Psychological Bulletin
2010, Vol. 136, No. 6, 915–942

0033-2909/10/$12.00 DOI: 10.1037/a0020875

Maternal Work Early in the Lives of Children and Its Distal Associations With Achievement and Behavior Problems: A Meta-Analysis

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This meta-analysis of 69 studies (1,483 effect sizes) used random effects models to examine maternal employment during infancy/early childhood in relation to 2 major domains of child functioning: achievement and behavior problems. Analyses of studies that spanned 5 decades indicated that, with a few exceptions, early employment was not significantly associated with later achievement or internalizing/externalizing behaviors. The exceptions were for teacher ratings of achievement and internalizing behaviors: Employment was associated with higher achievement and fewer internalizing behaviors. Substantial heterogeneity among the effect sizes prompted examination of moderators. Sample-level moderator analyses pointed to the importance of socioeconomic and contextual variables, with early employment most beneficial when families were challenged by single parenthood or welfare status. Maternal employment during Years 2 and 3 was associated with higher achievement. Some moderator analyses indicated negative effects of employment for middle-class and 2-parent families and for very early employment (child's first year). Associations also differed depending on whether effect sizes were adjusted for contextual variables. Only 1 study-level moderator (sex of first author) was significant after adjusting for other moderators. The small effect size and primarily nonsignificant results for main effects of early maternal employment should allay concerns about mothers working when children are young. However, negative findings associated with employment during the child's first year are compatible with calls for more generous maternal leave policies. Results highlight the importance of social context for identifying under which conditions and for which subgroups early maternal employment is associated with positive or negative child outcomes.

Keywords: maternal employment, meta-analysis, achievement, problem behaviors

Supplemental materials: http://dx.doi.org/10.1037/a0020875.supp

Since the 1980s, the majority of women with young children have worked outside the home. The public has grown more accepting of mothers' employment in general, with 67% of men and 80% of women agreeing that employed women can be good mothers compared with 48.9% in the late 1970s (Davis, Smith, & Marsden, 1999; Galinsky, Aumann, & Bond, 2008). Furthermore, a majority of Americans now endorse the idea that both husband and wife should contribute to family income (Pew Research Center, 2009). Still controversial, however, is maternal employment when children are infants and toddlers (Brooks-Gunn, Han, & Waldfogel, 2002; Davis et al., 1999; Gottfried, Gottfried, & Bathurst, 2002). The public remains particularly concerned about whether full-time employment is optimal for children, with only 11% endorsing full-time work for mothers with young children (Pew Research Center, 2009).

Empirical studies over several decades have been directed toward examining early maternal employment (employment during the child's first 3 years) in relation to child outcomes including cognitive (e.g., Brooks-Gunn et al., 2002), social relational (e.g., Harrison & Ungerer, 2002), health (Hawkins, Cole, Law, & the Millennium Cohort Study Child Health Group, 2008), and behavioral (e.g., Vander Ven, Cullen, Carrozza, & Wright, 2001) development. Findings from these studies are mixed and more complicated than simple main effects. Research linking early maternal employment to children's later cognitive and behavioral outcomes indicates some positive associations (e.g.,Vandell & Ramanan, 1992) and some negative associations (e.g., Baydar & Brooks-Gunn, 1991; Ruhm, 2004); some studies report both positive and negative findings (depending, e.g., on sample characteristics and timing of maternal work; Harvey, 1999; Waldfogel, Han, & Brooks-Gunn, 2002). Another avenue of research has examined early maternal employment in relation to children's achievement and behavior years later (e.g., Baum, 2003; Baydar & Brooks-Gunn, 1991; Waldfogel et al., 2002). A few studies have found recent but not early employment to be associated with child outcomes (e.g., Baum, 2004); conversely, longitudinal associations have been present in the absence of concurrent ones (i.e., *sleeper effects*; e.g., Bogenschneider & Steinberg, 1994).

Because of the large number of studies and the complex and competing findings, the current meta-analysis takes a contextual approach to resolve conflicting evidence about early maternal employment in relation to two important child outcomes: academic achievement and behavior problems. Academic achievement is

This article was published Online First October 4, 2010.

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broadly defined to include achievement test scores, school grades, intelligence test scores, and teacher ratings of cognitive abilities. Behavioral problems encompass both internalizing (i.e., troubled behaviors, such as anxiety and withdrawal) and externalizing behaviors (i.e., troubling behaviors, such as aggression and conduct disorders).

Research on maternal employment measured at the same time as the child outcome was reviewed recently in a meta-analysis by Goldberg, Prause, Lucas-Thompson, and Himsel (2008). They concluded from their analysis of 68 studies that the overall association between maternal employment and children's achievement, which was the sole child outcome in their analysis, was nonsignificant. However, small, significant effects were found when analyses included social and contextual moderators of the relationship between employment and achievement. For example, associations were more positive for one-parent, mixed one- and two-parent, and racially/ethnically diverse samples than for other samples. Small but negative associations between concurrent maternal employment and children's achievement were found among samples that were primarily White or middle or upper class. Goldberg et al.'s meta-analysis suggested that an analysis of moderators (e.g., identifying for whom and under what conditions maternal employment is important) is the best approach to understanding the association between maternal employment and child outcomes. However, their meta-analysis did not examine moderators of early maternal employment. The current meta-analysis elaborates the importance of early maternal employment and adds behavioral measures to the set of child outcomes.

Developmental and economic theories imply that maternal employment early in children's lives may influence children differently than employment later in childhood. From the human development literature, Bronfenbrenner's (1986) ecological model compels researchers to examine settings that do not directly involve children but nonetheless influence child functioning. The parental workplace is one such setting. Mechanisms for understanding how early maternal employment might affect children are offered by attachment theory and the construct of critical/sensitive periods; these literatures also indicate important moderators of the association between maternal employment and child development.

The close ties that infants form with their caregivers provide safety and security, particularly in times of stress (Bowlby, 1969/1982). Secure attachments, wherein infants can count reliably on their caregivers to protect and care for them, are promoted in part by sensitivity to infant signals as well as by responsive care (Ainsworth, Blehar, Waters, & Wall, 1978; De Wolff & van Ijzendoorn, 1997). Whereas being employed does not render mothers more or less sensitive or responsive (Huston & Aronson, 2005; Symons, 1998; Wille, 1992), regular separations from the mother might impede the ability of the infant to form a secure representation of the mother (Belsky, 1988). Secure attachment relationships are consequential for later cognitive development and behavior (see a review by Thompson, 2008) and provide a possible mechanism through which early maternal employment could affect later development in multiple domains. In terms of timing, early maternal employment in particular may be likely to disrupt the formation of a secure attachment (e.g., Belsky, 1999; Jaeger & Weinraub, 1990). However, some have argued that a later return to work, one that occurs after the establishment of the attachment relationship, is more damaging than a return while the attachment relationship is developing (e.g., Chase-Lansdale & Owen, 1987). The varied perspectives from the attachment literature point to the need to examine the timing of maternal employment in relation to children's development.

An underlying assumption of research directed toward the study of maternal employment during the early years of life is that there may be critical or sensitive periods early in the life span for brain development (Shonkoff & Phillips, 2000) when children are more vulnerable to characteristics and changes in their environment (Rutter, 1979), especially those that prompt patterns of behavior that are resistant to later change (Bronfenbrenner, 1986). In addition, child outcomes, such as achievement, that are cumulative and build on previous knowledge and experience may be particularly vulnerable to early environmental influences (Rutter, 1979). Moreover, some children, under some conditions, appear more or less vulnerable to early environmental influences during the critical periods of infancy and childhood (Rutter, 1979). These theoretical positions suggest that children's achievement and behavior may be more adversely affected by employment in infancy and toddlerhood than by employment during school-age years and adolescence.

The effects of prolonged separation from the mother speak to direct paths of influence from mothers' work to child outcomes. Maternal employment's association with child outcomes also may be indirect, operating through parenting to influence child functioning. For example, one study found that maternal employment affects maternal guidance and, in turn, toddler compliance (Crockenberg & Litman, 1991). Early and concurrent maternal employment have each been found to be related to the extent of maternal supervision (Vander Ven et al., 2001). Parenting also may be affected by negative or positive spillover from work; for example, low-income mothers who experienced stressful days at work tended to withdraw from interactions with their preschool-age children when they returned home (Repetti & Wood, 1997). It is not always the case that employed mothers, because of absence from the home or spillover from work to home, engage in less of these valued parenting behaviors. Employed mothers may go to great lengths to compensate for their absence (Hoffman, 1979), especially those mothers who are employed full-time (Crockenberg & Litman, 1991).

When mothers are employed outside the home, a typical corollary of their employment is nonmaternal care, especially when children are very young. The overlap between employment and child care is greatest in the first year but lessens as children age (e.g., Belsky, 2001); however, early maternal employment can initiate a cascade of early-starting and long-lasting care by others (Belsky, 2001). On the one hand, reviews indicate that quality child care experiences are associated with higher cognitive development and more social competence (e.g., Peisner-Feinberg et al., 2001). On the other hand, more hours in center care between ages 3 and 54 months is predictive of more externalizing behavior at 54 months (NICHD Early Child Care Research Network, 2004). A recent meta-analysis of center child care and early education programs found stronger effects between quality of care measures and cognitive compared with social outcomes and for younger compared with older children (Burchinal, Kainz, & Cai, in press).

The bottom line about maternal employment and child care seems to be complex associations based on both quantity and quality. For example, more time in nonmaternal care and poorer

quality child care predicted less sensitive parenting (NICHD Early Child Care Research Network, 1997), and through its impact on parenting, the quantity of alternate care adversely affected children's behavior (NICHD Early Child Care Research Network, 1997). In the most recent publication from this research group, based on the same economically and geographically diverse sample of over 1,300 children, both quality and quantity of early child care were predictive of achievement and behavioral outcomes years later. Children who attended higher quality child care programs scored better on cognitive and achievement measures at age 15 and displayed fewer externalizing behaviors, such as acting out in class. Quantity, too, mattered: More hours of nonrelative care during the first 4 1/2 years of life were predictive of greater risk taking and impulsive behaviors at age 15 (Vandell et al., 2010). Effects of child care were small (e.g., $d = .09$ for quality of care and achievement) but long lasting.

Another perspective on maternal care and substitute care is offered by a household economics framework in which child care is the market service that is substituted for parental care, a nonmarket commodity. When there is an inequity between the sources of care, undesirable child outcomes may result (Greenstein, 1993). This economic framework was applied by Greenstein (1993) to explain negative associations between continuous early maternal employment and behavior problems for children from very supportive home environments. When their mothers were continuously employed during their early years, these children may have suffered relative deprivation or *lost resources* (NICHD Early Child Care Research Network, 2003) in the sense that the alternate care may not have been as emotionally supportive as full-time maternal care would have been.

