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Including Fathers in the Picture: A Meta-Analysis of Parental Involvement and Students' Academic Achievement

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Extant research on parental involvement in education has been conducted largely without respect to which parent is involved. The implicit assumption is that family–school relationship frameworks function similarly for fathers and mothers. Although there is a growing body of research examining fathers' involvement in education, this assumption has not been tested. In this meta-analysis, we examined the relative strength of the association between educational involvement of fathers versus mothers and achievement of school-age children (kindergarten to 12th grade). The association of involvement with achievement over time (i.e., longitudinal studies) was stronger than for cross-sectional studies. Parental involvement in education was positively associated with student achievement and the relation between involvement and achievement was equally strong for fathers and mothers, although mothers' mean levels of involvement were higher than fathers'. Moderator analyses across the different types of involvement suggested that school-based involvement and intellectual enrichment at home was more strongly related to achievement for mothers than for fathers, although there were no differences in mean levels of involvement.

Keywords: parental involvement, parent participation, fathers, gender, achievement

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Ideals around fathering have evolved from the stern disciplinarian and moral teacher to the breadwinner of the family to the modern involved father and finally, the father as coparent (Lamb, 2010; Pleck, 2012). Whereas the expectations for and experiences of fathering have increased, the parenting literature is still focused largely on mothers. It is believed that mothers are more intimately involved in their children's care and education than are fathers (e.g., Lamb, 2010; Lareau, 2003; Parke, 2002). Despite of the growing literature on fathering that highlights certain aspects unique to fathers and provides a framework to understand fathering (e.g., Lamb, Pleck, Charnov, & Levine, 1985, ¹⁹⁸⁷; Pleck, 2012), fathers' involvement *in education* has not been systematically distinguished from general fathering or from more general research on parental involvement in education and family school relationships. The present study focused on fathers' engagement in the strategies and practices outlined in the extant theories and frameworks for parental involvement in education and family school relationships (i.e., Epstein, 2001; Hill & Tyson, 2009; Grolnick & Slowiaczek, 1994). Parental involvement in education has been defined as "parents' interactions with schools and with their children to promote academic success" (Hill et al., 2004, p.

1491) and often includes a commitment of parental resources in the academic arena of children's lives (Grolnick & Slowiaczek, 1994). In this way, parental involvement includes parents' educational goals and expectations and the ways in which parents support achievement at home, at school, and within the parent–child relationship (Hill & Tyson, 2009).

Theory and research on parental involvement in education often do not distinguish between fathers and mothers, and are most likely to be based on mothers only, even in two-parent families (Greif & Greif, 2004). By failing to explicitly include fathers and taking a one-size-fits-all approach regardless of parent gender, parental involvement in education programs and policies do not capitalize on potential father–mother differences. Whereas most of the research that informs educational policies and interventions excludes fathers, there are numerous disparate studies that have involved fathers. This calls for a systematic review of the literature to determine the extent to which fathers are engaged in family school relationship strategies and whether it is positively related to student achievement, and whether the strength of the relation is comparable to that of mother involvement. Such knowledge will inform policies and programs targeting family school relationships about whether to differentiate by gender of the parent and whether to increase their efforts to include fathers.

Accumulating evidence suggests that there might be a positive relation between father involvement and academic outcomes for school-age children (McBride, Schoppe-Sullivan, & Moon-Ho, 2005; Nord, 1997; Parke, 2002). However, studies that found the strongest positive associations between father involvement and children's cognitive and academic outcomes have been criticized for the lack of methodological rigor and quality (Coley, 2001; Pleck, 2010), and some studies failed to demonstrate a positive

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relation (see the review in Lamb, 2010). Nonetheless, numerous literature reviews have concluded that there is a positive relation between father involvement and child academic outcomes (Cabrera, Tamis-LeMonda, Bradley, Hofferth, & Lamb, 2000; Downer, Campos, McWayne, & Gartner, 2010; Lamb, 2010; Margiglio, Amato, Day, & Lamb, 2000; Sarkadi et al., 2008). Furthermore, meta-analytic studies focusing on nonresident fathers (Amato & Gilbreth, 1999; Adamsons & Johnson, 2013) equally found a positive association between father involvement and achievement. Another meta-analysis focused on young children (ages 3 to 8) within a 10-year period (1998–2008) found an even stronger positive relation between fathers' direct involvement and their children's cognitive outcomes (McWayne, Downer, Campos, & Harris, 2013). Although these meta-analyses focused on fathers' involvement, they aggregate parental involvement with other types of activities not specific to educational outcomes, and do not distinguish among the types of parental involvement in education defined by theories associated with family school relationships. Furthermore, they are limited to specific populations, such as nonresident fathers (Amato & Gilbreth, 1999; Adamsons & Johnson, 2013) or younger children (McWayne et al., 2013). Broadening this literature, the present meta-analysis specifically examined the strength of the relation between fathers' involvement in education and child achievement within the framework of family school relationships across elementary and secondary school levels.

There is no overarching theory up-to-date explaining whether and how fathers and mothers differ in their educational involvement. However, several bodies of research suggest that the association between parental involvement and achievement is likely to differ by parent gender. Key differences might arise from the different meanings attached to parental involvement because of the gendered parental roles of fathers and mothers. The division of labor theory suggests that men spend more time in paid work while women spend more time on household duties and child rearing (Lamb, 2010). Pleck (2012) defined paternal role identity as fathers' construal of their fathering role, composed of several domains, including the breadwinner and caregiver role. Gender-congruent domains (e.g., breadwinner) were more likely to be closely associated with fathers' behaviors, whereas less gender-congruent behaviors (e.g., participation in children's education) might be more closely associated with their perceptions of their partner's attitudes and behaviors (Maurer & Pleck, 2006). Parents' educational roles tend to be influenced by the expectations held by parents and their significant groups (e.g., their family, the school and teachers, the workplace) for their behaviors (Hoover-Dempsey & Sandler, 1997). Such expectations are inevitably gendered, such that U.S. mothers were subject to stronger role expectations than fathers for daily educational involvement and participation in their children's schools (Lamb, 2010; Parke, 2002). In several studies, mothers were additionally found to be more frequently involved in their children's education and endorsed warmer more supportive parenting styles conducive to academic improvement compared with fathers who were harsher and more achievement oriented (e.g., Kim & Fong, 2014; Levin et al., 1997; Rogers et al., 2009). However, when involved with their children, fathers were more likely to be more cognitively stimulating than mothers: They tended to use more cognitively challenging strategies, such as using unfamiliar words, asking frequently for clarifications, and

making problem-solving demands on their young children (Parquette, 2004; Parke, 2002). In sum, this suggests that on the one hand, because of the larger variation and cognitive stimulation of fathers' involvement (vs. mothers' involvement), their involvement might be more effective when they are more involved and have a stronger association with children's achievement. At the same time, it might also be the case that mothers' involvement might have a stronger association with achievement because they play a more central role in their children's education and are involved in more aspects of their children's daily education-related activities in home and school settings. In spite of the differences between mothers and fathers, they both play a critical role for children and are likely to influence their cognitive development in equally important ways, which this study attempts to address.

