the research literature exploring the relationship between early parenting, later parental involvement in school and student achievement. As mentioned earlier, there is a growing body of research suggesting parent involvement in their children's education can lead to increased student achievement (see Figure 1a). Likewise, there is empirical evidence (although somewhat limited) suggesting that early parenting behaviors can lead to increased student achievement (see Figure 1b). In contrast, there has been little empirical work that has sought to link these two forms of involvement to explore how they might work together in influencing student achievement (see Figure 1c). The current study is an initial attempt to fill this gap in the research literature.

A second caution must be used when interpreting the research literature exploring the relationship between early parenting, later parental involvement in school and student achievement. Although this research literature has been expanding rapidly in recently years, the operational definition of parenting and parental involvement in school used in this work has been overwhelmingly limited to *mother involvement*. Most studies fail to examine how mothers and fathers differentially contribute to their child's education through early parenting and later school involvement (Barnard 2004; Hill, Castellino, Lansford, et. all, 2004; Keith, Keith, Quirk, et. al 1998; Manz, Fantuzzo, & Power, 2004; McWayne, Hampton, et. al., 2004). For example, in a review of over 1,000 recent articles in the four leading U.S. school psychology journals fathers were "included substantially in nine articles and were the primary focus of only one…article" (Grief & Grief, 2004). Often, this lack of examining a father's contribution stems from the assumption that a father's role in school is nonexistent or subordinate to that of the mother.

Although there has been limited research focusing on school specific father involvement, recently released data indicates that this type of paternal involvement may have a positive influence on child outcomes over and above that of mothers' school specific involvement. Data from the National Household Education Survey (NHES) of 1996 suggest "in two-parent households, fathers' involvement in their children's schools has a distinct and independent influence on children's achievement over and above that of mothers" (Nord, 1998 p. 2). These findings from the NHES are the most widely cited evidence of the positive impact of father involvement in children's schooling. Similarly, Fagan and Iglesias (1999) found that children whose fathers were involved with their Head Start program showed higher mathematics readiness change scores, while Flouri and Buchanan (2004) found that father involvement at age 7 had significant positive effects on educational attainment

throughout adolescence and up through age 20. Additionally, McBride and his colleagues (McBride, Schoppe-Sullivan & Ho, 2005) provide evidence that father participation in some aspects of school involvement may be related to student achievement. Despite these documented contributions made by fathers when they become involved in their children's schooling, there are several shortcomings in this limited literature base that prevent us from making definitive conclusions about the impact of father-school partnerships on children's achievement. These limitations include narrow definitions of school involvement and home-school partnerships, a reliance on mothers' reports of fathers' school involvement, a lack of longitudinal studies examining the impact of father-school partnerships, and limited measures of child outcomes used in these studies. A major focus of the current study is on identifying the unique roles played by fathers in influencing their children's school achievement.

The current study attempts to overcome these shortcomings in the research literature that links early parenting, later parental involvement in school and student achievement. The goal of the present study is to investigate the relationship among these three constructs, examining direct and indirect effects of early parenting on child achievement. It is hypothesized that early parenting will be directly associated with later child academic achievement as well as indirectly through later school involvement. It is also hypothesized that the nature of these relationships with student achievement will vary across mothers and fathers. In testing the hypotheses, this study utilizes a multidimensional conceptualization of early parenting. Such an approach conceptualizes early parenting as consisting of several dimensions, each with its own set of antecedents and consequences (e.g., Schoppe, McBride & Ho, 2004). Consideration of various domains of early parenting is critical as they are likely differentially associated with later school-specific involvement and student achievement. Thus, embedded in investigating the question of the relationship between early parenting and academic achievement is the question of how this relationship differs across parenting domains.

Method

Background

Data for this study were obtained from the first and second waves of the Child Development Supplement (CDS) of the Panel Study of Income Dynamics (PSID). With core funding from the National Science Foundation, the PSID is an ongoing longitudinal survey of a representative sample of U.S. men, women, children, and the families in which they reside, and includes data on employment, income, wealth, housing, food expenditures, transfer income, and marital and fertility behavior. This data has been collected annually by the Survey Research Center at the University of Michigan for more than 35 years (PSID-CDS, 2004).

The CDS is a supplement to the core PSID data that was begun in 1997 with funding from the National Institute of Child Health and Human Development. The goal of the CDS is to provide researchers with a nationally representative database of children and their families, including information about child development, parenting, and schooling (Fuligini & Brooks-Gunn, 2004). For the first wave of the CDS (time 1), data from approximately 2,500

PSID families were collected regarding nearly 3,600 children aged 0–12 years (including up to two randomly selected children per family). The time 1 survey of the CDS was conducted during the spring and fall of 1997 (Hofferth & Anderson, 2001). Ninety percent of the families in the core PSID sample contacted about the CDS at time 1 agreed to participate. Eighty-four percent of families who were contacted for the first time in 1997 as part of an immigrant "refresher" sample of families that entered the U.S. post-1968 agreed to participate. The combined response rate for the CDS time 1 sample was 88% (Hofferth & Anderson, 2004). Included in time 1 data of the CDS is information on approximately 1400 fathers who lived in the child's home and 280 who do not reside in the home (i.e., absent/non-residential fathers).