When maternal employment is the focus of research and public commentary, it is common to focus on negative consequences of maternal work for children (Greenberger, Goldberg, Crawford, & Granger, 1988). It is important to acknowledge that theory and research also support beneficial associations with maternal work. From a psychological perspective, working mothers provide a role model for competence and success, among other attributes, which particularly benefits daughters (Hoffman, 1989; Wolfer & Moen, 1996). Mothers' parenting, too, may be affected in positive ways, such as setting independence as a goal for their daughters (Hoffman & Youngblade, 1999). From an economic perspective, paid employment brings resources into the home and enables consumption of goods and services. One means, then, by which maternal employment could benefit young children is by providing families with the income to afford high-quality child care and goods and service that enhance children's development (Greenstein, 1993).

Potential Moderators of Effect

Studies that have examined maternal employment in relation to child outcomes often differ in the composition of their samples, study designs, and choice of outcome measure. They also differ in the complexity of their models in terms of control variables and operationalization of employment. To address this diversity, we adopted a contextual approach that includes potential sample- and study-level moderators of the association between early maternal work and children's later achievement and behavior. Although the findings vary across and within studies, results of individual studies indicate that sample characteristics often influence associations between early maternal employment and children's later development. Examination of the moderating role of sample characteristics enables us to detect subgroups of children whose later achievement and behavior is differentially related to earlier maternal employment. In more recent years, longitudinal designs have become more common, and researchers have considered the importance of controlling for contextual variables and testing moderators. These methodological changes raise the possibility that study characteristics, such as publication year and research design, may moderate the association of interest. In the current meta-analysis, both sample-level and study-level moderators were examined.

Sample Characteristics

Over the decades, there have been theoretical and empirical indications that socioeconomic status (SES), family structure, race/ethnicity, child age, child sex, and the intensity of the employment influence whether or how early employment is associated with later achievement. However, the findings are not always consistent, and the precise role that these socioeconomic and contextual variables play has not yet been made clear.

For instance, children from middle- and upper-middle-class families appear to be more likely to suffer adverse effects of early maternal employment (Bogenschneider & Steinberg, 1994; Desai, Chase-Lansdale, & Michael, 1989; Gregg, Washbrook, Propper, & Burgess, 2005), consistent with the notion of diminished (or lost) resources from alternate care compared with what mothers would have provided (Desai et al., 1989; NICHD Early Child Care Research Network, 2003). In families with higher SES, maternal employment may not be a financial necessity; therefore, the benefits of a mother's work may not outweigh the negative effects of decreased maternal attention and supervision and the risk of poor quality child care arrangements. For children from welfare-eligible and working-class families, the benefits that maternal employment makes possible, such as added financial security, reduced family stress, and increased learning opportunities, may be *compensatory* (Desai et al., 1989) and operate to buffer children from negative effects due to maternal absence. Therefore, employment may be most likely to accrue compensatory benefits for families with lower incomes.

Recent policy changes have altered the landscape of employment for the poorest families and allow researchers to more easily distinguish between lower SES and welfare families. The Family Support Act of 1988 and the enactment of the Personal Responsibility and Work Opportunity Act of 1996 were intended to reform welfare by moving welfare-dependent mothers into the paid labor force. Mandated work may differ in important ways (hours, wages, stability, complexity) from jobs that are sought voluntarily. Initial assumptions were that the increased income and opportunity for mothers to serve as role models would bring benefits of maternal work into children's lives. Soon, however, concerns arose that mandated maternal employment would increase parental stress, impair parenting abilities, and leave children vulnerable to being unsupervised or placed in low-quality or unsafe care arrangements (Morris, Huston, Duncan, Crosby, & Bos, 2001). Empirical data are mixed. Results from a large longitudinal study of low-income families indicate that mothers' transitions from welfare to work are not associated with negative outcomes for preschoolers or young adolescents (Chase-Lansdale

et al., 2003). However, another perspective is offered by the Children's Defense Fund (2002), whose report pointed out that when welfare-to-work programs result in reduced family income, children are more likely to suffer adverse effects, such as poor mental and physical health, school problems, behavior problems, and a greater likelihood of being removed from their mother's care. Also critical is the provision of services directly to children to prevent negative spillover effects of mandatory welfare-to-work programs (Hamilton, 2000). When examining associations between early maternal employment and child outcomes, it is important to consider whether study participants were receiving welfare or were part of mandated welfare-to-work employment.

The results regarding the roles of family structure and race/ethnicity are similarly equivocal. The negative association between early maternal work and children's achievement is often larger in two-parent compared with one-parent families (Brooks-Gunn et al., 2002; Ruhm, 2004); other studies suggest a positive association only for children of single parents (Harvey, 1999). Explanations of this difference again center on the added financial security and lessened family stress from maternal work in sole-provider families. However, other studies suggest that family structure leads to no differences in the association between employment and achievement (Gregg et al., 2005). In terms of race/ethnicity, expectations have been that Black children would demonstrate more positive associations between early maternal work and child achievement because of the more egalitarian gender roles and the long-term normative status of maternal work in these families (McLoyd, 1993; U.S. Census Bureau, 2002). Indeed, some studies have found more negative associations with early maternal employment for White than for Black (Han, Waldfogel, & Brooks-Gunn, 2001; Waldfogel et al., 2002) or Hispanic families (Waldfogel et al., 2002). However, other researchers have found that this pattern is reversed depending on the outcome under investigation (Ruhm, 2004).

The nature of associations between early maternal employment and children's later development may also depend on child characteristics, such as age and sex. Research most consistently finds a negative association between early maternal employment and achievement in early childhood (Baum, 2003; Blau & Grossberg, 1992). Once children are older, the influence of schools and peers (Baum, 2004) and the quality of out-of-school experiences (Coley, Morris, & Hernandez, 2004) may be more consequential than family influences. Although some studies indicate that the effect of early maternal employment on achievement continues into later childhood and adolescence (Bogenschneider & Steinberg, 1994; Harvey, 1999), other studies have found that early maternal work does not trigger a set of events that negatively affects academic achievement beyond early childhood (Baum, 2004; Waldfogel et al., 2002). Therefore, it is unclear how long the effects of early employment persist.

In terms of child sex, maternal employment is expected to be more positive for daughters than sons, because girls may benefit from role modeling and from potential correlates of maternal employment, such as greater independence training, more egalitarian parental gender roles, and increased paternal involvement (Hoffman, 1979, 1980). Maternal employment may be more detrimental for boys, whose independence-seeking behaviors may increase their need for supervision and guidance (Beyer, 1995; Hoffman, 1984). Although research often supports these expected sex differences (e.g., Bogenschneider & Steinberg, 1994), they are not always evident (e.g., Baum, 2004) and sometimes appear in the opposite direction (Ruhm, 2004; Waldfogel et al., 2002).

The extent of early maternal employment also may influence the strength of the association between work and children's achievement and problem behavior. In particular, some hypothesize that working longer hours may be more damaging for children, especially early in infancy (e.g., Baum, 2003). Most commonly, the direction of effects is larger and more negative for full- compared with part-time employment or more intense compared with less intense work (Baum, 2003; Baydar & Brooks-Gunn, 1991; Gregg et al., 2005; Ruhm, 2004). In some studies, subgroup analyses reveal negative associations with very early employment for one subgroup only, such as White children (e.g., Han et al., 2001). In contrast, maternal employment when children are a bit older (ages 2–3 years) tends to be associated with positive cognitive and behavioral outcomes (e.g., Waldfogel et al., 2002).

The inclusion of and adjustment for control variables also were analyzed, as research indicates that the association between maternal employment and children's development can be reduced (Baum, 2004; Heyns & Catsambis, 1986; Waldfogel et al., 2002), change direction and/or magnitude (Baydar & Brooks-Gunn, 1991), or remain unchanged (Vandell & Ramanan, 1992) after adjustment for other variables. As reviewed earlier, the type, quality, and stability of alternative child care arrangements have been identified as important factors to consider. Not all studies of maternal employment and child outcomes included a measure of alternate care arrangements, and those that did were most likely to focus on type of care. Thus, in this meta-analysis, adjustment for type of child care arrangement was examined as a moderator.

We also tested the importance of controlling for employment concurrent with the achievement and behavioral assessments; this commonly included work hours, employment status, or income. Also important to consider is whether mothers' employment provided the sole source of income or whether their partners were employed. Less frequently examined was fathers' employment in relation to child outcome, but there were notable exceptions (e.g., Parcel & Menaghan, 1994). In the absence of data on fathers and children, some researchers adjusted for the effects of fathers' income, occupation, or work conditions when examining maternal employment and child functioning (e.g., Aughinbaugh & Gittleman, 2004; Baum, 2003; Vander Ven et al., 2001). When available, we included controls for paternal employment characteristics to examine the role of employment in the family more broadly.

Another particularly relevant study characteristic appears to be the time at which early employment is measured. Compared with women who return to work later, women who return to work soon after their child is born tend to be more educated, to have higher income, and to be more likely to be married (Brooks-Gunn et al., 2002; Hill, Waldfogel, Brooks-Gunn, & Han, 2005). Several studies have found that maternal employment is detrimental only during the first year and that work in the second, third, or fourth years of life can be beneficial for cognitive and/or behavioral development (Baydar & Brooks-Gunn, 1991; Blau & Grossberg, 1992; Desai et al., 1989; Hill et al., 2005; Waldfogel et al., 2002). However, other studies have found that it is only full-time work during the first year that is harmful for children (e.g., Gregg et al., 2005). Therefore, the point in infancy and early childhood at which maternal employment was assessed is examined as a potential

moderator variable of the association between employment and children's later achievement and behavior.

Studies also varied in the source of information about the child, particularly for reports of behavior problems. Older children can report on their own grades or psychosocial behavior problems (e.g., Aughinbaugh & Gittleman, 2004; Lerner & Galambos, 1988); often parents or teachers (e.g., Auerbach, Lerner, Barasch, & Palti, 1992; Borge & Melhuish, 1995; Nomaguchi, 2006; Youngblade, 2003) are the source of information about younger children, and sometimes observer ratings of behavior are used (e.g., Barglow, Contreras, Kavesh, & Vaughn, 1998; Crockenberg & Littman, 1991). Therefore, we examined the potential moderating role of the source of information of behavior problems. Source of information was assessed indirectly for achievement outcomes; formal achievement and IQ outcomes were based on standardized tests, whereas teachers were the source for teacher-reported data about children.