The extent to which parents are involved in their children's education is important for children's achievement because it reflects parents' concern for their children's education, but *more* involvement is not always conducive to enhancing children's achievement (Pomerantz, Moorman, & Litwack, 2007). Thus, it is important to identify the ways in which parents are effectively involved. Extant theories and frameworks distinguish between involvement based at school and at home (Epstein, 2001; Epstein & Sanders, 2002; Pomerantz et al., 2007). These distinctions are not only helpful for policy making but also reflect two realms that interact with each other as family school relationships can influence the way parents are also involved at home. Hill and Tyson (2009) conducted a previous meta-analysis that is distinct from the current study and is based on a different body of articles. This study distinguished three types of involvement relevant to student achievement, which we draw on: *School-based involvement* (parental participation in school-based activities; e.g., attending parent-teacher meetings, volunteering at school, or participating in school governance), *home-based involvement* (parents' involvement at home; e.g., homework assistance, visiting a museum, or reading to their child), and *academic socialization* (parents' educational goals and expectations for their children, as well as their communication to their children about parental expectations for education, its value and utility). *Homework assistance* is a subtype of home-based involvement where parents are engaged directly in school-related activities at home, such as helping with homework or structuring the home to support children's learning at home (e.g., Grolnick, 2003; Hill & Tyson, 2009). However, another type of home-based involvement, *intellectual enrichment*, refers to home activities that are not directly related to school but can help develop children's cognitive and metacognitive processes, such as taking children to a museum (Pomerantz et al., 2007). Among types of involvement, academic socialization had the strongest relation with academic performance for adolescents whereas the relations were weaker for school-based involvement and mixed for home-based involvement, based on this meta-analysis (Hill & Tyson, 2009).

This is among the first studies to our knowledge, to examine how these findings generalize between mothers and fathers. In spite of the dearth of literature on the topic, based on related theories and empirical studies, we hypothesize that the strength of the association might be similar across the different types of involvement for fathers and mothers, except for school involvement. Parents were found to influence children's achievement largely through motivation and skill development whether in home

or school settings (Pomerantz et al., 2007). Parents provide their children with motivational resources by conveying to them the value of education while also helping them develop skills by assisting them in schoolwork or engaging them in cognitively stimulating activities, such as visiting a museum. These mechanisms are not expected to differ by parent gender, so involvement strategies that tap into motivation and skills in a positive manner are likely to be beneficial regardless of parent gender (Hoover-Dempsey & Sandler, 1997).

Whereas there may be similar mechanisms by which parents influence child achievement, mother–father differences might arise because of gendered parental roles of fathers and mothers. This applies to all settings but might be especially salient for school-based involvement, because this type of involvement largely depends on parents' availability, ability, and willingness to take time off work to participate in their children's school-related activities and school personnel may be more accustomed to working with mothers. In the United States, fathers were consistently less involved in school settings compared with mothers (Nord, 1997; Shumow & Miller, 2001) but no salient mother–father differences were found for the other types of involvement (Eccles & Harold, 1996; Nord, 1997). This suggests that fathers might not find it gender congruent to be involved in their children's schools (Pleck, 2012). When fathers were involved, they tended to play a very different role compared with mothers: Fathers either attended athletic activities that were not directly related to academic performance or intervened when children faced disciplinary action (Eccles & Harold, 1996; Lareau, 2003). We thus hypothesize that fathers might have lower mean levels of school-based involvement compared with mothers. Also, because of the plausibly different ways in which fathers engage in school-based involvement, we expected fathers' school-based involvement to be more weakly and even negatively associated with achievement compared with mothers. Consistent with prior research, we expect mothers' school-based involvement to be positively associated with achievement.

The strength of the relation between involvement in education and achievement may also vary by child developmental stage, ethnicity, and child gender. Fathers' and mothers' involvement are likely to be differentially associated with achievement across children's grade levels because of differences in gendered parenting roles at various developmental periods. On the one hand, mothers were found to engage more in direct forms of involvement, such as assisting with homework or school involvement, compared with fathers, especially for children in elementary school (Lamb, 2010; Parke, 2002). Furthermore, mothers were found to engage in more developmentally appropriate strategies when children were younger and scaffolded their teaching whereas fathers were less likely to do so and were harsher and less patient (Laakso, 1995; Kim & Fong, 2014). As children reached adolescence, direct forms of parental involvement as often provided by mothers tended to decrease (e.g., Singh et al., 1995). Adolescence is a period marked by a greater need for autonomy, dramatic cognitive development, problem-solving skills, and the pursuit of multiple goals (Hill, Bromell, Tyson, & Flint, 2007; Hill & Chao, 2009). Only those mothers who are still able to provide developmentally appropriate indirect forms of involvement and able to navigate the complex schooling system once their children reach middle and high school are likely to continue being involved. On the other hand, fathers'

involvement remained relatively stable over time because they were not that intensively involved when their children were younger and continued to be involved at similar rates as children reached adolescence (Nord, 1997). This suggests that mothers are more likely to display a larger variability in their involvement compared with fathers as children grow out of their developmental needs for direct parental participation in their education. We thus expect mothers' involvement to be more strongly associated with achievement than fathers for older children after elementary grades, as those who remain involved later are likely to be very committed to their children's education and able to adapt their involvement to their children's needs.

Most previous meta-analyses conducted on parental involvement and achievement did not find any ethnic differences (Fan & Chen, 2001; Hill & Tyson, 2009; Jeynes, 2005). However, none of these meta-analyses focused on fathers or relative relations of fathers' and mothers' involvement and achievement. Several factors can influence ethnic variations in fathers' versus mothers' involvement and their associations with child achievement. African American, Latino, and Euro American fathers hold different cultural values and gender role attitudes, and display differences in socioeconomic status that influence men's education levels and ability to secure a job that can provide for the family (Hill & Torres, 2010; Hofferth, 2003). Euro American fathers were more likely to have higher levels of educational attainment and be the main breadwinner of the family compared with other ethnic groups (e.g., Lamb, 2010). Although Latino men reported more gender traditional attitudes, they were found to engage more in caregiving activities (McLoyd, Cauce, Takeuchi, & Wilson, 2000). Compared with Euro American fathers, African American fathers were also found to perform more childcare tasks (McAduo, 1988), and played more with their children, although they read less to them (Marsiglio, 1991). This suggests that there are ethnic differences in father involvement that are likely to influence their association with child achievement. The strength of the association between fathers' involvement and achievement might be weaker for fathers from ethnic groups that have lower education levels and hold gender traditional attitudes compared with other groups, but at the same time, their involvement might still be strongly associated with achievement if those fathers are closely involved in the daily care of their children because their wives are working. The direction of the influence resulting from these interactions is yet unclear, which we explore in this study.

Finally, mother–father differences may vary by child gender. The gender congruence theory posits that parents have greater influence on same-sex children through behavioral modeling and by feeling greater responsibility for same-sex children, but gender stereotyping and identification was found to be stronger for males than females (Ruble, Martin, & Berenbaum, 2006). Although several studies found that fathers did not have a stronger effect on sons than on daughters (Lytton & Romney, 1991; Russell & Saebel, 1997), other studies found fathers to be more involved with their sons than with their daughters (Barnett, Marshall, & Pleck, 1992; Cabrera et al., 2000) and sons especially benefitted from paternal involvement (Williams & Radin, 1999). Coupled with fathers' more cognitively stimulating and challenging strategies (e.g., Parke, 2002) as well as their encouragement of their children, especially boys, to be competitive, independent, and risk taking (e.g., Manning & Saidi, 2010), we expect fathers' educational

involvement to be more strongly associated with sons' achievement whereas mothers' involvement might not differ by child gender.