During fall, 2002 and spring 2003 a total of 2,226 families who had participated in time 1 data collection for the CDS and who had remained active in the PSID panel as of the 2001 PSID interviews were re-contacted about participating in the second wave of data collection for the CDS. Of those families contacted, 2,017 were successfully interviewed (91%). With a few minor exceptions, the types of data collected at time 2 for the CDS paralleled that collected at time 1 (e.g., age graded assessments of the cognitive, behavioral, and health status of target children; assessments of parental and caregiver time inputs to children; teacher-reported child and parent time use in school; and other-than-time use measures of child and family functioning).

The PSID-CDS data set was selected for use in the analyses due to many of its inherent strengths that allow the current study to overcome limitations found in previous research examining possible variations in the relationships between fathers' and mothers' early parenting, later parental school involvement and student achievement. One major strength of the PSID-CDS is the inclusion of data on both mother and father involvement. This allows the current analyses to explore the impact of father and mother involvement simultaneously, an especially important issue when trying to identify the unique roles played by fathers in influencing their children's development. As suggested by Parke and his colleagues (Parke et al., 2002), the father-child relationship must be viewed in the context of a network of mutually interdependent relationships within the family that are part of their shared ecologies. The PSID-CDS data allows for this issue to be addressed in analyses. The longitudinal nature of the data is another major strength of the PSID-CDS data set. A primary problem that has hindered much of the research on fatherhood as well as studies linking early parenting to later student achievement is the lack of longitudinal data (Lamb, 2000, Weiss et al., 2006). Use of the longitudinal data available in the PSID-CDS allows the current study to make more definitive conclusions about possible causal relationship between early parenting, parental involvement in school and later student achievement that would not be possible with cross sectional data. A third major strength of the PSID-CDS data set that extends the current study are the sources of information from which data on maternal and paternal involvement are drawn. Much of the previous research documenting patterns of early paternal involvement as well as the impact of father involvement in school settings on student achievement relies on mother reports of fathers' behaviors (McBride et al., 2005; Nord, 1998; Pleck & Masciadrelli, 2004). Data in the PSID-CDS on fathers' early parenting behaviors and later school involvement are drawn from fathers themselves, thus overcoming this major limitation in previous research.

Participants

Analyses for the current study are focused on the longitudinal relationship between early parenting and later student achievement. As a result, we focused on children who were identified as living with the same secondary caregiver (i.e., father/father figure) at both time one and two of CDS data collection who was the child's biological or adoptive father, stepfather, or father-figure (n=1474). In addition, only children from the two largest demographic groups represented in the CDS time 1 data were used in these analyses: non-Hispanic White (79% of our sample) and Black (21% of our sample). Data from children of other races/ethnicities were not included in the present investigation because their numbers were too small to allow a more nuanced examination of race/ethnicity as a demographic variable in our analyses.[1] Given the focus of this study on the impact of early parenting behaviors on later parental school involvement and student achievement, we then narrowed the sample by selecting only those families with children between the ages of 2–5 years and were not yet attending school at time 1 data collection. We further reduced our sample by eliminating those families that had missing data on the dependent variables of interest for the analyses (i.e., Woodcock-Johnson achievement scores at Time 2). Finally, we excluded six families from the analyses that had discrepant data on key demographic variables (e.g., family size = 4; total children in family = 4). This process resulted in the use of a subsample of 390 children (202 boys, 187 girls; 308 White, 82 Black) who were between the ages of 2 and 5 at time 1 of data collection. These children had an average age of 3.53 years (*SD* = 1.12) at time 1 (see Table 1), and 8.58 years (*SD* = 1.18) at time 2.

Forty-one sibling pairs are represented in the sample of 390 children. Using data from multiple children within the same family can introduce potential bias in the standard errors computed when conducting structural equation modeling. To identify whether this potential bias was present in our analyses we calculated the "design effect" for the sample (Muthen, 2000). Given the average size of the clusters for our sample is 1.07, the maximum design effect would be 1.069. This small of an effect size is considered negligible, and therefore adjustments to standard errors are unnecessary in our analyses.

Variables

To identify items tapping constructs of interest in the analyses, we focused on questionnaires completed by the child's primary caregiver (typically the mother), and "other" caregiver (in our narrowed sample, the child's biological father, adoptive father, stepfather, or father-figure). First, we examined the CDS database and selected items theorized to represent each construct in the proposed model. Second, we employed exploratory factor analysis procedures to select the best representative items for each aspect of the model. Next, we formed latent factors representing different aspects of the model. Finally, confirmatory factor analysis was then used to verify that items identified for each of the involvement constructs fit together well. The variables included under each conceptual aspect of the proposed model are detailed below, including the number of items comprising each variable and item examples.

The racial/ethnic composition of the overall PSID-CDS sample at time 1 is as follows: 46% White; 41% Black; 7% Hispanic; 2% Asian; 1% Native American; 3% Other.

Demographic Variables

Based on previous research (e.g., Pleck & Masciadrelli, 2004), demographic variables used as controls in the model included target child age (in years), sex of the target child (0 = female, 1 = male), race of the target child (0 =non-Hispanic White, 1 = Black), biological status of the father/father figure (0 = biological father, 1 = step father/father figure), maternal and paternal educational levels, and family income measured as an income-to-needs ratio. Due to the invariant nature of the demographic variables (e.g., race, child gender) or the high correlation between time 1 and time 2 assessments (e.g., maternal education), only time 1 values for the demographic indicators are used in the analyses.