Study Characteristics

Due to the changes in study design and methodology over the period of the meta-analysis, study characteristics were examined as potential moderators. Because the included studies were published across five decades, during which maternal employment has become more normative, year of publication (a proxy for time of data collection) was tested as a moderator. In addition, sex of first author was tested as a moderator because of the possibility of bias from researchers' beliefs (Eagly, 1986). The potential moderating role of study quality also was examined. Study quality was operationalized as the source of the sample, type of research design, and quality of the publication outlet (i.e., journal impact score).

A considerable number of the included studies utilized the large, diverse sample of the National Longitudinal Survey of Youth (NLSY). The NLSY is a nationally representative study of individuals born in the United States between January 1, 1957, and December 31, 1964. A supplemental sample intentionally oversampled Blacks, Hispanics, and economically disadvantaged Whites. All children born to female respondents to the NLSY have been followed to create the NLSY child sample. Waves of NLSY data were collected between 1979 and 1994. Published studies of the NLSY child sample have varied in their selected subsets of children and families and also have varied in their measures of maternal employment, children's achievement, behavior problems, and control variables. Because approximately one third of the studies in the meta-analysis relied on NLSY data, NLSY status was included as a moderator in the analyses.

The primary aim of this meta-analysis, then, is to evaluate the direction and strength of the association between early maternal employment and children's later achievement and problem behaviors. An auxiliary goal, implemented through examination of both sample- and study-level moderators, is to determine under what conditions and for which subgroups children's achievement and behavior are enhanced or compromised by early maternal employment. The overarching intention is for this systematic, quantitative synthesis to resolve some of the lingering ambiguities in the extant literature.

Method

Literature Searches

Two methods were used to locate studies for the meta-analysis. First, a computerized database search from 1960 to March 2010 was conducted (PsycINFO, Social Sciences Index, ERIC, and Dissertation Abstracts International/Proquest). The year 1960 was chosen as the starting point for the searches to be coincident with the beginning of active empirical inquiry into the relation between maternal employment and children's development. The keywords that were entered separately and in combination were *maternal, mother*(s), *parental, employment, work, labor, child care, early, infancy, children*('s), *boy*(s), *girl*(s), *achievement, academic, cognitive, cognition, school, behavior problems, adjustment, external*(*izing*), *internal*(*izing*), *defiance, and compliance.* Second, the reference lists of retrieved articles, review articles and chapters, and proceedings of national conferences were searched manually. When available, published, peer-reviewed versions of dissertations, working papers, and book chapters were used. Additional searches for unpublished studies were not conducted. A representative sample of such studies would be nearly impossible to find because the time span for the meta-analysis was approximately 50 years; it would have been particularly difficult to locate unpublished studies from the earlier years.

Inclusion and Exclusion Criteria

The first selection criterion concerned the operationalization of early maternal employment. Studies were included only if they included a measure of employment when children were 0 through 3 years of age; employment that extended through Year 6 was included only if it was an aggregate measure of employment that also included employment in the range of 0 through 3 years. Studies were included if maternal employment was defined in terms of status (e.g., employed, not employed; full-time, part-time) or number of weekly work hours. Studies were excluded if work characteristics or maternal behavior, rather than status or hours, was the index of maternal employment. Also excluded were studies that did not specify a clear reference group for maternal employment. However, studies that were not designed explicitly to examine maternal employment were retained if data on the association between maternal employment status or hours and children's achievement could be extracted. Child care was seen as a likely consequence of maternal employment but was not synonymous with it. Therefore, studies that provided effect sizes only for the association between child care and children's outcomes were not included. Another inclusionary criterion was that studies had to provide enough information to calculate a measure of effect size. When this information was missing, authors were contacted; studies were excluded when authors did not respond to our queries.

The second selection criterion concerned the operationalization of the achievement and behavior problems outcomes. Studies were included if the achievement outcome was children's performance on formal tests of academic or intellectual development, school grades, or teacher ratings of cognitive/academic competence. Studies were included if the behavioral outcome was children's externalizing problems, internalizing problems, or overall behavior problems. Studies were excluded if the achievement outcome

under investigation was task motivation or parental perceptions of child achievement other than grades; studies were excluded if the behavioral outcome under investigation was positive behaviors, such as prosocial behaviors.

We identified 216 studies from the literature search. Because our retrieval words did not always specify *early maternal employment*, many of these studies did not focus on early employment. Therefore, about half of the 141 excluded studies were not included because they did not present effects of early employment ($k = 78$). Other articles and dissertations were excluded because they did not meet the inclusionary criteria for the operationalization of maternal employment ($k = 22$), did not meet inclusionary criteria for the operationalization of child outcomes ($k = 14$), did not present maternal employment and child outcomes in relation to each other ($k = 11$), were not empirical but instead were review pieces ($k = 7$), were published in another peer-reviewed forum that was used instead ($k = 8$), were not available ($k = 5$), or did not present effect sizes ($k = 2$).

Therefore, 69 studies met the criteria for inclusion in the meta-analysis (20 studies presented achievement outcomes only, 23 presented behavioral outcomes only, and 26 presented both achievement and behavioral outcomes). The aggregate number of children was 128,738 children with sample sizes in the individual studies ranging from 28 to 38,000 ($Mdn = 639.5$).

Coding of Study Variables

Studies were initially identified and coded by the first author. For reliability, the third author independently coded each of the articles. Discrepancies were resolved by consensus among all three authors. Percentage of agreement between the initial and subsequent coding exceeded 90%.

Maternal employment. Maternal employment was represented as a categorical variable when employment status was provided in the original article (e.g., the mother was employed full-time, typically defined as working 30 hr or more per week; was employed part-time, typically defined as working up to 30 hr per week; held any paid employment, with extent of employment not specified; or was not employed). Several studies used the categories of full- and part-time employment but did not define how these categories corresponded to the number of weekly working hours. In these instances, the authors' categorization was accepted. If the original article represented employment as a continuous hours-of-employment variable that included zero hours, employment status was represented as a continuous variable.

Children's achievement. Four categories of child achievement outcomes were included in the meta-analysis: (a) formal tests of achievement, (b) academic grades, (c) formal intelligence tests, and (d) teacher ratings of cognitive/academic abilities. Formal achievement tests included overall measures of achievement (e.g., Comprehensive Test of Basic Skills, 1996), as well as subject-specific achievement tests (e.g., Reading and Math subtests of the Peabody Individual Achievement Test; Dunn & Markwardt, 1970). Academic grades were coded for overall grade point average or subject-specific grades (e.g., math, science). Formal assessments of intellectual aptitude included overall tests of intelligence and IQ (e.g., Stanford-Binet Intelligence Scale; Thorndike, Hagen, & Sattler, 1986), as well as tests of only one domain of intellectual functioning (e.g., Peabody Picture Vocabulary Test; Dunn & Dunn, 1981). Teacher ratings of cognitive abilities (e.g., ratings of cognitive/academic skills and competence) also were included in the meta-analysis. Analyses examined both overall achievement (included all achievement outcomes) and each outcome separately.

Children's behavior problems. Three broad categories of child behavior problems were included in the meta-analysis: (a) total behavior problems, (b) externalizing problems, and (c) internalizing problems. Total behavior problems included overall measures of behavior problems, for example, total scores on the Child Behavior Checklist (Achenbach, 1991) or the Behavior Problems Index (Zill & Peterson, 1986). Externalizing problems were assessed with the subscales of the Child Behavior Checklist, and with child-, maternal-, or teacher-reported and observer-rated defiance, compliance (reverse scored), risky behaviors, and aggressive or acting out behavior. Internalizing problems were assessed with the subscales of the Child Behavior Checklist and with child-, mother-, or teacher-reported and observer-rated depression, anxiety, or clinical problems. Analyses included both overall behavior problems and externalizing and internalizing problems separately.

Potential moderating variables. Sample- and study-level characteristics were examined as potential moderators of the association between mothers' early work outside of the home and children's behavioral problems and achievement.

Sample-level moderators. Most of the studies provided multiple effect sizes for the effect of early maternal employment on the behavioral and achievement outcomes for separate, often independent, samples of children. Characteristics of these samples were examined as potential moderating variables.

Family and demographic characteristics. Family characteristics, including SES, family structure, and family welfare status, were also examined as potential moderators of the relationship between early maternal employment and children's behavioral problems/achievement. Family structure was represented as a three-level categorical moderator, with majority signifying over 80% of the sample falling into that category: (a) majority two-parent households, (b) majority one-parent households, and (c) no majority (mixed one- and two-parent households). An indicator variable was also created to represent whether a family was receiving welfare in order to contrast these samples with community samples of families not receiving welfare.

SES was represented as a three-level categorical variable: (a) working/lower-middle class, (b) middle/upper-middle class, and (c) mixed SES. Some studies provided effects stratified by SES; in these cases, the separate effects for each independent subgroup were used. SES classifications were based on information provided by the authors of each study, including qualitative descriptions and quantitative classifications from an established index (e.g., the Hollingshead Four-Factor Index; Hollingshead, 1975). One study made SES classifications on the basis of a measure of parental educational attainment (Bogenschneider & Steinberg, 1994).

A five-level categorical variable was created to represent the race/ethnicity of each sample, with majority again signifying over 80% of the sample: (a) majority White, (b) majority Black, (c) majority Hispanic, (d) diverse (no single race/ethnicity greater than 80%), and (e) international (non-U.S. sample). Studies varied as to whether race/ethnicity descriptions were based on the mother or the child.

Characteristics of the children were included. For those studies that reported data for boys and girls separately, the results were

directly contrasted with child sex as a two-level categorical moderator. Child age/grade (at the time of the outcome assessment) was represented as a three-level categorical variable: (a) young children (ages 5 and under; preschool); (b) school-aged children (ages 6–12; kindergarten through sixth grade), and (c) adolescents (ages 13–18; middle and high school). If an age group overlapped these categories, such as 5–6 years, the older category was applied (in this case, school aged). When studies presented results for independent children at different ages, the independent subgroups were used; when studies presented results for the same children at different ages, the effects were averaged.

Timing of early employment. The timing of early maternal employment in the children's lives varied across studies and was represented as a categorical moderator. The categories created to represent the timing of employment were employment during (a) the first year of life, (b) the second year, (c) the third year, (d) the first 2 years, (e) the first 3 years, (f) the second and third years, and (g) more than the first 3 years. The studies in the last category measured employment across the first 4, 5, and 6 years of life and measured achievement outcomes during high school. However, the fourth category (i.e., the first 2 years of life) was not included in the achievement moderator analysis and the sixth category (i.e., the second and third years of life) was not included in the behavior problems moderator analysis because fewer than three studies presented information with this measurement point (three studies is a commonly used minimum; e.g., Lorber, 2004).