The Current Study

The main goal of this study was to investigate the relative strength of the association between parental involvement in education for fathers versus mothers and achievement outcomes of school-age children (Grades K–12) across different types of involvement. We also examined in an exploratory manner how the strength of the association between parental involvement in education and achievement differed by child grade level, ethnicity, and gender. Specifically, we addressed the following research questions: (a) What is the overall relation between parental involvement in education and student achievement for fathers and mothers? How do they compare to each other? Are there any significant differences in the mean levels of involvement for mothers and fathers? (b) How does the strength of the association between involvement and achievement and mean levels of involvement vary across the different types of involvement for fathers versus mothers? And (c) How does the strength of the relation between involvement and achievement and mean levels of involvement vary by child grade level, child gender, and ethnicity for fathers versus mothers? First, we hypothesized that the association between involvement and achievement would be significant for both fathers and mothers and that they would be equally strong. However, we expected mothers' mean levels of involvement to be higher than fathers'. In addition, we expected that the strength of the association between involvement and achievement would be the same across the different types of involvement we distinguished except for school involvement, where mothers' involvement might be more strongly associated with achievement than fathers' involvement and mothers' mean levels of school involvement might be higher than fathers'. Last, we hypothesized more variation across child grade level for mothers than fathers and we did not expect any variation for either mothers or fathers by ethnicity, although we expected stronger effect sizes for father–son samples.

Method

Study Sample

Our meta-analysis included 52 empirical studies¹ representing 390 correlations for the relation between parental involvement (mothers or fathers), and achievement. Of these reports, 31 reported the mean levels of fathers' and mothers' involvement. Over 52,085 father–child dyads and 65,534 mother–child dyads were represented. Sample sizes ranged from 60 to 26,460 families for studies including fathers and 60 to 35,100 for studies including mothers. Twenty-nine studies included an effect size for both mothers and fathers separately, whereas five studies included only fathers and 18 studies included only mothers. In our total study sample, 29 published journal articles, two published technical research reports, one unpublished conference presentation, 19 unpublished dissertations, and one book chapter were included.

Twelve intervention studies were identified but we were not able to include any in our meta-analysis because the effect sizes

were aggregated across parents and so we could not retrieve a separate effect size for mothers and/or fathers. Only three studies mentioned the proportion of mothers and fathers included in the study. Two studies that reported the percentage of fathers and mothers who participated (Balli, Demo, & Wedman, 1998; Kiesner, 1997) suggested that the majority of parents involved in these interventions were mothers. One study (Tamayo, 1992) reported the percentage of mothers and fathers included, but their definition of "parent" was broader, including other parent figures (i.e., aunts, uncles, guardians), and this study did not specify which parent had actually participated in the intervention.

Literature Search Procedures

We conducted an exhaustive literature search of journal articles, chapters, dissertations, published empirical reports, and unpublished reports between 1980 and 2013. We focused on the past 30 years to reduce potential cohort effects and it reflects a period of time when research on parental involvement in education and family school relationships increased substantially. Studies needed to provide enough information to be able to retrieve or calculate an effect size for the relation between father and/or mother involvement and children's academic outcomes. First, we conducted online database searches on *ERIC*, *PsycINFO*, *Family & Society Studies Worldwide*, *Sociological abstracts*, and *Dissertation Abstracts International*. A combination of the keywords in the following groupings was used: (a) *school involvement, parent participation, parent school relation**, *family involvement in education*; (b) *fatherhood, fathers, father attitudes, father involvement*; (c) *academic achievement, student performance, student achievement*; and/or (d) *mother involvement; maternal involvement; mothers*. These yielded a total of more than 3,772 studies whose abstracts were examined for inclusion/exclusion.

In a next step, we used an ancestry approach and reviewed the reference lists of studies retrieved, as well as other review articles and seminal articles to identify further relevant studies. Then we hand-searched journals such as *Fathering: A Journal of Theory, Research, and Practice About Men and Fathers*, *Journal of Family Issues*, *Journal of Men's Studies*, *Marriage and Family Review*, *Journal of Family Psychology*, *Journal of Marriage & Family*, *Developmental Psychology*, *Child Development*, *Journal of Educational Psychology*, and *American Educational Research Journal*. Next, papers presented at conferences such as the American Educational Research Association, Society for Research in Child Development, and National Council of Family Research were searched. In addition, we screened the bibliography of websites housing national databases that included both father and mother measures (e.g., Panel Study of Income Dynamics, the National Survey of Families and Households, the National Longitudinal Study of Youth, the National Longitudinal Study of Adolescent Health, or the Longitudinal Study of Youth) for working papers and publications. Additionally, we hand-searched several books and edited volumes that were focused on fathers and/or parental

¹ These 52 studies *excluded* the seven studies that reported on the same dataset. In total, there were 59 documents reporting 52 studies: Five studies were counted only once although they were reported by two documents, and three studies were based on the National Household Education Survey (NHES) dataset and counted only once.

involvement in education (Chavkin, 1993; Christenson & Sheridan, 2001; Christenson & Reschly, 2010; Day & Lamb, 2003; Flouri, 2006; Lamb, 2010; Marsiglio, 1995; Parke, 2002; Snarey, 1993; Tamis-LeMonda & Cabrera, 2002). Through this search, we identified 10 authors whose work appeared more than once throughout the literature search process, as well as 11 key researchers in the field of parenting that might have unpublished data on fathers and contacted them directly, requesting copies of any relevant unpublished or in-press manuscripts. We received four responses providing data, and included one additional study. We additionally contacted two authors of book chapters that presented empirical data on fathers' involvement and achievement, but did not include sufficient information to calculate effect sizes. Unfortunately, these authors were unable to provide additional information.

Inclusion and Exclusion Criteria

In our study, we included *both* published and unpublished research to reduce the threat against publication bias and to be as inclusive as possible. We limited our meta-analysis to studies published in English and did not include foreign papers in non-English languages, which ultimately did not reduce our scope of papers. The following a priori criteria had to be met to be included in the final dataset. First, parental involvement needed to be defined as specific strategies that fathers and/or mothers use intended to enhance their children's achievement-related outcomes as defined in the educational literature (e.g., Hill & Tyson, 2009). Consequently, studies that focused on general parenting not specific to education or parenting styles (i.e., the amount of time fathers spent with children or paternal warmth) were excluded from the analyses. We included measures that fit our definitions of parental involvement in their children's education, which included school involvement, home involvement (homework assistance and intellectual enrichment), and academic socialization. When the study reported a type of involvement that did not allow a clear distinction and overlapped across the types of described, we coded this as "general parental involvement."

Additionally, we included only studies with some measure of children's academic outcome, such as school grades, GPA, teacher ratings of children's school performance, standardized test scores, or any test to measure achievement (e.g., the Woodcock-Johnson Tests of Cognitive Abilities). These included domain-specific cognitive and literacy skills (e.g., measures of reading, math, letter recognition, and numeracy skills), but excluded general cognitive outcomes, such as measures of attention or task persistence, because most research and policies on parental involvement in education target improving school-based educational outcomes.