Early Parenting – Time 1

Parent-child household centered activities—Six items were taken from the questionnaires completed by mothers and fathers at time 1 to assess their level of interaction with their children during household centered activities. Fathers and mothers reported using a 5-point scale of 1 (*not in the past month*) to 5 (*every day*) on how frequently during the past month they interacted with their children while doing activities such as washing dishes together, preparing food together, etc. The Chronbach alphas for scores on these factors were .76 for fathers and .70 for mothers.

Parent-child child centered activities—Seven items were taken from the questionnaires completed by mothers and fathers at time 1 to assess their level of interaction with their children during child-centered activities. Fathers and mothers reported using a 5-point scale of 1 (*not in the past month*) to 5 (*every day*) on how frequently during the past month they interacted with their children while doing activities such as reading stories together, playing a game, etc. Alphas of .81 and .63 were found for fathers and mothers respectively.

Parental Limit Setting—Seven items were taken from the questionnaires completed by mothers and fathers to assess their level of participation in parental limit setting activities. Using a 5-point scale of 1 (very often) to 5 (never) parents reported how often they engage in parental limit setting activities such as setting limits on TV programs their child watches, setting limits on how much candy or sweets their child can have, etc. Unlike the other four measures of early parenting used in the analyses, lower scores on the parental limit setting variable reflect higher levels of participation in these activities. Alphas of .81 and .80 for fathers and mothers respectively were revealed.

Responsibility—In order to determine the level of parental participation in responsibility forms of involvement, four items were drawn from questionnaires completed by fathers and mothers. Using a 3-point scale of 1 (*child's other parent*), 2 (*both parents jointly*), and 3 (*I complete task*) fathers and mothers indicated who usually does responsibility forms of parenting activities such as making a pediatrician appointment, choosing child's activity, etc. Alphas of .77 and .67 were found for fathers and mothers respectively.

Affection—Five items were used to assess the frequency of parents' expression of affection directed towards their child. Using a 5-point scale of 1 (*not in the past month*) to 5

(*every day*) fathers and mothers were asked how often in the past month they had exhibited affection by hugging or showing physical affection to the child, told the child they love him/her, etc. These factors had alphas of .70 for fathers and .59 for mothers.

Parental Involvement at School and Student Achievement – Time 2

Parent Involvement at School—Two latent variables were created using confirmatory factor analysis procedures to represent paternal and maternal involvement in their children's schooling at time 2. Each latent construct consisted of eight items assessing parent's participation in school related activities (i.e., volunteered in the classroom, participation in formal conferences with child's teacher, participation in informal conversations with child's teacher, attended an extracurricular school event, attended a meeting of the PTA or other similar organization, met with a school counselor, had a formal meeting with child's principal, had an informal meeting with child's principal). Identical items were used for fathers and mothers. Parents responded to each item with the number of times they engaged in each activity (range 0 – 200). Data for these variables were right skewed with the majority of responses being between 0 and 6 and very few responses (often less than 5%) above 10. In order to achieve a more normal distribution for these variables and to reduce the influence of outliers the natural log of these variables was used. These global latent variables for maternal and paternal school-based involvement achieved an acceptable level of reliability when assessing this construct. Alphas on this measure for father and mothers were .73 and .71 respectively.

Student Achievement—Within the CDS standardized scores on reading (i.e., Letter-Word and Passage Comprehension) and math (i.e., Applied Problems) subscales of the Woodcock-Johnson battery (Woodcock & Johnson, 1990) are available at Time 2 as indicators of children's achievement, as well as a Broad Reading composite score made up of Letter-Word and Passage Comprehension subscale scores. A latent variable representing student achievement was created using all three WJ subscales available in the CDS (i.e., Letter-Word, Passage Comprehension and Applied Problems) in order to provide a broader assessment of student achievement for analyses rather than using the composite Broad Reading scores found in the CDS that is restricted to reading achievement. Means for each of the subscales were as follows: Letter-Word – 110.64 (SD=15.11, range = 59–157); Applied Problems – 109.05 (SD=17.74, range = 19–156); and Passage Comprehension – 113.37 (SD=12.65, range = 66–143). The alpha for this latent factor representing student achievement at time 2 was .71.

Analysis Plan

To test the proposed model, the structural equation modeling (SEM) program Mplus 5.0 (Muthén & Muthén, 2007) was used to conduct the analyses. Important to examining structural equation models is determining how well the hypothesized model fits the data. The chi-square test statistics was used as a measure of exact fit. However, it is very unlikely to find a model that exactly fits the data in real practice. In addition, the chi-square statistic may not be well behaved if the normality assumption is violated, and it is sensitive to the sample size. With large samples, even trivial discrepancies can lead to the rejection of the model being fitted (Loehlin, 1998). Due to these limitations it is suggested that multiple

measures of model fit be used. In addition to the chi-square this study also reports the CFI, the RMSEA, and the SRMR. For a well-fitting model it has been suggested that the CFI be greater than .95, the RMSEA be less than .06, and the SRMR be less than .08 (Hu & Bentler, 1999). The CFI compares the fit of the hypothesized model to the fit of a model that assumes complete independence of variables. RMSEA is a fit measure based on the population discrepancy and imposes no penalty for model complexity (i.e., it will favor models with more parameters). SRMR is an index highly sensitive to misspecified factor covariances or latent structures. In contrast, the CFI and RMSEA are more sensitive to models with misspecified factor loadings (Hu & Bentler, 1999).