Source of information for behavioral outcomes. Studies examining children's behavioral problems varied in terms of who reported or observed the outcome. The categories of the variable representing the source of information of children's behavioral problems were (a) self-reported, (b) parent reported (primarily maternal reports), (c) teacher reported, and (c) observer rated.

Adjustment for contextual variables. Many studies presented effects that were both unadjusted and adjusted for different contextual variables. As such, moderator variables were created to represent adjustment for different types of contextual variables. First, a two-level categorical variable was created to contrast effect sizes that were adjusted for general sociodemographic variables (e.g., family income, parental education) to unadjusted effects. Second, some studies also presented effect sizes that were specifically adjusted for characteristics of child care, and a variable was created to contrast these effects with effects that were adjusted for characteristics other than child care. Almost exclusively, the child care characteristic controlled for was type of child care arrangement (e.g., center based, family day care). Too few studies included controls for quality of nonmaternal child care (e.g., caregiver-to-child ratio, observer ratings of the quality of caregiving) to include this dimension as a moderator. Other studies presented effects that were adjusted for paternal employment. A two-level moderator variable was created to contrast effects adjusted for paternal employment to effects adjusted for characteristics other than paternal employment. Effects were judged to be in the former category if adjusted for parental work status, income, or work hours.

Last, a two-level moderator variable was created to contrast effects that were adjusted for maternal employment that was concurrent with the outcome assessment to other adjusted effects. Effects were judged to be in the former category if adjusted for concurrent maternal employment status or work hours.

Study-level moderators. Study quality was evaluated on the basis of four components of the study: (a) publication source (journal article, book chapter or edited volume, government working paper or dissertation), (b) research design (longitudinal or retrospective), (c) the type of sample (convenience, school/community, random sample, subset of random sample), and (d) journal impact score of the publication outlet (rating from the Web of Science, *Journal Citation Reports,* 2005).

Other study-level moderators included whether the study used the NLSY data set, which was represented as an indicator variable (NLSY study or non-NLSY study), an indicator variable for sex of first author (male or female), and a variable representing the actual year of publication of each study.

Meta-Analytic Procedures

Effect sizes. The measure of effect size used was the *r* statistic. When not directly presented, correlations or *t* statistics were calculated from other statistics as suggested by Rosenthal (1991). When nonsignificant results were reported without information about the effect size or *p* value, a *p* value of .50 was entered (Rosenthal, 1995). In the overall meta-analysis, a positively signed *r* indicates that children of employed mothers have more of the outcome (i.e., higher achievement and more behavior problems) than children of nonemployed mothers. The sizes of the effects were gauged with Cohen's (1988) guidelines: small, $r = .10$; medium, $r = .30$; and large, $r = .50$.

When studies presented both adjusted and unadjusted effects, adjusted effects were used in the overall meta-analysis; adjusted and unadjusted effects were contrasted in the moderator analyses. When the same study presented both (a) effects that were adjusted for covariates that did not include child care, other employment characteristics, or paternal employment, and (b) effects adjusted for child care, other employment characteristics, or paternal employment, the effects unadjusted for these covariates were selected for use in the overall meta-analysis. Adjustment for these contextual variables in particular was examined in the moderator analyses by contrasting adjusted effects that did and did not control for child care or other employment characteristics.

The effect sizes representing the overall association of early maternal employment and children's later achievement and behavioral outcomes were calculated with the study as the unit of analysis by separately combining all achievement outcomes and all behavioral outcomes. Following the procedure in Goldberg et al. (2008), multiple effects from the same study based on the same sample of children (e.g., two or more measures of achievement, associations measured at multiple times) were treated as dependent and combined into a single effect size so that we did not violate the assumption of independence when combining effect sizes across studies. When multiple effects from the same study based on different subgroups of children (e.g., boys/girls) were presented, the information from the independent subgroups of children was combined into a single effect size. Therefore, a single, weighted value of the *r* statistic was used to represent each study to estimate the overall effect of maternal employment on children's behavioral and achievement outcomes.

We conducted the meta-analysis with Comprehensive Meta-Analysis (Version 2) and Stata (Version 10). We used random effects models, which calculate the error term on the basis of both

within- and between-study variability (Cooper & Hedges, 1994) and assume that the individual studies originated from different populations with varying effects sizes. This is in contrast to fixed effects models, which assume a common underlying effect for each study (Cooper & Hedges, 1994).

Moderator analysis. Effect size homogeneity was evaluated with the Q_{within} (Q_w) statistic (Hedges & Olkin, 1985). When the hypothesis of homogeneity was rejected, moderators were examined to explain heterogeneity among the effect sizes. Study-level moderators were evaluated with the meta-regression macro in Stata (Harbord & Higgins, 2008). Meta-regressions were used to examine the individual or unadjusted effect of each study-level moderator as well as their joint or adjusted effects.[1] Effect sizes were transformed to *z*s using the *r*-to-*z* transformation for the purposes of the meta-regressions. Variables were considered significant moderators if the slope (*b*) of the regression line was significantly different from zero with the $p = .05$ level of significance. We tested sample-level moderator variables in Comprehensive Meta-Analysis, using mixed effects models with the $p = .05$ level of significance for the $Q_{between}$ (Q_b) statistic.

The study was the unit of analysis when we used the meta-regressions to examine the study-level moderators. For the sample-level moderators, studies often presented information separately for independent subgroups of children; in this case, the unit of analysis was the independent subgroups or samples. An exception was made for tests of four moderator variables: adjusted versus unadjusted effects, adjustments for child care characteristics, adjustments for paternal employment, and adjustments for concurrent employment. In most cases, studies presented effects at both levels of these moderators based on the same sample of children (e.g., presented both unadjusted and adjusted effects). Therefore, two analytic strategies were adopted for testing these moderators. First, we used all studies that presented information for these moderators to calculate effects, assuming the effects calculated from the same samples of children were independent across the levels of the moderators. Second, we included only independent effects by omitting studies that presented effects for both levels of the moderators. The two analytic strategies always yielded the same inferential conclusion; therefore, we present only the results based on the first analytic strategy.

The number of studies that provided effects for some levels of the moderator variables was quite small. Levels were excluded from the analyses if there were fewer than three studies presenting effects for that level (see also Lorber, 2004). In these cases, the representativeness of the findings is uncertain, and the results should be interpreted tentatively.

Statistical power. We calculated power to establish whether the meta-analysis had the ability to detect a small effect, if present, using $r = .10$ to represent a small effect (Cohen, 1988) and a two-sided $p \leq .05$ level of significance. For all of the overall meta-analyses (overall achievement, overall behavior problems, and each individual outcome separately, utilizing both all NLSY studies and NLSY pooled), the power to detect a small effect is .99 (τ^2s ranging from .001 to .002). This indicates that the present meta-analysis has excellent statistical power to detect small effects, if present, of early maternal employment on children's achievement and behavior problems.

Results

Study Characteristics

Overall, the 69 studies yielded 1,483 effect sizes (median = 10, range = 1–162) and used samples ranging in size from 28 to 38,000. Because the sample size of 38,000 was an extreme outlier, it was winsorized to 9,267 (the sample size at the 95th percentile of the sample sizes) for all of the analyses. Approximately equal numbers of studies presented only achievement outcomes (29.0%), only behavior problem outcomes (33.3%), and both achievement and behavior problem outcomes (37.7%). Most studies (81.2%) were published journal articles; 30.4% relied on NLSY data. In addition, the majority of studies utilized a longitudinal design (73.9%). Most studies relied on a sample that was mixed in SES (56.5%), but many samples utilized primarily working/lower-middle-class (29.0%) and middle-/upper-class (17.4%) samples. Similarly, most studies had majority White (39.1%) or ethnically mixed (43.5%) samples; however, there were also several studies that presented effect sizes for majority Black (17.4%) or Hispanic (8.7%) samples. Most studies also presented effect sizes for two-parent (43.5%) or mixed (46.4%) family structures, although 17.4% of effect sizes were for majority one-parent samples. Outcomes were assessed at a variety of children's ages, with 71.0%, 40.6%, and 13.0% of effect sizes at 0–5, 6–12, and 13 or more years, respectively. Tables 1 and 2 present summary statistics describing the studies included in the meta-analysis of the achievement outcomes and behavioral outcomes, respectively.

Preliminary Analyses

Before conducting the overall meta-analyses, we examined two issues: (a) nonindependence due to the subset of the studies that were based on the NLSY and (b) publication bias.

Analytic strategies for including NLSY studies. A subset of the 69 studies included in the meta-analysis ($k = 21$) analyzed data from the NLSY. Despite the potential problem of nonindependence raised by including the NLSY studies, we decided for several reasons to include all of these studies.

First, the NLSY studies that met criteria for the meta-analysis varied in terms of the subsample of children and mothers included in the analyses, the ethnic composition of the sample or samples, the age of the children at the time of measurement, and the definitions of the maternal employment variable or variables. The sample sizes for the NLSY studies ranged from less than 200 to over 4,000. Four of the studies restricted their analyses to working/lower-middle-class samples (nine included a mix of classes). In addition, several of these studies excluded Hispanic participants, and one restricted its analyses to the White subsample of mothers and children. Furthermore, the majority of the studies provided effects of employment when children were 0 through 5 years of age; however, more than half also provided effects when children were between ages 6 and 12, and one study measured achievement during high school. Finally, the measures of maternal employment

[1] Journal impact factor was not included in the multiple meta-regression because it applies only to journal articles and it was not available for some journals.