To compute an effect size of the relation between parental involvement in education and achievement, studies needed to include correlations or other information (e.g., frequencies for categorical variables) sufficient to calculate an estimate of the effect size. Naturalistic cross-sectional and longitudinal studies were included. The included studies used a wide variety of statistical analyses (e.g., regression, structural equation modeling, multilevel modeling, etc.). In terms of the sample characteristics, we included studies with school-age children Grades K to 12 and excluded populations of children who were identified as having severe cognitive and/or physical disabilities, gifted children, and

children who were terminally ill. We included both resident and nonresident fathers, two-parent, and single-parent households. Studies that included an aggregate measure of parental involvement in education without distinguishing mother involvement from father involvement, or did not report separate effect sizes for mothers and fathers were excluded. The abstracts of the 3,772 studies originally retrieved from the literature search were examined and only those studies that were empirical, mentioned fathers and/or mothers in the abstract and included at least one type of parental involvement in education and tested the relation with an academic-related outcome were retained, resulting in 122 studies. Of the 122 studies, 14 were eliminated because they did not provide correlations or information sufficient to calculate an estimate of the effect size and the information could not be obtained from the authors, 17 were eliminated because they did not use an achievement outcome, 11 were eliminated because they did not include a parental involvement predictor that fit with our operational definition, 10 were not empirical, 15 did not include a separate mother and/or father effect size, and three were based on populations outside of our criteria of inclusion (i.e., ill children or infants). This resulted in 52 studies.

The most serious threats to validity were posed by the variability in the operational definitions of parental involvement in education, as well as the representativeness of the population of parents, especially for fathers because it is likely that only certain types of fathers will respond and participate in research studies (i.e., highly involved fathers or fathers in two-parent families). Other threats concerned the representativeness of the settings within which the studies were conducted and that a large proportion of the studies were cross-sectional and did not examine the directionality of the association between parental involvement in education and achievement. These issues have been raised by Cooper (2010), and were examined across the studies as indicators of quality. We did not exclude any studies based on these criteria, but classified studies retrieved based on these indicators and examined whether the effect sizes seemed to differ systematically depending on these criteria.²

Information Extracted

A coding scheme was developed based on previous meta-analytic studies on parental involvement (e.g., Hill & Tyson, 2009; Jeynes, 2005, 2007) and Cooper's (2010) recommendations. Each document was coded by two coders: The first author and a graduate student in human development. Initial agreement levels were 94.5% for parental involvement ($\kappa = .93$) and 93.3% for academic outcomes ($\kappa = .90$). Agreement levels for other codes (e.g., ethnicity, gender) were 100%. Coding discrepancies were dis-

² We conducted multiple moderator analyses based on the criteria described, but did not find any systematic patterns. Studies that assessed parental involvement in accordance with prevailing theories did not differ from studies that did not, $Q_b(1) = .008, ns$; studies that were limited to a single setting/location were not significantly different from those studies that were more representative, $Q_b(1) = .35, ns$. We also examined studies that included a single ethnicity versus those that did not limit their population to a single ethnicity, $Q_b(1) = .29, ns$, or those that were limited to single families versus not, $Q_b(1) = 1.05, ns$, and did not find any significant differences, although those studies with single parents had a smaller effect size than in other families, $r(5) = .09$ versus $r(44) = .14$.

cussed and resolved to reach a 100% agreement between the two coders. The second author reviewed all codes and participated in discussions and in resolving disagreements when a consensus could not be reached. Coding the studies independently twice and resolving disagreements by discussing until reaching consensus and involving a third coder to resolve the discrepancy is an acceptable and recommended way to ensure high reliability (Rosenthal, 1991). Coded variables retained information about the type of report, the study setting, participant and sample characteristics, the research design, information about the parental involvement measures, the achievement outcome variable, and the effect size (see Table 1).

Effect Size Estimation

Information needed to calculate an effect size for the relation between parental involvement in education and children's achievement was coded, as well as the direction and the significance of the coefficient. In most cases, correlations and sample sizes were provided. However, in eight cases, other types of measures were

provided, such as frequency tables or two-way analysis of variable tables. In these cases, information was pulled from these studies to calculate corresponding r indexes based on formulas provided by Lipsey and Wilson (2001).

Data Integration and Meta-Analytic Method

First, we conducted statistical integration of correlational studies that reported an effect size of the relation between parental involvement in education and children's achievement using the Comprehensive Meta-Analysis software (CMA; Version 2.0). Separate effect sizes were calculated for the relation between parental involvement and children's achievement for mothers and fathers. The r index weighted by the inverse of its variance was used because it is the most commonly used index for correlational studies (as opposed to experimental studies) and permits us to contextualize this meta-analysis and compare the findings with other studies of parental involvement in education. A random-effects model was used because most studies were naturalistic and there was considerable variation in the design and context of the

Table 1

List of Information Retrieved From Studies

Report characteristics

1. Author-date
2. Type of report (journal article, book or book chapter, technical report, conference presentation, dissertation, etc.)
3. Source of reference or the method by which the report was retrieved
4. Source of funding provided for the report (federal funding or private funding), whether the study used a public-access national data set or an original data set collected for the purpose of the specific study

Study settings

1. Country and state where the study was conducted
2. Type of community (urban, suburban, rural)
3. Setting in which the study was conducted (schools, hospitals or clinics, home, or religious settings)
4. Type of school for those studies conducted in schools (public or private)

Participant and sample characteristics

1. Information about the family structure (whether the families were mostly two-parent or single-parent families, whether fathers were biological fathers)
2. Family size of the samples
3. Mothers' and fathers' age
4. Children's age
5. Grade level of the child
6. Socioeconomic status of the families
7. Racial and ethnic composition of the samples
8. Gender of the child
9. Minority status of the sample (depending on the context of the study)

Research design

1. Naturalistic or experimental, cross-sectional or longitudinal
2. Specific modeling technique that was used in the study.

Parental involvement measures

1. Type of involvement (different types of involvement that are identical to those used in a previous meta-analysis on parental involvement; Hill & Tyson, 2009)
2. Number of items included in the predictor (if it is a scale variable)
3. Information on the specific scale used and whether it had been validated in previous studies
4. Source of report (self-reports, child reports, teacher reports, or spouse's report)

Outcome measures

1. Type of outcomes (standardized achievement test, teacher rating scales, class grades, GPA, academic competence/performance—self-rated, teacher-rated, or rated by parents, educational attainment)
2. Subject of the outcome (math, language, reading, social sciences, sciences, writing, etc.)
3. When the outcome was collected in longitudinal studies
4. Reliability of the outcome measure

Effect size measures

1. Effect size estimate
2. Direction of the effect
3. Significance
4. Information on covariates

studies, therefore the studies are unlikely to be functionally equivalent. By fitting a random-effects model, we were able to extrapolate from this population and generalize to a range of other possible studies.

A shifting unit of analysis was used so that only one single effect size reported per study would be included in each analysis (Cooper, 2010). When multiple effect sizes were reported for different types of parental involvement from a single study, they were averaged into a single effect size when looking at the overall relation between parental involvement in education and children's achievement. However, for the moderator analyses by type of parental involvement were conducted, effect sizes representing each type of involvement were counted separately. Moreover, when several types of outcomes were reported in a single study, they were coded separately but averaged in the final analysis. Last, when several articles reported the relations between the same variables from the same sample (e.g., based on the same public access dataset), information was coded across those articles and they were counted as one single study to avoid violating the independence of assumptions.

For follow-up moderator analyses, we first estimated the overall effect size for fathers and mothers to determine whether they were significantly different from zero, then examined the Q statistic (Hedges & Olkin, 1985) and I^2 index (Higgins & Thompson, 2002) to determine the heterogeneity of the distributions of the effect sizes. The Q statistic tests whether the observed variance in effect sizes is significantly different from that expected by sampling error alone. The I^2 is similar to an intraclass correlation and represents the ratio of true heterogeneity (or variability in effect sizes due to between-studies variance) to total variance across the observed effect estimates.