As with most secondary analyses with large, national datasets, missing data is a problem that can influence the results. In terms of patterns in the missing data, there was an average of 39% missing data across the 13 variables used in the analyses (well within the normal range found in studies using large scale, longitudinal datasets), with a range of less than 1% to 43%. The only demographic variable that was found to be related to the patterns of missing data was race. Race, along with other demographic variables are included as controls when running the models, and its influence on each of the variables is taken into account. In addition, two steps were taken to address missing data. First, those families with missing data on the outcome variable of interest for our study (i.e., Woodcock-Johnson achievement scores at time 2) were dropped from the sample. Second, rather than using a casewise deletion approach to dealing with missing data that would significantly reduce statistical power and bias the parameter estimation, the full information, maximum likelihood estimation approach employed in Mplus 5.0 was used. This approach takes into account all the available data in estimating missing values, and assumes data are missing at random (MAR). Similar procedures for handling missing data have been employed by other investigators utilizing the PSID-CDS dataset (e.g., McBride, Schoppe-Sullivan & Ho, 2005; Yeung, Linver & Brooks-Gunn, 2002).

Model Testing

Testing the Proposed Model—The proposed conceptual model (i.e., Figure 1d) was fitted to examine the influence of early parenting behaviors on later student achievement, mediated by parents' school-specific involvement. Paths from each of the control variables to all variables in the model (not shown in Figure 1d) were included when testing the model in order to account for the influence of each. For each model mother and father early parenting at time 1 were correlated. The latent variable disturbances of mother and father school involvement at time 2 were also correlated. Because the indicators of the latent variables of father and mother early parenting at time 1 were identical for each parenting dimension (responsibility, affection, etc.) corresponding indicator errors were correlated. For example, for the latent variable father affection, the error of the "hug [CHILD]" indicator was correlated with the error of the latent variable mother affection indicator "hug [CHILD]." In addition, the relationships between early maternal and paternal parenting and later school involvement and student achievement were measured simultaneously, as well as the relationship between maternal involvement and father involvement. Because a primary focus of the study is on the role played by various dimensions of early parenting behaviors as opposed to a global measure of parent involvement, analyses were run for each of the five

types of early parenting assessed. In other words, five statistical models were fitted and tested. The estimates for key paths of interests are reported in Table 2 (standardized betas are reported in the text). All models are based on $n = 390$. Figure 2 highlights the significant paths that emerged when running the five models.

For parent-child household-centered activities, the model fit the data well [$\chi^2(582) = 921.35$, RMSEA = 0.04]. Fathers' parent-child household-centered activities at time 1 had a strong impact on later paternal school involvement ($\beta = 0.32$, $p < .01$), while later paternal school involvement was significantly and inversely related to student achievement at time 2 ($\beta = -16.76$, $p < .01$). However, fathers' household-centered parent-child activities at time 1 was unrelated to student achievement at time 2. Mothers' household-centered activities at time 1 had a significant impact on later maternal school involvement at time 2 ($\beta = 0.12$, $p < .05$), while later maternal school involvement was positively related to student achievement at time 2 ($\beta = 13.14$, $p < .05$). Like fathers, mothers' household-centered activities at time 1 did not directly impact student achievement at time 2.

For child-centered early parenting activities, the model fit the data well [$\chi^2(656) = 1081.51$, RMSEA = 0.04]. Fathers' child-centered activities with their children at time 1 was significantly related to later paternal school involvement ($\beta = 0.32$, $p < .001$), however later paternal school involvement was not significantly related to student achievement at time 2. Similarly, father participation in child-centered activities at time 1 was not directly related to student achievement at time 2. For mothers, participation in child-centered activities at time 1 was significantly related to later maternal school involvement ($\beta = 0.21$, $p < .05$), and later maternal school involvement was significantly related to student achievement at time 2 ($\beta = 8.62$, $p < .05$). Like fathers, maternal involvement in child-centered activities at time 1 was not significantly related to student achievement at time 2.

As with previous models, when examining the impact of parental limit setting the proposed model fit the data well [$\chi^2(652) = 1085.26$, RMSEA = 0.04]. Fathers' limit setting at time 1 had a significant, although inverse impact on later paternal school involvement ($\beta = -0.10$, $p < .05$) suggesting higher levels of paternal limit setting were related to higher levels of later paternal school involvement, while later paternal school involvement was significantly and inversely related to student achievement at time 2 ($\beta = -8.59$, $p < .05$). However, a direct effect of father' early limit setting on later student achievement was not revealed. Maternal limit setting at time 1 was not significantly related with maternal school involvement at time 2, while maternal school involvement was significantly related to student achievement at time 2 ($\beta = 10.05$, $p < .05$). Like fathers, a direct effect of mothers' early limit setting on later student achievement was not revealed.