Table 1
Study- and Sample-Level Characteristics for Broad Achievement Outcome

Characteristic	*k*	%
Study-level covariates		
Publication source		
Journal article	35	76.1
Book/chapter in edited volume	4	8.7
Government working paper/dissertation	7	15.2
Data source: National Longitudinal Survey of Youth	17	37.0
Research design		
Longitudinal	39	84.8
Cross-sectional	—	
Retrospective	7	15.2
Sample source		
Convenience	2	4.3
School, community, or health center	14	30.4
Subset of random sample	17	37.0
Random sample	12	26.1
Missing	1	2.2
Impact factor (median; min, max)	34	1.52; .63, 3.62
Sex of first author (% male)	13	28.3
Publication year (median; min, max)	42	2001; 1961, 2009
1960–1969	1	2.2
1970–1979	—	—
1980–1989	8	17.4
1990–1999	10	21.7
2000–2009	27	58.7
Sample type		
Welfare	9	19.6
Clinic	0	0.0
Sample-level covariates[a]		
Type of achievement outcome		
Formal math achievement tests	15	32.6
Formal reading achievement tests	18	39.1
Achievement	17	37.0
IQ–verbal	15	32.6
IQ	17	37.0
Grade point average	3	6.5
Teacher ratings	5	10.9
Employment contrast		
Employed versus not employed	38	82.6
Full-time versus no employment	14	30.4
Part-time versus no employment	13	28.3
Full-time versus part-time employment	7	15.2
Employed with continuous hours	14	30.4
Socioeconomic status		
Working/lower-middle class	17	37.0
Middle/upper class	8	17.4
Mixed	25	54.3
Not reported	2	4.3
Ethnicity		
White	18	39.1
Black	10	21.7
Hispanic	5	10.9
Mixed	21	45.7
International	5	10.9
% White (median; min, max)	34	58.8; 0, 100
% Black (median; min, max)	28	37.1; 0, 100
% Hispanic (median; min, max)	27	4.0; 0, 60
Age/grade of child at assessment		
0–5 years (infancy–prekindergarten)	32	69.6
6–12 years (kindergarten, elementary)	22	47.8
13+ years	7	15.2
Family structure		
Two parents	16	34.8
One parent	9	19.6
Mixed	25	54.3
Not reported	1	2.2

(*table continues*)

Table 1 (*continued*)

Characteristic	*k*	%
Timing of maternal employment (child's life span)		
First year	22	47.8
Second year	8	17.4
Third year	4	8.7
Employment across first 2 years	1	2.2
Employment across first 3 years	13	23.8
Employment across Years 2–3	5	10.9
Employment across more than first 3 years	15	32.6

Note. No. of studies = 46. One study did not present an employed versus not employed contrast; therefore, it is not included in subsequent tables. Dashes indicate that there were no studies in a category.
[a] Percentages for the sample-level covariates add to more than 100 because individual studies often provided effect sizes for more than one level of the sample-level covariates.

chosen across these studies included work in the first year, work across the first 3 years, work in the second and third years, and work during the first 6 years of life (with achievement measured in adolescence). This heterogeneity reduced the potential for nonindependence in the NLSY studies.

Two additional strategies were developed to handle the potential issue of nonindependence. First, we pooled the effect sizes for the individual NLSY studies to form a single effect size to represent the NLSY studies, which we used in the calculation of the overall effect size for the combined achievement outcomes and the individual achievement outcomes, as well as for the individual and combined behavioral outcomes. These results are presented in Tables 3 and 4 along with the effect sizes calculated with all of the individual NLSY studies. Second, we followed the strategy used in Goldberg et al.'s (2008) meta-analysis. To represent the range offered by the NLSY studies, those with the most negative and the most positive effects (designated as NLSY–low and NLSY–high, respectively) were identified. All of the analyses presented here were replicated by running the analyses once with the NLSY–low study and once with the NLSY–high study (Baydar & Brooks-Gunn, 1991; Desai et al., 1989; Hill et al., 2005; Ruhm, 2004; and Smith, Brooks-Gunn, Klebanov, & Lee, 2000, were utilized at least once as the representative NLSY–low or NLSY–high study). In this way, these analyses had a study that represented each end of the NLSY contribution to the effect sizes. With few exceptions, which are noted in the text and tables, all of the findings were replicated with NLSY substitution (although the substitution, because of the decrease in *k* and the resulting loss of power, often reduced significance). Taken together, the variability in the NLSY studies and the replication of findings with NLSY substitution and pooled analyses supported the presentation of findings based on all available studies. Therefore, we present the results of the analyses utilizing all studies.

Publication bias. Publication bias arises when the likelihood of a study being published is associated with the statistical significance of the effect size. Funnel plot symmetry was examined to check for the potential of publication bias (see Figure 1), and the Egger's test was used to more objectively test for its presence (Egger, Smith, Schneider, & Minder, 1997). When the Egger's test suggested the presence of publication bias (using the $p = .05$ level of significance), a fixed effects trim-and-fill method (Duval, 2005; Sutton, 2005) was implemented with the Metatrim macro in Stata (Version 10) to calculate the average, weighted effect size.

Two Egger's tests were significant: one for overall achievement when a pooled effect size for all NLSY studies was used ($p = .003$) and the other for IQ when all NLSY studies were pooled ($p = .006$). Therefore, average effect sizes with fixed effect trim-and-fill procedures were calculated for these two analyses; of importance, the effect sizes were not significant with and without the use of the trim-and-fill procedure. No other Egger's tests were significant, although this test neared significance for all achievement outcomes when all studies were used ($p = .056$). To be conservative, the fixed effect trim-and-fill results are presented in Table 3 (as a footnote); however, these results are not interpreted because the Egger's test fell short of significance.

Achievement Outcomes

Employment (full-time and/or part-time) versus no employment. The first set of analyses examined associations between mothers' work outside the home early in life and children's achievement, utilizing all achievement outcomes and all times at which employment was assessed. Forty-five studies were included in this first meta-analysis that compared achievement outcomes of children with employed mothers and nonemployed mothers (one study was excluded because it did not present a contrast for employment vs. no employment; Stafford, 1987). For all achievement outcomes combined, the average correlation estimated from all of the studies was very small and not significant (see Table 3). When pooling the results of the 17 individual NLSY studies to form a single effect size to represent these studies, the average effect size for all achievement outcomes combined was also not significant. However, the analyses utilizing the NLSY–low study produced a significant positive association between employment and overall achievement. Results for the individual achievement outcomes of IQ, formal achievement tests, and grades followed a similar pattern, with the exception of teacher ratings, for which there was a significant positive association between maternal employment early in the child's life and teacher ratings of later achievement. In addition, for IQ, the analyses utilizing the NLSY–high study produced a significant positive association.

Heterogeneity was present among the effect sizes for all achievement outcomes combined and the individual outcomes of IQ, formal achievement test, and grades. As such, moderators of the association between early maternal employment and children's achievement were evaluated to help explain the observed hetero-

Table 2
Study- and Sample-Level Characteristics for the Broad Behavior Problems Outcome

Characteristic	*k*	%
Study-level covariates		
Publication source		
Journal article	41	83.7
Book/chapter in edited volume	4	8.2
Government working paper/dissertation	4	8.1
Data source: National Longitudinal Survey of Youth	13	26.5
Research design		
Longitudinal	34	69.4
Cross-sectional	9	18.4
Retrospective	6	12.2
Sample source		
Convenience	1	2.0
School, community, or health center	27	55.1
Subset of random sample	15	30.6
Impact factor (median; min, max)	31	1.58; 0.16, 4.43
Random sample	6	12.2
Publication year (median; min, max)	44	2000; 1961, 2009
1960–1969	1	2.0
1970–1979	—	—
1980–1989	2	4.1
1990–1999	19	38.8
2000–2007	27	55.1
Sample type		
Welfare	10	20.4
Clinic	2	4.1
Sample-level covariates[a]		
Type of behavior problem outcome		
External	31	63.3
Internal	18	36.7
Total behavior problems	19	38.8
Defiance	1	2.0
Employment contrast		
Employed versus not employed	44	89.8
Full-time versus no employment	11	22.4
Part-time versus no employment	10	20.4
Full-time versus part-time employment	7	14.3
Employed with continuous hours	17	34.7
Social economic status		
Working/lower-middle class	14	28.6
Middle/upper class	7	14.3
Mixed	26	53.1
Not reported	2	4.1
Ethnicity		
White	20	40.8
Black	9	18.4
Hispanic	4	8.2
Mixed	19	38.8
International	8	16.3
% White (median; min, max)	35	74.0; 0, 100
% Black (median; min, max)	31	23.4; 0, 100
% Hispanic (median; min, max)	28	4.5; 0, 60
Age/grade of child at assessment		
0–5 years (infancy–prekindergarten)	38	77.6
6–12 years (kindergarten, elementary)	17	34.7
13+ years	4	8.2
Family structure		
Two parents	22	44.9
One parent	8	16.3
Mixed	21	42.9
Not reported	1	2.0
Timing of maternal employment (child's life span)		
First year	20	40.8
Second year	7	14.3

(*table continues*)

Table 2 (*continued*)

Characteristic	*k*	%
Third year	5	10.2
Employment across first 2 years	4	8.2
Employment across first 3 years	12	24.5
Employment across Years 2–3	2	4.1
Employment across more than first 3 years	14	28.6

Note. No. of studies = 49. One study did not present an employed versus not employed contrast; therefore, it is not included in subsequent tables. Dashes indicate that there were no studies in a category.
[a] Percentages for the sample-level covariates add to more than 100 because individual studies often provided effect sizes for more than one level of the sample-level covariates.

geneity. The results of these analyses for the sample-level moderators are presented in Table 5, whereas the results of the study-level moderators are presented in the text (and available in the supplemental materials online). For teacher ratings, significant heterogeneity was not found among the effect sizes; therefore, moderator analyses were not conducted.

Moderators: Sample characteristics. Discussed next are the sample-level characteristics that significantly moderated the association between early employment and achievement (family structure, welfare, timing of employment, whether effects were adjusted for control variables, whether effects were adjusted for concurrent employment characteristics) or produced significant individual point estimates (SES, whether effects were adjusted for child care; see Table 5). Several other sample-level characteristics (race/ethnicity, child sex, and child age/grade) were not significant moderators of the association between early maternal employment and children's achievement and did not produce significant individual point estimates (Q_{Bs} ranged from .024 to 1.34; the nonsignificant point estimates were negligible; the largest absolute value was $r = .01$).

Family structure. Family structure was a significant moderator for formal achievement tests. Examination of the individual effect sizes indicated that, for majority two-parent samples, there was a negative association between early employment and achievement; this effect was significant for formal achievement tests only. For majority one-parent samples, there was a significant positive association between early employment and achievement. Although the moderator was not significant when all achievement outcomes were considered or when IQ was examined separately, the point estimate for majority one-parent samples was also significant and positive. The effects for samples that were mixed in terms of family structure were nonsignificant.