Next, we tested whether the mean effect size for fathers was significantly different from that of mothers using the $Q_{between}$ (Q_b) statistic (which gives the same results as conducting a Z test or a Q test based on analysis of variance), as described in Borenstein, Hedges, Higgins, and Rothstein (2009). According to common meta-analytic practices (Cooper, 2010), moderator analyses by type of involvement were preplanned based on theoretical reasons, whereas our moderator analyses by child grade level, ethnicity, and gender were exploratory and took into account excess heterogeneity. We established a cut level of four studies per category for the moderator analyses to ensure representativeness of the field. All moderator analyses were conducted separately for the sample of studies that reported an effect size for fathers, followed by those that reported on mothers. Then, mothers' and fathers' effect sizes were compared with each other for each category of all moderators once again using the Q_b statistic. For subgroup analyses, random-effects model within subgroups and fixed-effects model across subgroups was used, also known as "mixed-effects" model (Borenstein et al., 2009). This model was used because this meta-analysis focused on assessing the differences among subgroups, whereas there are many factors that can account for variability in effect sizes between studies. For when mothers and fathers were treated as subgroups in comparisons, it was not assumed that the true between-studies variance was the same for mothers and fathers. As a result, we did not assume a common "among-study" variance component across subgroups and within-group estimates of tau-squared were not pooled.

In an attempt to better explain *whether* and *why* fathers and mothers might differ, we additionally conducted follow-up analyses synthesizing and comparing the mean levels of involvement for fathers and mothers and across the different types of involvement for 26 of the studies that reported enough information to compute the Hedge's g statistics (Borenstein et al., 2009; Hedges & Olkin, 1985). We first computed an effect size for the overall mother-father difference in involvement and examined the Q statistic and I^2 index of heterogeneity before conducting moderator analyses by type of involvement using the Q_b statistic and a "mixed-effects" model.

Results

Parental Involvement and Student Achievement for Mothers and Fathers

Overall effect sizes for mothers and fathers. Some studies included only fathers ($n = 5$) or only mothers ($n = 18$), and others included both parents ($n = 29$).³ The relation between parental involvement in education and achievement might differ in studies with both parents versus studies with only one parent because they may be likely to include two-parent families rather than one-parent families, with nested influences of mother and father involvement on the same child (see McWayne, Campos, & Owsianik, 2008). In two-parent families, mother involvement is likely to be correlated with father involvement because members of the same family influence each other, and are focused on the same child (e.g., Copeland & White, 1991). We tested whether there were differences in effects sizes in studies including both parents versus in studies including only one parent and found no significant differences for fathers, $Q_b(1) = .04$, *ns*, or mothers, $Q_b(1) = .23$, *ns*. Therefore, we conducted the following analyses synthesizing across studies that reported only mother, only father and both mother and father educational involvement.

Overall, there was a positive relation between parental involvement in education and achievement for both fathers and mothers (see the online supplemental material for Appendix 1A and 1B).⁴ The weighted average correlation between father involvement in education and child achievement was .14 (95% confidence interval [CI] [.10, .18]), whereas it was .15 (95% CI [.11, .18]) for mothers. The null hypothesis, that the relation between involvement and achievement is zero, can be rejected in both cases, because the CI does not include zero. Based on the significant Q statistic for both fathers, $Q(32) = 343.37$, $p < .001$; $I^2 = 90.68$, and mothers, $Q(46) = 518.91$, $p < .001$; $I^2 = 91.14$, we rejected the null hypothesis that the variance in effect sizes was produced by sampling error alone and concluded that there were moderating variables present. Although the overall effect size for fathers was smaller than mothers by .01, the strength of the relation between involvement and achievement was not significantly different be-

³ Studies including both parents all drew from the same family.

⁴ Cross-sectional and longitudinal studies are presented separately in the online supplemental material (see Appendices 1A and 1B, respectively, online) but are included together in the main analyses.

tween fathers and mothers under the random-effects models, $Q_b(1) = .10, ns.$ ⁵

Publication bias. To address potential publication bias, the “trim-and-fill” method was used (Duval & Tweedie, 2000) in CMA at the study-level aggregating across mothers and fathers ($n = 52$). The trim-and-fill method tests the distribution of the effect sizes provided by the studies included to the predicted distribution if the studies were symmetrically distributed around a true mean. Missing data can be due to a search limitation or a publication bias in favor of statistical significance, making the distribution asymmetric. To remedy this problem, “missing” studies are estimated by dropping outlier studies, recalculating the mean, and imputing values after returning the outliers based on this mean to improve the symmetry of the distribution. Under the random-effects model, 10 effect sizes were imputed to the right of the figure. These imputed studies actually showed a positive correlation between involvement and achievement, alleviating concerns about studies that could be missing from the left (i.e., negative correlations that would weaken the positive relation found). Follow-up analyses imputing the studies separately by parent gender revealed similar patterns, as shown in the figures in the online supplemental material.

Longitudinal studies. We conducted a moderator analysis by whether the study was cross-sectional or longitudinal to further investigate the robustness of the relation between involvement and achievement over time. Overall, the average weighted correlation for longitudinal studies (achievement outcome collected at least one year after the parental involvement predictor) was higher at .24 (95% CI [.16, .31]) than for cross-sectional studies at .13 (95% CI [.10, .16]), and this difference was significant, $Q_b(1) = 6.72, p < .05$. This provides additional evidence that parental involvement is likely to positively influence achievement and that this relation is robust over time.

Differences Across Various Types of Parental Involvement

Types of parental educational involvement. Most studies reported effects sizes for one or several types of involvement that could be categorized into school involvement, home involvement, or academic socialization (see Table 2), except for 12 studies (10 including both fathers and mothers; two, only mothers) that only reported a general type of involvement, and were excluded from the moderator analyses. Overall, the strength of the relation between involvement and achievement varied by type of involvement for both fathers and mothers. For fathers, the weighted correlation for home involvement was nonsignificant and the smallest ($r = .07$), followed by school involvement ($r = .08$), and academic socialization ($r = .23$). It was the same for mothers ($r = .08$ for home involvement; $r = .16$ for school involvement; $r = .21$ for academic socialization). Follow-up pairwise tests revealed that the strength of the relation for academic socialization was higher than that for home involvement for fathers, $Q_b(1) = 8.75, p < .01$, and mothers, $Q_b(1) = 8.03, p < .01$. However, the weighted correlation for school involvement was stronger than that of home involvement for mothers, $Q_b(1) = 6.57, p < .01$, whereas it was not different for fathers. Mother–father comparisons showed that the strength of relation between parental involvement and achievement did not differ across mothers and fathers for home involve-

ment and academic socialization. However, it was higher for mothers compared with fathers on school involvement. These results suggest that one of the core differences between mothers and fathers is that fathers’ involvement at school might not be as positively associated with achievement compared with mothers and also compared with other types of involvement.