When examining responsibility forms of involvement, the proposed model fit the data well [$\chi^2(446) = 770.89$, RMSEA = 0.04]. Fathers' participation in responsibility behaviors at time 1 was not related to paternal school involvement at time 2, but paternal school involvement was significantly and inversely related to student achievement ($\beta = -8.40$, $p < .01$). No direct link between early paternal responsibility and later student achievement was revealed. For mothers a direct link between maternal responsibility at time 1 and later maternal school involvement was revealed ($\beta = 0.18$, $p < .05$), as well as later maternal

school involvement and student achievement at time 2 (β = 10.82, $p < .01$). However, maternal responsibility at time 1 did not directly impact student achievement at time 2.

For affection, the proposed model fit was acceptable [$\chi^2(512) = 969.52$, RMSEA = 0.05]. Those fathers that showed more affection to their children at time 1 reported greater levels of paternal school involvement at time 2 (β = 0.27, $p < .05$), and later paternal school involvement was significantly and inversely related to student achievement at time 2 (β −10.33, $p < .01$). However, there was no direct effect from fathers' early affection and later student achievement. On the other hand, mothers' expression of affection to their children at time1 was not directly related to later maternal school involvement at time 2, although maternal school involvement was directly related to student achievement at time 2 (β = 10.70, $p < .01$). As with fathers, early maternal expressions of affection to their children were not directly related to later student achievement.

Previous research has suggested the ways in which parents become involved in child rearing activities are influenced by their partners' own levels of involvement. Taking this into account, the influence of early maternal involvement on fathers' later school involvement, as well as the influence of early paternal involvement on mothers' later school involvement were included when testing the proposed models (see Figure 1d – full conceptual model). For each of the five models tested, paths between fathers' early parenting behaviors and mothers' later school involvement, and between mothers' early parenting behaviors fathers' later school involvement were not significant (βs ranging from − 0.15 to 0.20, *ns*).

Discussion

Results from the current exploratory study lend partial support for the hypothesized relationships between early parenting, later parental school involvement and student achievement. As hypothesized, findings revealed some aspects of early parenting behaviors were significantly related to later parental school involvement for both parents, and as expected, the pattern in these relationships varied for mothers and fathers. In addition, differing patterns for fathers and mothers in the relationship between later parental school involvement and student achievement were also revealed. Of the 15 possible relationships examined in the models, only seven were the same for both fathers and mothers (five of which were the lack of a relationship between early parenting and later student achievement). In contrast to the hypothesized outcome, early parenting behaviors were not directly related to later student achievement for either fathers or mothers. By employing analyses that simultaneously examined the influence of both maternal and paternal early parenting on later parental school involvement and student achievement, these findings begin to shed light on how mothers and fathers may differentially contribute to their children's educational outcomes. Specifically, these exploratory findings suggest that the pathways between early parenting, later parental school involvement and student achievement may look different for fathers and mothers. As proposed by Parke and his colleagues (Parke et al., 2002), these findings lend support to the argument that fathers and mothers may assume different roles in raising their children, and these unique roles may have differential relationships with child outcomes such as student achievement. These exploratory findings also underscore the need to use caution when interpreting the research

literature examining the impact of parental involvement on student achievement that predominately focuses on maternal involvement.

Three surprising findings emerged from these analyses that warrant further exploration. First, neither fathers' nor mothers' early parenting behaviors were found to be directly related to later school achievement. This is in contrast to previous research suggesting that early parent-child relationships and parental participation in child-centered activities can lead to positive child outcomes, including cognitive development and student achievement (e.g., Magill-Evans & Harrison, 2001; Roggman et al., 2004; Weiss, Caspe, & Lopez, 2006). One possible explanation for a lack of a significant relationship may be the way in which early parenting behaviors were assessed. Although several measures were used to assess early maternal and paternal parenting behaviors, the five dimensions included in the analyses may not have been sensitive enough to capture the types of parenting behaviors that could have a positive impact on later student achievement. Although some researchers have argued that general parenting and positive attitudes, values and practices of parents in raising young children leads to later cognitive development and student achievement (e.g., Weiss et al., 2006), others have suggested it may be that only specific forms of early parenting behaviors such as visiting the library or museum, talking about family history or working on projects together that are directly related to later cognitive functioning and student achievement (e.g., Nord, Brimhall & West, 1997). These contradictory findings from the current study then raise an important question for future research: Is positive parenting in general during the preschool years (e.g., playing with a child, expressing affection to the child, monitoring the child's behaviors and activities) enough to facilitate children's school readiness and later achievement, or should parents be encouraged to be involved in specific forms of parenting behaviors that will better prepare their children for success in school? Answers to this question will provide useful insight for professionals providing parental support programs for families.

A second intriguing finding from the current study was the differing relationship between early parenting and later parental school involvement for fathers and mothers. Four of the five categories of fathers' early parenting behaviors were found to be significantly related to their later school involvement, while only three early parenting behaviors were found to be significantly related to later school involvement for mothers, two that paralleled fathers (i.e., Household-Centered and Child-Centered parent-child activities) and one (i.e., Responsibility) that was different from fathers. Although surprising, this finding is also somewhat encouraging. These results suggest that those fathers that establish patterns of being involved early in their children's lives also establish similar patterns of involvement to the context of school settings. One possible explanation for this could be found in previous research suggesting that the paternal role is less scripted and more discretionary than the maternal role (e.g., Lamb, 2002; Parke, 2002). Mothers have historically been the primary caretakers when their children are young, and the scripted nature of their early parenting roles has evolved over time. Similar scripts for maternal or paternal involvement in school settings are not as well established, thus a more varying relationship between early mother involvement and later school involvement might be expected (i.e., mothers are involved in early parenting regardless of how they view their roles in their children's formal schooling). It has only been in recent years that societal expectations for fathers to become more

involved in childrearing has emerged (Lamb, 2004), and although fathers now appear to be more involved than previous generations of dads, these increases have been small relative to mothers' involvement (see Pleck & Masciadrelli, 2004 for a complete review). Due to this less scripted nature of the paternal role, findings from the current study would suggest that those fathers who are more involved with their children during the preschool years are able to move this commitment to the ways in which they become involved with their children's formal schooling. Future research is needed to explore this possible explanation in more detail.