Table 3
Effect of Early Employment on Achievement and Behavioral Outcomes

Outcome	*k*	*r*	95% CI	*Q* (*df*)
Achievement outcomes				
Overall				
All studies[a]	45	.001	[−.011, .013]	107.01 (44)**
All studies with NLSY pooled	29	.011	[−.028, .007]	75.00 (28)**
IQ				
All studies[b]	30	.001	[−.017, .018]	61.49 (29)**
All studies with NLSY pooled	16	−.004	[−.031, .023]	27.76 (15)*
Formal achievement tests				
All studies	29	−.009†	[−.018, .001]	38.43 (28)†
All studies with NLSY pooled	20	−.009	[−.020, .003]	30.22 (19)*
Teacher ratings: All studies[c]	4	.059*	[.007, .110]	2.92 (3)
Grade point average: All studies[c]	3	.022	[−.045, .089]	10.80 (2)*
Behavioral outcomes				
Overall				
All studies	48	−.005	[−.020, .011]	91.42 (47)**
All studies with NLSY pooled	35	−.005	[−.022, .011]	55.39 (34)*
Externalizing				
All studies	32	.008	[−.011, .028]	66.01 (31)**
All studies with NLSY pooled	25	.005	[−.017, .028]	53.19 (24)**
Internalizing: All studies[c]	18	−.043*	[−.079, .007]	42.05 (17)**

Note. Positive *r*s indicate that children of employed mothers had higher achievement or more behavior problems than children of mothers who were not employed. NLSY = National Longitudinal Survey of Youth.
[a] Effect size from fixed effect trim-and-fill procedure was $r = -.014$, CI [−.028, .000], $p = .044$; analysis utilizing NLSY–low produced a significant association, $r = .017$, $p = .046$. [b] Analysis utilizing NLSY–high produced a significant association, $r = .031$, $p = .015$. [c] NLSY pooled analyses not performed because there were no NLSY studies with teacher ratings, only one NLSY study with grade point average, and only two NLSY studies with internalizing.
† $p < .10$. * $p < .05$. ** $p < .001$.

Table 4
Effect of Full- and Part-Time Early Employment on Achievement Outcomes

Achievement outcome and employment	*k*	*r*	95% CI	*Q* (*df*)
Overall achievement				
Full-time versus not employed				
All studies	14	−0.001	[−.028, .026]	63.89 (13)**
All studies with NLSY pooled	11	−0.001	[−.028, .025]	32.58 (10)**
Part-time versus not employed				
All studies	12	−0.002	[−.017, .013]	6.10 (11)
All studies with NLSY pooled	10	−0.002	[−.018, .013]	5.03 (9)
Part-time versus full-time				
All studies	7	0.006	[−.034, .047]	18.96 (6)*
All studies with NLSY pooled	5	0.020	[−.016, .056]	6.09 (4)
IQ				
Full-time versus not employed				
All studies	9	−0.003	[−.039, .032]	29.99 (8)**
All studies with NLSY pooled	5	−0.002	[−.031, .027]	0.32 (4)
Part-time versus not employed				
All studies	8	−0.001	[−.023, .020]	1.24 (7)
All studies with NLSY pooled	6	−0.002	[−.023, .029]	0.19 (5)
Part-time versus full-time				
All studies	5	−0.015	[−.059, .029]	7.71 (4)
All studies with NLSY pooled	3	−0.013	[−.064, .038]	0.17 (3)
Formal achievement tests				
Full-time versus not employed				
All studies	10	−0.023	[−.053, .007]	39.88 (9)**
All studies with NLSY pooled	7	−0.024**	[−.039,−.009]	7.94 (7)
Part-time versus not employed				
All studies	9	−0.010	[−.027, .007]	6.36 (8)
All studies with NLSY pooled	7	−0.009	[−.027, .009]	3.65 (6)
Part-time versus full-time				
All studies	4	−0.034	[−.102, .034]	17.68 (3)**
All studies with NLSY pooled	3	−0.005	[−.064, .054]	3.22 (2)

Note. Positive *r*s indicate that children of employed mothers had higher achievement than children of mothers who were not employed or that children of full-time employed mothers had higher achievement than children of part-time employed mothers. NLSY–high versus NLSY–low analysis not done because there were three or fewer NLSY studies for each employment contrast. NLSY = National Longitudinal Survey of Youth.
* $p < .05$. ** $p < .005$.

Welfare sample. Whether the sample was composed of families receiving welfare was a significant moderator for overall achievement and IQ. In addition, the same pattern of individual effect sizes was evident for overall achievement, formal achievement tests, and IQ. Examination of these individual effect sizes revealed that there was a positive association between early maternal employment and achievement for welfare samples; this effect was significant for overall achievement and IQ. For nonwelfare samples, there was a significant negative association between employment and formal achievement tests; the point estimates were of a comparable size but nonsignificant for overall achievement and IQ.

SES. SES was a nearly significant moderator of the association between early maternal employment and formal achievement tests. In addition, this analysis produced a significant, negative point estimate for middle-/upper-class samples. The point estimates for working/lower-middle-class and mixed-SES samples were also negative but were nonsignificant.

Adjusted versus unadjusted effects. Whether the effect was adjusted for other contextual variables (e.g., family income, parental education) was a significant moderator for overall achievement, formal achievement tests, and IQ. The association between maternal employment and children's achievement unadjusted for other variables was small, significant, and positive. The adjusted effects, however, indicated a small negative association that was significant only for formal achievement tests.

Timing of early maternal employment. The time in children's lives when maternal employment was measured was a moderator of the association between employment and children's achievement; this moderator was significant for overall achievement, formal achievement tests, and IQ. Examination of the individual point estimates revealed the following pattern: Employment measured in Year 1 produced a small negative effect (significant for formal achievement tests and nearly significant for overall achievement), whereas employment in Year 2 (significant for IQ) or employment in Years 2 and 3 (significant for overall achievement and formal achievement tests) was also small and significant but positive. The individual point estimates for the other categories—Year 3, Years 1 through 3, and more than 3 years—were not significant, although they suggested both positive and negative directions for the association between employment and achievement.

Adjusted for concurrent employment. Whether effects were adjusted for concurrent employment characteristics was a significant moderator only for overall achievement. Examination of the

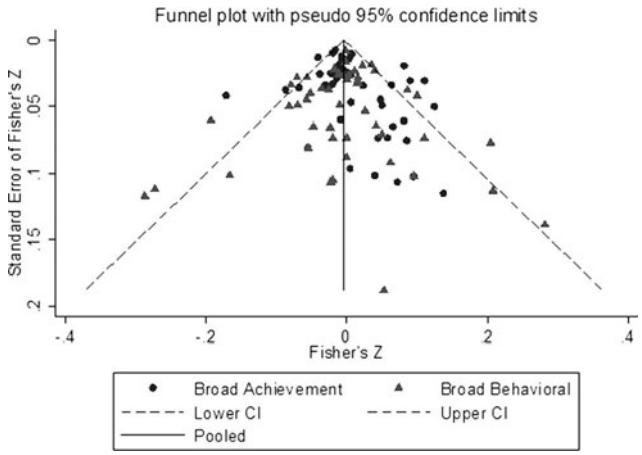

Figure 1. Funnel plot of effect sizes for early maternal employment in relation to children's achievement and behavior problems. Egger's test for broad achievement outcomes: coefficient for bias (*SE*) = .761 (.387), p = .056. Egger's test for broad behavioral outcomes: coefficient for bias (*SE*) = −.177 (.335), p = .601.

individual point estimates revealed a significant, negative association between early employment and achievement when effects were not adjusted for concurrent employment. This moderator was not significant for formal achievement tests or IQ examined separately; however, in both cases the individual point estimates for the association between early employment and achievement not adjusted for concurrent employment were significant and negative.

Adjusted for child care. Whether effects were adjusted for child care was not a significant moderator of any achievement measure. However, when IQ was examined separately, this moderator analysis indicated a significant, negative association between employment and IQ for effects adjusted for child care. The point estimate for effects not adjusted for child care was of a similar magnitude and direction but was not significant.

Moderators: Study characteristics. When considered independently, a majority of the study-level characteristics did not significantly moderate the association between early maternal employment and children's overall achievement, including publication source, type of research design, journal impact scores, sex of first author, sample source, and year of publication (bs < .08, ps > .088). The unadjusted effects of two others—sample source and NLSY—were significant, $F(2, 41) = 4.90$, $p = .012$, and $F(1, 43) = 5.66$, $p = .022$, respectively. The average effect size from studies using samples of convenience (e.g., from school, community, or health centers) was significantly larger than the average effect size from studies using random samples ($b = .039$, $p < .05$; $r = .040$, $p = .014$, and $r = -.004$, $p = .546$, respectively), whereas the average effect size for studies that utilized subsets of random samples was not significantly different from the average effect size of studies using random samples. Studies based on the NLSY had smaller effect sizes, on average, than the other studies ($b = -.034$, $p = .022$; $r = -.017$, $p = .077$, and $r = .015$, $p = .080$, respectively).

When looking at the joint effect of the study-level moderators—$F(8, 35) = 2.02$, $p = .074$, joint test for all study characteristics—there was no difference in the average effect size between NLSY studies and other studies ($b = -.015$, $p > .05$) or between the effect sizes for samples of convenience and random samples ($b = .031$, $p > .05$). We replicated the unadjusted and adjusted analyses, using the NLSY study with the smallest effect size and again using the NLSY study with the largest effect, and this yielded the same results for all moderators with two exceptions: (a) the sample source moderator was not significant in the unadjusted analyses when NLSY–low or NLSY–high was utilized, and (b) in the NLSY–low analysis, the unadjusted effect of male first author was significant ($b = -.039$, $p = .012$), with male first authors presenting lower average effect sizes than female first authors.

The moderating influence of study-level characteristics was also examined for the individual achievement outcomes of IQ and formal achievement tests. None of the study-level characteristics were significant moderators of the association between early maternal employment and formal achievement tests when the moderators were analyzed individually (unadjusted; ps > .06) or jointly (adjusted; ps > .31). This same nonsignificant pattern emerged for IQ with the exception of the unadjusted effect of whether the study used the NLSY data set. The average effect size between early maternal employment and IQ from studies based on the NLSY data set was smaller than the average effect size from other studies ($b = -.05$, $p = .021$; $r = -.018$, $p = .004$, and $r = .026$, $p = .088$, respectively). When adjusting for the study-level characteristics, this difference was no longer significant ($b = -.03$, $p = .29$).

Extent of employment. The second set of meta-analyses focused on the association of the extent, or intensity, of employment with children's achievement. Extent of employment is presented in two ways: (a) a contrast between part-time employment and no employment ($k = 12$) and between full-time employment and no employment ($k = 14$) and (b) a full-time versus part-time employment contrast (no women who were not employed were included; $k = 7$).

There was no significant effect of full-time employment or part-time employment when contrasted with no employment for the overall achievement outcome (across all early employment time points; see Table 4). Additionally, there was no discernable difference in children's overall achievement when part-time employment was compared with full-time employment. These results were replicated with a single pooled estimate of the effect size for the NLSY studies in these analyses. Furthermore, in results not shown, there were no significant differences between effects for full-time employment and no employment compared with effects for part-time employment and no employment, $Q_{Bs}(1) < 1.00$, ps > .32.