Subtypes of home-based involvement. We set out to examine the subtypes of home-based involvement that were identified in the literature distinguishing homework help and intellectual enrichment. The Q_{within} (Q_w) and I^2 for home-based involvement for fathers, $Q_w(15) = 39.15, p < .01; I^2 = 61.68$, and mothers, $Q_w(20) = 127.86, p < .001; I^2 = 84.36$, indicated heterogeneity arising beyond sampling error. For fathers and mothers, the weighted correlation for homework help was nonsignificant, and they were positive for intellectual enrichment and ($r = .07$ for fathers; $r = .14$ for mothers) and for the mixed category ($r = .12$ for fathers; $r = .14$ for mothers). Follow-up pairwise tests showed that the weighted correlation for the mixed category was stronger than homework help for both fathers, $Q_b(1) = 9.09, p < .01$, and mothers, $Q_b(1) = 8.15, p < .01$. For mothers, the mean effect size for homework help was lower than for intellectual enrichment, $Q_b(1) = 9.28, p < .01$. Mother–father comparisons across the subtypes of home-based involvement revealed that they differed on intellectual enrichment, with mothers’ mean effect size being higher than fathers’.

Differences Across Student Grade Level, Ethnicity, and Gender

Grade level. Not all of the studies provided information on the students’ grade level, but when information on age was provided and the range was relatively narrow, grade level could be inferred (e.g., for Flouri, 2006, children under 10 years old could be classified into elementary level). Students were grouped into three grade levels: Elementary (K to Grade 6), secondary (Grades 7 to 8), and high school (9 to 12). Grades that overlapped across these groups were coded as “mixed” and excluded from these analyses ($n = 7$). For fathers, the weighted correlation was lower for elementary school students ($r = .10$) compared with students in secondary school and in high school ($r = .17$ for both). However, these differences were not significant. For mothers, the weighted correlation was lowest for elementary school ($r = .07$), followed by high school ($r = .13$) and the strongest for secondary school ($r = .26$). Pairwise comparisons revealed that for mothers, the effect sizes were significantly different between elementary level and secondary level, $Q_b(1) = 8.1, p < .01$. Mother–father comparisons in mean effect sizes revealed that the strength of the relation between involvement and achievement did not differ for mothers and fathers under the random-effects assumption for elementary, secondary, or high school students.

Ethnicity. Three different ethnicities were included in these analyses: Euro Americans (more than 90% of the sample), African

⁵ We conducted the same moderator test for studies that reported both father and mother involvement and whose effect sizes were nested within the same family (so this controlled for family context), and found identical results: The strength of the relation between involvement and achievement was not significantly different between fathers and mothers under the random-effects models, $Q_b(1) = .36, ns$.

Table 2
 Moderator Analyses of Effect Sizes by Type of Involvement, Child Grade Level, Ethnicity, and Gender

Moderators (<i>k</i>)	<i>r</i> and 95% CI	Homogeneity analyses		Comparisons by moderator	Father–mother comparisons
		<i>Q</i>	<i>I</i> ²	<i>Q_b</i>	<i>Q_b</i>
Type of involvement					
Fathers					
School involvement (14)	.08** [.02, .14]	97.27***	86.64	14.16**	6.00**
Home involvement (16)	.07* [.007, .12]	39.15**	61.68		.27 <i>ns</i>
Academic socialization (9)	.23*** [.16, .30]	206.37***	96.12		.23 <i>ns</i>
Mothers					
School involvement (18)	.16*** [.11, .22]	73.05***	76.73	12.82**	
Home involvement (22)	.08** [.03, .13]	142.87***	85.30		
Academic socialization (19)	.21*** [.16, .25]	194.48***	90.75		
Home involvement					
Fathers					
Homework help (8)	-.02 <i>ns</i> [-.09, .05]	13.95 [†]	49.81	10.31**	.06 <i>ns</i>
Intellectual enrichment (4)	.07* [.001, .13]	1.69	0.001		8.10**
Mixed (6)	.12*** [.07, .16]	11.56	56.76		.42 <i>ns</i>
Mothers					
Homework help (10)	-.05 <i>ns</i> [-.12, .03]	58.71***	84.67	14.53**	
Intellectual enrichment (8)	.14*** [.06, .22]	2.35	0.001		
Mixed (7)	.14*** [.06, .21]	31.47***	80.93		
Grade level					
Fathers					
Elementary K–6 (12)	.10* [.01, .19]	113.58***	90.32	1.46 <i>ns</i>	.05 <i>ns</i>
Secondary 7–8 (9)	.17*** [.08, .27]	151.07***	94.7		1.56 <i>ns</i>
High school 9–12 (5)	.17* [.03, .29]	21.55***	81.44		.19 <i>ns</i>
Mothers					
Elementary K–6 (23)	.07* [.00, .15]	250.69***	91.22	8.59*	
Secondary 7–8 (10)	.26*** [.16, .35]	147.90***	93.92		
High school 9–12 (4)	.13 <i>ns</i> [-.03, .28]	72.24***	95.85		
Ethnicity					
Fathers					
Ethnic majority (White > 90%) (7)	.14* [.03, .24]	47.62***	87.4	.58 <i>ns</i>	.59 <i>ns</i>
Ethnic minority (Af Am, Hispanic) (5)	.08 <i>ns</i> [-.04, .19]	5.64	29.01		3.45 <i>ns</i>
Mothers					
Ethnic majority (7)	.04 <i>ns</i> [-.11, .19]	92.20***	93.49	3.97 [†]	
Ethnic minority (11)	.23*** [.11, .34]	71.67***	86.05		
Ethnicity (minus 2 studies)					
Fathers					
Ethnic majority (5)	.18*** [.09, .28]			2.48 <i>ns</i>	.001 <i>ns</i>
Ethnic minority (5)	.07 <i>ns</i> [-.03, .17]				3.45 <i>ns</i>
Mothers					
Ethnic majority (5)	.18** [.05, .30]			.37 <i>ns</i>	
Ethnic minority (11)	.23*** [.14, .32]				
Child gender					
Fathers					
Boys (11)	.19** [.09, .29]	90.13***	88.91	.13 <i>ns</i>	.03 <i>ns</i>
Girls (9)	.16** [.05, .27]	79.95***	89.99		.07 <i>ns</i>
Mothers					
Boys (12)	.20** [.10, .29]	105.45***	89.57	.76 <i>ns</i>	
Girls (12)	.14* [.04, .24]	141.52***	92.23		

Note. Random effects *Q* values and point estimates are presented. CI = confidence interval; Af Am = African American.

[†] *p* < .10. * *p* < .05. ** *p* < .01. *** *p* < .001.

Americans, and Latino. Several ethnicities (e.g., Korean, Asian, Indian, Arab, or Afrikaan-speaking South Africans) were excluded because they were only represented in one single study. Because of the small cell sizes, we recoded Euro Americans as “ethnic majority” and African Americans and Latino as “ethnic minority” to conduct our moderator analyses. Despite a seemingly large difference among the two groups (*r* = .14 for ethnic majority; *r* = .08 for ethnic minority), these were nonsignificant for fathers. For

mothers, the relation between parental involvement and achievement was marginally higher for the ethnic minority group (*r* = .23) compared with the ethnic majority group (*r* = .04), *Q_b*(1) = 3.97, *p* < .10. Furthermore, there were no differences between fathers and mothers in terms of the strength of the relation between parental involvement and achievement across these groups.

The moderator analyses by ethnicity may be affected by several studies with Euro American samples that found a negative corre-

lation between parental involvement and student achievement because they were dealing with negative subtypes of involvement, such as homework help (i.e., Ginsburg & Bronstein, 1993) or emphasis on achievement (i.e., Delgado-Hachey & Miller, 1993). These analyses were rerun without these two studies. The mean effect size for Euro American (ethnic majority) involvement increased to .18 for both fathers (.18, 95% CI [.09, .28]) and mothers (.18, 95% CI [.05, .30]) and was not significantly different from ethnic minority families.