A third intriguing finding that emerged from the current study was the contrasting pattern in the relationship between parental school involvement and student achievement for mothers and fathers. In four of the five of the models tested father involvement in school activities was inversely related to student achievement, while for mothers this relationship was positive in all five of the models tested. One possible explanation for this finding is that mothers take on primary responsibility for being involved in their children's education, and that fathers become involved when their children are struggling at school. Such an explanation is consistent with previous research suggesting that parents may become more involved in their offspring's education when their children are struggling academically (e.g., Pomerantz, Grolnick, & Price, 2005). The current findings suggest that fathers may be playing an "additive" role when their children are struggling academically and they become engaged in their children's schooling. This finding is especially important given the positive relationship between fathers' early parenting and their later school involvement. Further research is needed to add more insight on the possible reasons for these varying patterns in the relationship between father and mother involvement in school and student academic achievement.

Although results from this exploratory study are encouraging, caution must be used in drawing conclusions from the findings. Although the PSID-CDS is a comprehensive compilation of data outlining various aspects of parental functioning and child outcomes, there are limitations that must be acknowledged, especially when examining the impact of father involvement. First, our findings are limited to residential fathers only; the small number of noncustodial, nonresidential biological fathers in the overall PSID-CDS sample and the relatively low response rate for this important ecological context for fathering precluded the use of this family type in the current analyses. A second limitation of the data set revolves around the ethnicity of families represented in the PSID-CDS. Forty-six percent of the respondents in the CDS were Caucasian and 41% were Black. The small number of Hispanic (267; 7%), Asian (64; 2%), and Native American (19; 1%) families in the overall CDS limited the ability to include these populations in the analyses, thus limiting the research, policy, and programmatic implications that can be drawn from the findings. A third limitation of the data set relates to the way in which father and mother involvement in their children's education was defined and measured. Father/mother involvement in school is a multidimensional construct that has been conceptualized and defined in different ways (e.g., Epstein, 1996; Grolnick & Slowiaczek, 1994). The current study focused on only four dimensions of parental school involvement in children's education (i.e., talking with the child about school, volunteering at school, formal communications with school personnel, informal communications with school personnel). This narrow conceptualization fails to

capture the many ways in which parents can become involved in their children's education, including non-school based, yet academically-related activities that benefit both children and their schools. A fourth limitation relates to the ways in which early parenting was assessed in the PSID-CDS. Previous research has suggested that early parental involvement consists of several dimensions (Day & Lamb, 2004; Lamb & Tamis-LeMonda, 2004; Pleck & Mascidrelli, 2004; Schoppe-Sullivan, McBride & Ho, 2004), yet the current study only focused on five (e.g., parent involvement in child-centered activities, parent-child household centered activities, parental limit setting, responsibility, and affection). A fifth limitation of the data stems from the dependence on the Woodcock-Johnson assessment tool as an indicator of student achievement, along with the assessment of student achievement at one time point. Although multiple indicators of student achievement at multiple time points would be desirable, our analyses were restricted to the data that are available in the PSID-CDS data set. A sixth limitation of the data revolves around the somewhat low levels of reliability found for some variables used in the analyses. These low levels of reliability for some items decreases Type I error while increasing Type II error. Thus, our current reliability for some of our measures yields estimates are conservative. Another limitation of the current analyses is the lack of longitudinal information on parental involvement in schools. For this sample, parent school involvement and student achievement were both assessed at time 2, thus limiting the ability to make definitive conclusions about the causal nature of the relationship between these two variables. Finally, it is important to note that although items comprising measures used in the analyses have parallel wording, they may not be measuring the exact same construct for fathers and mothers. The present study focuses on the impact of early parenting on later student achievement, without assuming the underlying structure of involvement is similar for fathers and mothers. Although an examination of the underlying structure of measures of parental involvement to identify similarities and/or differences for fathers and mothers is an important empirical question that needs to be address, it falls outside the focus of the current study.

Despite these limitations, the richness of the PSID-CDS data set provides provocative, albeit exploratory information on mothers' and fathers' differential relationships between early parenting, later parental involvement in school and student achievement. Although caution must be used when drawing implications from the findings, results from this exploratory study suggest that fathers' early parenting may have a direct impact on their later involvement in school, while their school involvement was negatively related to later student achievement. In contrast, a different pattern in the relationships between early parenting and later parental school involvement were revealed for mothers, while mothers' school involvement was positively related to student achievement. These findings that run counter to the hypothesized relationships underscore the need for future research on this topic. Future research is needed that gathers data on parental involvement in home and school settings from multiple respondents (e.g., parents, teachers, children, school personnel), collects parent involvement data in home and school settings at multiple time points, and includes large and diverse samples that allow for multiple group comparisons to explore how these relationships may vary across racial/ethnic groups. It will only be through expanded approaches to examining this topic that researchers, educators and policy makers alike can begin to make definitive conclusions about the unique and overlapping roles that

fathers and mothers may play in home and school settings, and how these roles may impact child outcomes.