Results for the individual achievement outcomes of IQ and formal achievement tests revealed similar patterns with the exception of formal achievement tests when full-time employment was contrasted with no employment with the NLSY studies pooled. This effect was negative, suggesting that scores on formal achievement tests are lower when employment is full-time than when there is no employment. This finding did not replicate when all NLSY studies were included.

A significant amount of heterogeneity was present among the effect sizes when full-time employment was contrasted with no employment for the overall achievement outcome and the individual outcomes of IQ and formal achievement tests. Heterogeneity was also present when part-time employment was contrasted with full-time employment for the overall achievement outcome as well

Table 5
Sample-Level Moderators of the Effect of Early Maternal Employment on Children's Achievement[a]

Moderator	k_s	r	95% CI	Q_w	Q_b
Overall achievement					
Family structure					4.30
Majority two parent	14	−.001	[−.023, .022]	33.75**	
Majority one parent	10	.029*	[.002, .057]	6.94	
Mixed one and two parent	21	−.004	[−.022, .014]	68.08**	
Welfare sample					7.99**
No	37	−.005	[−.017, .006]	91.36**	
Yes	10	.052*	[.014, .090]	14.37	
Adjusted/unadjusted effects					35.00**
Adjusted	38	−.007	[−.020, .005]	89.19**	
Unadjusted	21	.082**	[.055, .109]	80.37**	
Concurrent employment characteristics[b]					4.42*
Adjusted for	15	.010	[−.013, .032]	45.24**	
Not adjusted for	27	−.019*	[−.033,−.005]	49.34**	
Timing of employment[c,d]					11.42*
Year 1	20	−.021†	[−.043, .002]	53.25**	
Year 2	8	.007	[−.017, .031]	12.01†	
Year 3	4	.011	[−.022, .043]	2.61	
Years 1–3	12	.004	[−.028, .035]	41.17**	
Years 2–3	5	.029**	[.010, .048]	2.35	
More than Years 1–3	14	.018	[−.006, .041]	41.17**	
Formal achievement tests					
Family structure					9.38*
Majority two parent	12	−.021*	[−.038,−.005]	15.60	
Majority one parent	9	.034*	[−.004, .065]	3.67	
Mixed one and two parent	12	−.005	[−.016, .007]	14.94	
Welfare sample					1.90
No	25	−.009*	[−.019,−.000]	36.05†	
Yes	7	.015	[−.019, .050]	6.48	
Socioeconomic status					4.79†
Working/lower middle	14	−.001	[−.030, .028]	18.64	
Middle/upper	9	−.035**	[−.057,−.012]	8.27*	
Mixed	13	−.008	[−.020, .004]	21.07*	
Adjusted/unadjusted effects					41.19**
Adjusted	26	−.010**	[−.016,−.003]	24.47	
Unadjusted	16	.090**	[.060, .119]	63.42**	
Concurrent employment characteristics[b,e]					0.02
Adjusted for	10	−.009	[−.022, .003]	9.20	
Not adjusted for	19	−.011*	[−.021,−.001]	19.46	
Timing of employment[c]					14.44*
Year 1	14	−.023*	[−.041,−.004]	21.05†	
Year 2	5	−.009	[−.026, .008]	4.44	
Year 3	4	.015	[−.018, .047]	2.02	
Years 1–3	7	−.003	[−.026, .021]	8.53	
Years 2–3	5	.028*	[.007, .049]	2.79	
More than Years 1–3	8	−.007	[−.027, .013]	13.20†	
IQ					
Family structure		3.70			
Majority two parent	8	.001	[−.028, .030]	8.50	
Majority one parent	5	.052*	[.002, .101]	8.65†	
Mixed one and two parent	16	−.005	[−.039, .030]	73.26**	
Welfare sample					4.75*
No	26	−.005	[−.028, .018]	71.07**	
Yes	5	.063*	[.006, .120]	12.03*	
Adjusted/unadjusted effects					18.38**
Adjusted	22	−.017	[−.040, .007]	80.09**	
Unadjusted	15	.085**	[.045, .125]	59.02**	
Concurrent employment characteristics[b,e]					1.67
Adjusted for	8	−.000	[−.036, .036]	24.41**	
Not adjusted for	15	−.030*	[−.059,−.002]	34.03**	
Child care[b]					0.004
Adjusted for	12	−.022*	[−.039,−.004]	12.04	
Not adjusted for	19	−.021	[−.047, .006]	56.44**	

(*table continues*)

Table 5 (*continued*)

Moderator	k_s	*r*	95% CI	Q_w	Q_b
Timing of employment[c,d]					15.79**
Year 1	19	−.016	[−.042, .009]	59.06**	
Year 2	5	.060**	[.027, .092]	.85	
Years 1–3	11	.003	[−.039, .045]	47.99**	
Years 2–3	3	.023	[−.008, .053]	1.21	
More than Years 1–3	5	.0498*	[.003, .095]	3.18	

Note. k_s = no. of independent subgroups or samples of children, except for adjusted/unadjusted effects and adjusted for concurrent employment characteristics (see Methods section). Positive *r*s indicate that children of employed mothers had higher achievement than children of mothers who were not employed.

[a] Overall achievement analyses examined formal achievement tests, intellectual functioning, grades, and teacher ratings of children's achievement. There were too few studies to separately examine the moderators of maternal employment in relation to grade point average and teacher ratings; therefore, moderators are examined only by individual outcome in relation to formal achievement tests and intellectual functioning. [b] Comparison is between adjusted effects (without child care/without concurrent employment characteristics) and adjusted effects, including child care or concurrent employment characteristics. [c] For all achievement outcomes combined, as well as each examined separately, there were fewer than three studies in the Years 1–2 category; therefore, it was not included in the moderator analyses. In addition, for the IQ analyses, there were also fewer than three studies in the Year 3 category; therefore, it was also excluded from the moderator analyses. [d] The Years 1–2 category was excluded from the moderator analysis because there were too few studies (only one) that presented effects for this time. [e] For formal achievement tests, the same pattern was evident when adjusted for child care and paternal employment characteristics (i.e., the moderator was nonsignificant, the effect size for not adjusted for child care/paternal employment was significantly negative, and the effect size for adjusted was of a comparable magnitude and direction but was not significant).

† $p < .10$. * $p < .05$. ** $p < .005$.

as for formal achievement tests. However, most moderator analyses were not performed because of the small number of studies presenting effects for extent of employment.

However, some research suggests that the intensity of work during the first year of life is particularly important (Brooks-Gunn et al., 2002; Gregg et al., 2005). Therefore, in results not shown, we compared part-time employment with no employment ($k = 7$) and full-time employment with no employment ($k = 8$) for the first year of life only. There were no significant differences between effects for full-time employment versus no employment compared with effects for part-time employment versus no employment during the first year, $Q_{Bs}(1) < 0.80$, $ps > .37$.

Behavior Problem Outcomes

Employment (full-time and/or part-time) versus no employment. The next set of analyses examined associations between mothers' work outside the home early in life and children's behavior problems combined over all times at which employment was assessed. In this second meta-analysis, we included 45 studies that compared behavior problem outcomes of children with employed mothers and nonemployed mothers (one study was excluded because it did not present a contrast for employment vs. no employment; Joshi & Bogen, 2007). For all behavioral outcomes combined, the average effect size estimated from all of the studies was very small and not significant (see Table 3). When pooling the results of the 13 individual NLSY studies to form a single effect size to represent these studies, the average effect size for all behavior outcomes combined was also not significant. Effect sizes for the separate behavioral outcomes of externalizing behaviors followed a similar pattern of nonsignificance. However, there was a significant negative association between employment and internalizing behaviors.

Heterogeneity was present among the effect sizes for overall behavior problems and each individual outcome. As such, moderators of the association between early maternal employment and behavior problems were evaluated to help explain the observed heterogeneity. Results of these analyses are discussed next; the results of the sample-level moderators are presented in Table 6, whereas the results of the study-level moderators are presented in the text (and available in the supplemental materials online).

Moderators: Sample characteristics. Family structure and source of information were the only significant moderators of the association between early maternal employment and behavior problems (see Table 6). Whether effects were adjusted for control variables or for child care were nearly significant moderators and revealed significant point estimates. These results are discussed in more detail next. All of the other sample-level characteristics were not significant moderators of this association (i.e., SES, race/ethnicity, child sex, child age/grade, timing of employment, whether the sample was a welfare sample, whether the effects were adjusted for other maternal or paternal employment characteristics. Q_{Bs} ranged from 0.01 to 3.17. Nonsignificant effect sizes were small; the largest absolute value was $r = .08$).

Family structure. Family structure was a significant moderator for externalizing behaviors and a nearly significant moderator for overall behavior problems and internalizing behaviors. Examination of the individual effect sizes revealed that employment relative to no employment was significantly associated with decreased overall behavior problems and externalizing behaviors for majority one-parent samples; this association was nearly significant for internalizing behaviors. Also, employment was associated with significant decreases in internalizing behaviors for two-parent families and increases in externalizing behaviors for mixed one- and two-parent samples.

Source of information for behavior problems. Source of information for behavior problems was a significant moderator for externalizing behaviors. Examination of the individual point estimates revealed that teacher-reported effects were significant and positive, such that employment relative to no employment was associated with increased teacher-reported behavior problems; all other effects were nonsignificant.