Child gender. Separate effect sizes by child gender were coded whenever possible. Eleven studies reported separate effect sizes for girls and boys and 2 studies only included boys in their sample and one study only included girls. All other studies reported results on samples of mixed child gender, where the effect size for girls was not distinguishable from that of boys. All weighted correlations for father–boy ($r = .19$), father–girl ($r = .16$), mother–boy ($r = .20$), and mother–girl ($r = .14$) subgroups were positive and significantly different from zero. The moderator tests revealed that the strength of the relation between involvement and achievement did not differ across boys and girls for both fathers and mothers, respectively.⁶

Follow-Up Analyses: Mother–Father Differences in Mean Levels of Involvement

Overall, the weighted mean g index was .53 (95% CI [.36, .70]). The hypothesis that mothers' mean level of involvement is the same as fathers' can, thus, be rejected because the CI does not include zero, and we conclude that mothers' involvement is higher than fathers'. The test of the distribution of g indexes was large and significant, suggesting the presence of moderators, $Q(25) = 3,798.42, p < .001; I^2 = 99.37$.

We next examined the differences across the different levels of the moderators. We were especially interested in knowing whether father involvement was lower than mother involvement for school involvement. The mean differences in involvement was highest for school involvement, $g(8) = .72, 95\% \text{ CI } [.40, .99]$, followed by home-based involvement, $g(10) = .56, 95\% \text{ CI } [.27, .84]$, and weakest for academic socialization, $g(7) = .44, 95\% \text{ CI } [.11, .77]$. However, these differences were not statistically significant, $Q_b(2) = 1.43, ns$. Mothers and fathers are involved at school at similar mean levels. We were not able to test the mean level differences across mothers and fathers across the subtypes of home-based involvement because of small cell sizes within each category.

We also tested for the differences in fathers' and mothers' mean levels of involvement across the different grade levels. The mean mother–father differences in involvement was highest for elementary school, $g(8) = .69, 95\% \text{ CI } [.26, 1.12]$, followed by high school, $g(4) = .33, 95\% \text{ CI } [-.28, .94]$, and weakest for secondary school, $g(7) = .30, 95\% \text{ CI } [-.16, .76]$. However, these differences were not significant, $Q_b(2) = 1.68, ns$. As for ethnic groups, the differences in mean levels of involvement between mothers and fathers was higher for the ethnic minority group, $g(5) = .43, 95\% \text{ CI } [.21, .66]$, than the ethnic majority group, $g(4) = .32, 95\% \text{ CI } [.08, .56]$, but these differences were not significant once again, $Q_b(1) = .45, ns$. Last, we tested for gender and found that the mean differences in mother–father levels of involvement were similar

between girls and boys, $g(9) = .35, 95\% \text{ CI } [.13, .57]$, for boys; $g(8) = .32, 95\% \text{ CI } [.09, .55]$ for girls.

Discussion

There has been a lack of attention given to fathers in the educational literature because they are not perceived to be primarily responsible for their children's education (Griffith & Smith, 2005; Lareau, 2003; Parke, 2002). However, our findings demonstrated that, overall, in spite of the fact that fathers' mean levels of overall involvement are lower than mothers', the relation between fathers' involvement in education and children's achievement is not only positive, but just as strong as mothers' involvement. This might be due to distinct gendered parenting roles that are largely complementary. Whereas mothers tend to be more frequently involved in all aspects of children's educational lives (i.e., homework help, school activities), warmer, and more supportive, fathers are more likely to expose children to the outside world and to use challenging and cognitively stimulating strategies (Levin et al., 1997; Paquette, 2004; Parke, 2002; Rogers et al., 2009). The findings of our study suggest that despite the widespread belief that mothers might be more central to children's education, fathers and mothers are equally involved in their children's education, and future studies on parental involvement should increase efforts to include fathers to better understand the unique contributions of fathers versus mothers.

The effect sizes found in this study for the relation between involvement and achievement for fathers and mothers (.14 and .15) are each significantly different from zero, but not significantly different from each other. They are larger in magnitude than those reported in a meta analysis on nonresident fathers' involvement and achievement of .04 (Adamsons & Johnson, 2013), but they are slightly smaller than the effect sizes found in a previous meta-analysis examining the relation between direct father involvement and children's early learning of .21 (McWayne et al., 2013), or those of parental involvement and achievement without distinguishing fathers from mothers: Hill and Tyson (2009) reported an effect size of .18 and Fan and Chen (2001) reported an effect size of .25. The small average correlations found in our study might be partly due to plausible inadequacies of the measures of father/mother educational involvement that fail to capture the full extent to which fathers influence their children's achievement throughout their schooling years. Most assessments are based on mothers' involvement and may not include the unique ways in which fathers support their children's education. That is, most research is measuring the extent to which fathers are involved in the ways that mothers are. This points to a gap in the literature, whereby a more comprehensive framework of father–mother educational involvement is needed to more fully explain parental involvement in education.

As hypothesized, the relations to achievement were stronger for mothers than for fathers for school-based involvement. Contrary to our initial hypothesis and to previous individual studies (e.g.,

⁶ The characteristics of the outcome (whether the outcome is based on standardized tests, grades, or academic ability) and subject matter (reading, writing, language vs. mathematics and science) were also examined as moderators. We found no significant differences across outcome type or subject matter.

Eccles & Harold, 1996; Nord, 1997), we found that there were no differences in the mean amount of school involvement across mothers and fathers. This suggests that differences across mothers and fathers in the strength of the relations between school-based involvement and achievement are not due to differences in mean levels of involvement. Fathers tend to be involved just as much as mothers in schools, but differences might arise because fathers' involvement have different meanings from mothers' involvement because of distinct gendered parenting roles internalized by fathers and reinforced by significant groups, such as their family and school personnel (Hoover-Dempsey & Sandler, 1997). For example, even when fathers engage in the same types of behaviors as mothers (e.g., a visit to the school or talking with the child's teacher) with the same frequency as mothers, their involvement might be motivated by different reasons: Fathers might tend to visit to address problems encountered by their child whereas mothers visit to gather information (Catsambis, 2001; Eccles & Harold, 1996; Pomerantz, Grolnick, & Price, 2005). Fathers' visits might also be less valued than mothers', translating into weaker relations with child achievement. There have been no systematic studies exploring the subtler nuances of fathers' involvement notably in schools, but such studies could shed light on the reasons for the differences observed.

Contrary to school involvement, the relations between home involvement and academic socialization and achievement did not differ for mothers and fathers, as expected. This might be because although differences might arise in contexts where gendered parenting roles within families are more salient, such as in school settings, the core mechanisms by which parents influence children's education are not gendered (Hoover-Dempsey & Sandler, 1997). As a result, the different types of involvement fathers and mothers engage are likely to operate in the same way and be equally predictive of achievement regardless of parent gender. Indeed, we found that the overall patterns for the strength of the relation between involvement and achievement across the three types of involvement identified were similar for both mothers and fathers: Academic socialization had the strongest positive relation with achievement, and school-based involvement was also positively related to achievement, but less strongly so. The results for home-based involvement were the weakest but still positive for mothers and fathers. These results corroborated the findings of a previous meta-analysis that focused on "parental involvement" without distinguishing between fathers and mothers (Hill & Tyson, 2009).