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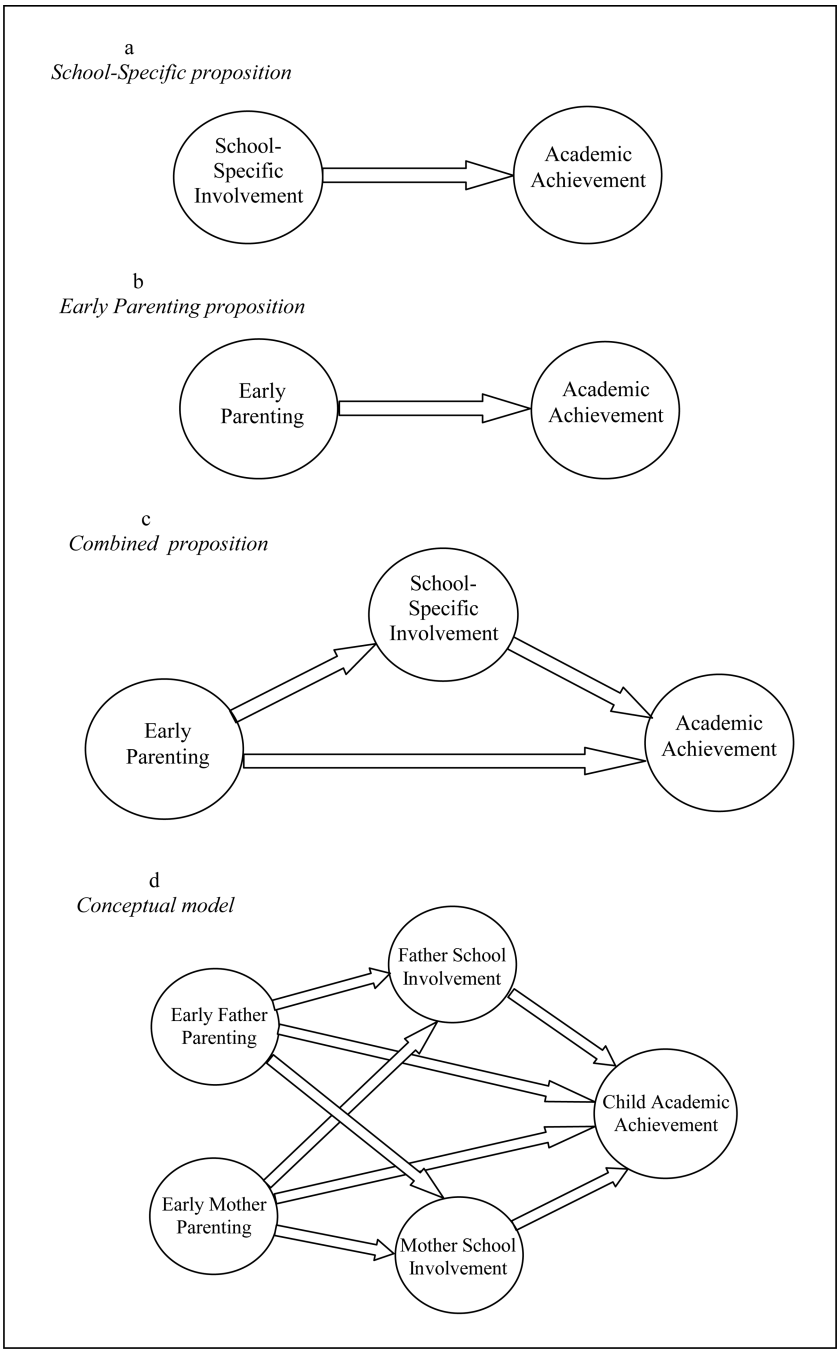