Academic socialization was the strongest predictor of achievement for school-age children of all grade levels and did not differ for fathers and mothers. This is consistent with prior research and theory (Hill & Tyson, 2009; Jeynes, 2011). Academic socialization is reflective of attitudes and beliefs about the value of education that are more likely to be shaped by factors other than gender, such as educational background or socioeconomic status, and is more central to the parent-child relationship. Parents consistently socialize their children about education at home regardless of their levels of direct involvement (Gniewosz & Noack, 2011). Thus, academic socialization may also less likely be related to gendered parenting roles. Academic socialization taps into both skill and motivation development, by scaffolding students' cognitive abilities while emphasizing the value of education and motivating them

to make future plans in terms of their academic pursuits (Pomerantz et al., 2007).

As for home-based involvement, the weak findings for homework help for fathers and mothers suggested that fathers and mothers might be equally involved in their children's education when they are struggling in school, use parental pressure generating negative affect, or interfere with their children's autonomy (Grolnick, 2003; Patall, Cooper, & Robinson, 2008). The positive association between intellectual enrichment and achievement for both fathers and mothers indicated that providing opportunities for cognitively and intellectually engaging materials and activities are positive for student achievement, and corroborates previous research (Pomerantz et al., 2007). The mean effect size of the relation between intellectual enrichment and achievement was higher for mothers than fathers', suggesting that mothers might be more effective in improving achievement through their engagement in intellectually enriching activities. Compared with fathers, mothers indeed have been found to engage in warmer more supportive parenting styles that tended to be conducive to improved achievement whereas fathers were found to endorse in harsher achievement-oriented strategies that dampened performance (Collins & Russell, 1991; Kim & Fong, 2014; Rogers et al., 2009). Such global parenting styles are important especially in the context of direct interactions with their children during home activities.

When fathers engaged in *only* intellectual enrichment activities at home, this was less strongly associated with achievement compared with providing homework support *in addition to* intellectual enrichment. These findings suggested that fathers who display high levels of home-based involvement overall might influence achievement more positively. Parental homework help might be negatively associated with achievement because parents who only assist with homework might be involved in response to their children's poor performance, whereas parents who not only provide homework help but also engage their children in other intellectually enriching activities are more likely to behave in such way because they value education and make an effort to be actively involved at home with their children, positively influencing their achievement (Patall et al., 2008; Hill & Tyson, 2009).

As for the moderator analyses by students' grade levels, we found mothers' involvement to be more strongly associated with achievement for students in secondary school than elementary school students whereas no differences were found for fathers. At the elementary level, there are greater expectations for involvement at home and at school by teachers and children. However, as children enter middle school, expectations and opportunities for involvement might decline with adolescents' increasing needs for autonomy (Singh et al., 1995). Thus, only those mothers who are equipped to face the challenges of the middle school system (Hill & Chao, 2009), or who believe in the importance of education and who were involved when their children were younger (Epstein & Sanders, 2002) continue to be involved with their children in secondary school. As a result, there is more variability in secondary grades compared with elementary grades in terms of who gets involved or not. However, for fathers, the strength of the association was not different between involvement and achievement at elementary and secondary school levels. This might be because there is less variability in involvement between elementary and secondary school for fathers and their involvement may not adjust to meet the different demands of adolescence and the middle

school context. In the United States, mothers' school involvement was found to decrease whereas fathers' school-based involvement practically remained the same over time in elementary, secondary, and high school (Nord, 1997). But, when mothers remained involved during middle school, their involvement was more strongly related to achievement than involvement during elementary or high school.

As for students' ethnicity, no differences were found in the strength of the association between involvement and achievement across ethnic majority and ethnic minority groups for fathers, whereas the ethnic minority group had a marginally stronger association than the ethnic majority group for mothers. However, these results are inconclusive because the findings might have been confounded with the type of involvement reported by these ethnic groups. These findings corroborated previous meta-analyses on the relation between parental involvement and achievement (Fan & Chen, 2001; Hill & Tyson, 2009; Jeynes, 2005). However, it is difficult to ascertain why some studies find ethnic differences and others do not. Based on a meta-analysis of middle-school aged youth that found ethnic differences in the fixed effects models, but not the random effects models, it was concluded that such ethnic differences might reflect differences in socioeconomic status or other demographic markers confounded with ethnicity (Hill, 2006; Hill & Tyson, 2009). Parental involvement not only has culturally embedded goals and meanings for various ethnic groups (Hill & Craft, 2003) but also varies depending on the family's socioeconomic status (Lareau, 2003). We thus conclude that although no differences in the strength of the relation between involvement and achievement were found across the ethnic groups, this does not mean that parents are involved in similar ways, as their motives and goals might be different depending on their cultural context and economic resources.

Child gender also did not moderate the relation between parental involvement and achievement for mothers or fathers, contrary to our initial hypothesis that fathers' involvement with their sons might be more predictive of their achievement than fathers' involvement with their daughters because of the gender congruence theory (Ruble et al., 2006). Parental educational involvement was equally beneficial for sons and daughters and parents did not differentially engage with their children according to their gender, as shown in a previous meta-analysis on a general parenting, not specific to education (Lytton & Romney, 1991). However, we note that due to the small sample sizes, we might not have been able to detect differences, thereby our moderator analyses by ethnicity or child gender were exploratory.

There were several limitations to this meta-analytic study. First, meta-analyses are limited by the quality and breadth of the existing corpus of research. Although there are a few longitudinal studies providing evidence for the robustness of the relation between parental involvement and achievement over time, this meta-analysis is based mostly on cross-sectional studies. Second, there is a wide variability in the way parental involvement and achievement has been measured across the studies included in this meta-analysis, making it difficult to identify and interpret consistent patterns of associations. No standard parent involvement scale was used systematically and each study used different measures, although certain scales were adapted and used in more than one study (i.e., parental involvement scale by Hoover-Dempsey et al., 2005). There was also heterogeneity in the outcome measures—

grades, GPA, standardized tests, and so forth. Nonetheless, we were able to identify similar patterns in this study compared with previous parental involvement studies as described earlier. Third, the lack of power precluded us from using more sophisticated methods of analyses, such as metaregressions, that could account for shared family context, which would be a fruitful avenue of future investigation. The findings from this meta-analysis point to more specific hypotheses about the role of fathers in family school relationship and thereby sharpen the extant knowledge base. Last, because of the relatively small number of studies available, the number of effect sizes retained for some moderator analyses were small and results should be considered with caution.

In the context of these limitations, this meta-analysis attempted to identify aspects of involvement and processes that are unique to fathers versus mothers. Such approach is critical because neither mothers nor fathers operate in a vacuum and their involvement reflects other aspects of the family system in which the child operates (Parke, 2002). Our findings suggested that parents have equivalent academic impact on children regardless of their gender, and fathers play an important but distinct role from mothers in promoting their children's school success. However, fathers' involvement in school settings might be less strongly associated with children's achievement compared with mothers, especially at elementary school level. This might be because programs or policies targeting parents' educational involvement do not encourage father involvement in school settings (Rane & McBride, 2000). This calls for increasing efforts to include fathers in policies and programs targeting family school relationships. A change in gender norms and expectations regarding fathers' participation in their children's education to maximize students' academic potential can potentially close the gaps observed. Our study encourages future studies to further investigate the distinct roles of fathers and mothers and their influence on children's achievement to better understand the ways in which fathers and mothers can work together to contribute positively to their children's academic development.

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