Figure 1.
Propositions and conceptual model

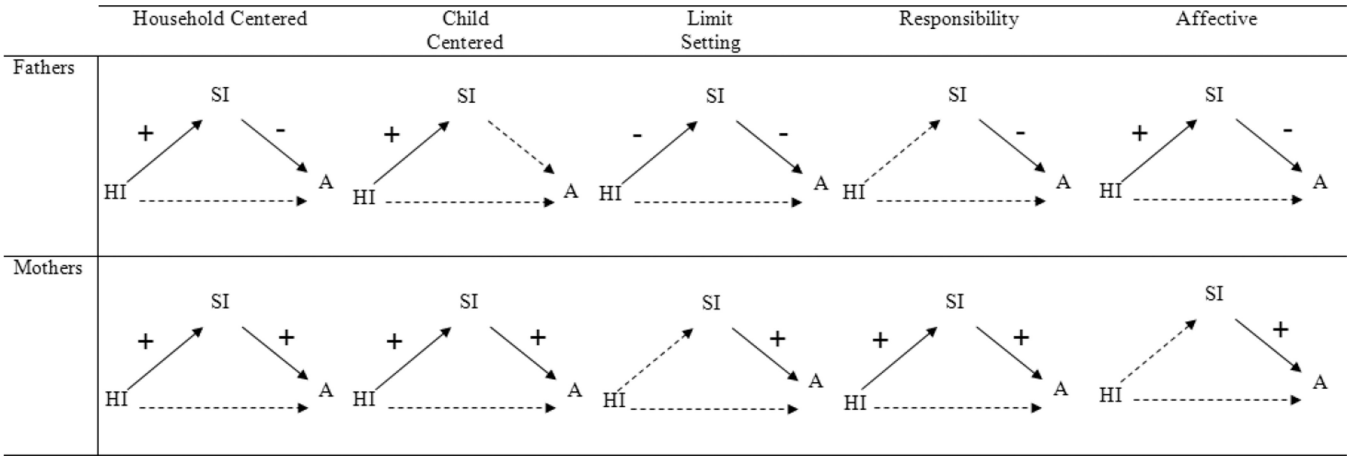

Figure 2.

Direction of Significant Paths

Note: HI = Home involvement Time 1. SI = School involvement Time 2. A = Child achievement Time 2. Plus (+) and minus (−) signs indicate the direction of effects. Dashed arrows indicate non-significant paths. Solid arrows indicate significant paths.

Table 1

Demographic Characteristics (*n=390*)

Characteristic	Mean	SD	Range
Child Gender[a]	.48	.50	0, 1
Income to Needs Ratio	3.66	2.55	0.0 – 24.25
Child's race[b]	.21	.41	0, 1
Child age (time 1)	3.53	1.12	2 – 5
Biological father[c]	.97	.17	0, 1
Fathers' years of Education	13.65	2.22	6 – 17
Mothers' years of Education	13.47	2.99	0 – 17

[a] Gender is coded as: 0 = male, 1 = female

[b] Child's race is coded as: 0 = white, 1 = black

[c] Biological father coded as: 0 = non-biological father, 1 = biological father

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Table 2

Model Results (*n=390*)

	Household Centered		Child Centered		Parental Limit Setting	
Parameter Estimate	**B(SE)**	**β**	**B(SE)**	**β**	**B(SE)**	**β**
Structural Model						
Father Invol. T1 → Father School Invol T2	0.32(0.09)***	.75	0.32(0.09)***	.563	−0.10(0.04)*	−.37
Father Invol. T1 → Mother School Invol. T2	−0.04(0.05)	−.11	0.03(0.05)	.059	−0.02(0.03)	−.07
Father Invol. T1 → Child Achievement T2	7.80(4.92)	.45	−3.05(3.42)	−.134	0.54(1.46)	.05
Mother Invol. T1 → Mother School Invol. T2	0.12(0.05)*	.33	0.21(0.10)*	.240	0.06(0.04)	.18
Mother Invol. T1 → Father School Invol. T2	−0.12(0.08)	−.26	0.05(0.15)	.044	−0.01(0.06)	−.03
Mother Invol. T1 → Child Achievement T2	−3.13(3.72)	−.16	11.75(6.35)	.267	2.24(1.98)	.13
Father School Invol. T2 → Child Achievement T2	−16.76(7.19)*	−.42	−7.15(4.98)	−.176	−8.59(4.05)*	−.21
Mother School Invol. T2 → Child Achievement T2	13.14(5.20)*	.26	8.62(4.01)*	.172	10.05(3.99)*	.20
Model Fit						
χ^2 (df)	921.353(582)		1081.509(656)		1085.261(652)	
CFI	.853		.828		.849	
RMSEA	.039		.041		.041	
SRMR	.077		.084		.072	

	Responsibility		Affection	
Parameter Estimate	**B(SE)**	**β**	**B(SE)**	**β**
Structural Model				
Father Invol. T1 → Father School Invol T2	0.11(0.23)	.06	0.27(0.11)*	.28
Father Invol. T1 → Mother School Invol. T2	−0.01(0.15)	−.01	0.04(0.07)	.05
Father Invol. T1 → Child Achievement T2	0.67(7.66)	.01	3.68(3.80)	.09
Mother Invol. T1 → Father School Invol. T2	−0.15(0.12)	−.15	0.20(0.24)	.07
Mother Invol. T1 → Mother School Invol. T2	0.18(0.08)*	.23	0.19(0.17)	.08
Mother Invol. T1 → Child Achievement T2	0.49(4.00)	.01	6.20(8.33)	.05
Father School Invol. T2 → Child Achievement T2	−8.40(3.58)*	−.21	−10.33(3.85)**	−.25
Mother School Invol. T2 → Child Achievement T2	10.82(4.12)**	.22	10.70(3.88)**	.21

	Responsibility		Affection	
Parameter Estimate	**B(SE)**	**β**	**B(SE)**	**β**
Model Fit				
χ^2 (df)	770.889(446)		969.516(512)	
CFI	.866		.819	
RMSEA	.043		.048	
SRMR	.064		.063	

Note: T1 = Time 1. T2 = Time 2. Only paths relevant to the hypothesized relationships between early parenting, later parental school involvement and student achievement are included in the table. The following are controlled for variables in the model: mother's education level, father's education level, family's income-to-needs ratio, race (white, black), child's sex, child's age, and father's biological relationship to child (biological, non-biological).

$^{\dagger}p < .10$.

$^{*}p < .05$.

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

$^{***}p < .001$.