Table 6
Sample-Level Moderators of the Effect of Early Maternal Employment on Children's Behavior Problems

Behavior problem and moderator	k_s	r	95% CI	Q_w	Q_b
Overall behavioral problems[a]					
Family structure					5.03
Majority two parent	20	−.000	[−.028, .028]	30.23*	
Majority one parent	10	−.052*	[−.096, −.008]	18.18*	
Mixed one and two parent	18	.004	[−.019, .026]	31.99*	
Adjusted/unadjusted effects[b]					2.78†
Adjusted	35	.001	[−.015, .017]	67.07**	
Unadjusted	31	−.020*	[−.039, −.001]	57.12**	
Externalizing behaviors					
Family structure					10.23*
Majority two parent	16	.009	[−.030, .047]	35.10**	
Majority one parent	5	−.067*	[−.118, −.015]	5.30	
Mixed one and two parent	12	.023*	[.005, .040]	9.87	
Adjusted/unadjusted effects[b]					3.31†
Adjusted	26	.013	[−.007, .033]	45.28*	
Unadjusted	20	−.018	−.045, .009]	47.60**	
Child care[c,d]					1.20
Adjusted for	8	−.006	[−.053, .041]	31.32*	
Not adjusted for	20	.023*	[.002, .043]	31.32*	
Source of information[e]					6.01*
Parent reported	25	−.002	[−.021, .024]	43.67*	
Teacher reported	4	.163*	[.025, .296]	30.76**	
Other	3	.087	[−.089, .257]	10.28**	
Internalizing behaviors					
Family structure					5.37†
Majority two parent	9	−.043*	[−.081, −.004]	11.83	
Majority one parent	3	−.137†	[−.281, .013]	10.51**	
Mixed one and two parent	4	.003	[−.032, .037]	0.68	

Note. k_s = no. of independent subgroups or samples of children, except for adjusted/unadjusted effect and adjusted for concurrent employment characteristics (see Methods section). Positive *r*s indicate that children of employed mothers had more behavior problems than children of mothers who were not employed.
[a] Outcomes include externalizing behaviors, internalizing behaviors, and total behavior problems. [b] When only independent effect sizes were utilized, results were slightly different. Neither the moderator nor the effect sizes were significant, although the effect sizes were comparable. [c] Comparison is between adjusted effects (without child care) and adjusted effects including child care or concurrent employment characteristics. [d] For externalizing behaviors, the same pattern was evident for the moderator of adjustment for paternal employment characteristics (i.e., the moderator was not significant, the effect size not adjusted for paternal employment was significantly negative, and the effect size adjusted for paternal employment was negative but not significant). [e] There were fewer than three studies that provided effect sizes for self-reported externalizing behaviors; therefore, self-reports were not included in the moderator analysis.
† $p < .10$. * $p < .05$. ** $p < .005$.

Adjusted versus unadjusted effects. Whether effects were adjusted was a nearly significant moderator for overall behavior problems and externalizing behaviors. Examination of the individual point estimates revealed that unadjusted effects were positive but nonsignificant. For overall behavior problems, adjusted effects were significantly negative; for externalizing behaviors, adjusted effects were also negative and of a comparable magnitude but were not significant.

Adjusted for child care. Whether effects were adjusted for child care was a nearly significant moderator for externalizing behaviors. Examination of the individual point estimates revealed that effects not adjusted for child care were significant and positive; effects adjusted for child care were not significant.

Moderators: Study characteristics. None of the study-level characteristics were significant moderators of the effect of early maternal employment on overall behavior problems (*p*s > .10). When externalizing ($k = 32$) and internalizing ($k = 18$) were considered separately, none of the study-level characteristics were significant moderators with the exception of sex of first author for externalizing behaviors. Both the unadjusted ($b = -.04$, $p = .022$) and adjusted effects ($b = -.08$, $p = .048$) were significant, with male first authors reporting a more negative average effect size than female first authors (unadjusted effects: $r = -.028$, $p = .088$, and $r = .028$, $p = .020$, respectively). When we used substitution of the NLSY–low and NLSY–high studies, sex of first author was a nearly significant ($p < .10$) moderator with the same pattern of findings. For the $k = 18$ studies that presented information on the effects of early maternal employment on children's internalizing behaviors, none of the study-level characteristics were significant moderators of this relationship (*p*s > .26). Because only two NLSY studies presented information on internalizing behaviors, the NLSY–low and NLSY–high analyses were not performed.

Extent of employment. Extent of employment is presented in two ways: (a) a contrast between part-time employment and no employment (k =10) and between full-time employment and no employment (k = 11) and (b) a full-time versus part-time contrast (women who were not employed were not included; k = 6). Six and four studies presented a full-time versus part-time contrast for externalizing and internalizing behaviors, respectively.

We found a significant effect of full-time employment when compared with no employment for overall behavior problems and for externalizing behaviors, indicating more behavior problems when employment was full-time than when there was no employment when analyzed across all early employment times (see Table 7); the same pattern was not evident for internalizing behaviors. There was no effect of part-time employment versus no employment and no significant effect of part-time employment when compared with full-time employment for overall behavioral problems or the individual externalizing or internalizing behaviors. These results were replicated when we used a single pooled estimate of the effect size for the NLSY studies in these analyses. The NLSY–low and NLSY–high analyses were not conducted for children's behavior problems because too few NLSY studies provided effects for extent of employment.

In an analysis not shown here, the effects of full-time versus no employment were compared with the effects of part-time versus no employment. We found no significant differences between full-time versus no employment compared with part-time versus no employment, $Q_{Bs}(1) = 2.36$, $p = .12$. When this contrast was restricted to employment in the first year of life, there were no significant differences between full-time versus no employment compared with part-time versus no employment for overall behavior problems or internalizing. However, there was a nearly significant difference for externalizing behaviors, $Q_{Bs}(1) = 3.53$, $p = .06$. Examination of the individual point estimates revealed that full-time employment in the first year of life was associated with significantly more externalizing behaviors relative to no employment in the first year of life ($r = .034$, CI [.011, .057], $p = .004$). The association between part-time employment and externalizing behaviors was negative but nonsignificant ($r = -.022$, CI [−.075, .032], $p = .43$).

Discussion

Although maternal employment has been normative in American society for several decades and the public has become more accepting in its attitudes and beliefs (Galinsky et al., 2008), the question of the advisability of maternal employment when children are infants or toddlers remains a lively topic of debate and research inquiry. Many individual studies have reported that maternal employment early in children's lives is associated with poorer performance on cognitive tests and more behavior problems (e.g., Baydar & Brooks-Gunn, 1991; Ruhm, 2004), but not all studies have reached this conclusion (e.g., Vandell & Ramanan, 1992). In the present meta-analysis, we attempted to resolve this discrepancy with a meta-analysis of studies that spanned 5 decades. In our systematic, quantitative analysis, we examined the magnitude and direction of the relationship between mothers' work outside the home during infancy and early childhood with children's achievement and internalizing/externalizing behaviors. In addition to examining main effects, we investigated moderators of these associations and revealed under what conditions and for which subgroups of children early maternal employment seems beneficial or not beneficial.

For the main analysis, maternal employment was operationalized as any employment versus no employment; also contrasted was full-time compared with part-time employment, and each of these was compared with no employment. We extracted statistics from studies that supplied data using maternal employment status or hours variables even when researchers included more complex ways to operationalize mothers' paid work outside the home. Examined were both cognitive (achievement) and behavioral (behavior problems) outcomes; previous research has been consistently mixed about whether early maternal employment is posi-

Table 7
Effect of Full- and Part-Time Early Employment on Behavior Problem Outcomes[a]

Behavior problem and employment for all studies	k	r	95% CI	Q (df)
Overall behavioral problems				
Full-time versus not employed	11	.027*	[−.003, .051]	14.63 (10)
Part-time versus not employed	10	−.001	[−.024, .022]	10.35 (9)
Part-time versus full-time	6	.002	[−.020, .025]	3.36 (5)
Externalizing				
Full-time versus not employed	10	.026*	[.003, .049]	12.66 (9)
Part-time versus not employed	9	−.002	[−.020, .016]	4.56 (8)
Part-time versus full-time	6	.003	[−.019, .026]	4.01 (5)
Internalizing[b]				
Full-time versus not employed	4	−.034	[−.112, .044]	9.28 (3)
Part-time versus not employed	4	−.098†	[−.217, .020]	16.87 (3)

Note. Positive rs indicate that children of employed mothers had more behavioral problems than children of mothers who were not employed or that children of full-time employed mothers had more behavioral problems than children of part-time employed mothers.
[a] There were too few National Longitudinal Survey of Youth (NLSY) studies to conduct NLSY–high versus NLSY–low or pooled NLSY analyses. [b] There were too few studies (k = 2) to examine part-time versus full-time differences in internalizing behaviors.
† $p < .10$. * $p < .05$.

tively or negatively associated with these outcomes (e.g., Baum, 2003; L. G. Burchinal & Rossman, 1961; Ruhm, 2004; Vandell & Ramanan, 1992). Proceeding as we did enabled us to address the key question, Is early maternal employment relevant for children's development? It also allowed us to test effects over a broad expanse of time.

Overall, the results of this meta-analysis indicate that early maternal employment per se is rarely associated with children's later outcomes. The overall analyses indicated few significant associations between employment for overall achievement and behavior problems, but when found, the main effects indicated beneficial associations between early employment and child outcomes. One of the two significant main effects of early maternal employment emerged for teacher ratings of achievement; early employment was associated with higher ratings of achievement. Although the effect was small in magnitude, it gains importance because teachers, a third party, were the source of information about the children's cognitive competence. Early maternal employment also was favorably associated with lower levels of internalizing behaviors. Taken together, then, the overall analyses suggested that early maternal employment is usually not associated with children's development, but when it is, the small effects are often in the direction of more favorable child outcomes.

Moderator analyses revealed that the socioeconomic context of early maternal employment and other sample characteristics must be taken into consideration to fully appreciate the connections between mothers' early paid work and children's development. Because studies have become more sophisticated over time in design and analysis, we contrasted adjusted and unadjusted effects (e.g., for child care, paternal employment)—which showed that unadjusted effects were associated with beneficial outcomes and adjusted outcomes were either not associated or were associated with negative outcomes—and tested whether year of publication mattered—it did not. By and large, moderator analyses indicated that early maternal employment was associated with beneficial child outcomes when families were at risk socioeconomically, particularly in the context of families with single parents and on welfare; these findings support the compensatory hypothesis of employment for these families (e.g., NICHD Early Child Care Research Network, 2003). In contrast, other analyses indicated that employment was associated with negative child outcomes when families were not at risk financially (i.e., when families were middle or upper-middle class); these findings support the lost-resources hypothesis for these types of families (e.g., NICHD Early Child Care Research Network, 2003). Timing of employment was also an important moderator, such that Year 1 employment was negatively associated with children's achievement, whereas later employment (Years 2 and 3) was positively associated with achievement. Other variables that emerged in individual studies, such as child sex and age, were not significant moderators in the meta-analysis.

Moderators

Several contextual moderator variables proved consequential for both achievement and behavior problem outcomes, notably family structure, adjusted versus unadjusted effects, and effects adjusted for child care versus effects not adjusted for child care. Several other moderator variables were important for either achievement or behavior problems. Achievement moderator analyses indicated that effects differed on the basis of welfare status, timing, and adjustment for concurrent employment characteristics. Behavior problem moderator analyses indicated that effects with maternal employment were moderated by source of information. The specific results of these moderator analyses are discussed in more detail in the following sections.

Importance of Family Structure

The family structure moderator analysis indicated that this social and contextual factor plays an important role in the association between early maternal employment and both achievement and behavior problems. In particular, early maternal employment was significantly associated with positive outcomes (i.e., increased achievement and decreased behavior problems) for majority one-parent samples. However, early maternal employment was associated with negative outcomes for other subgroups, namely with decreases in achievement for two-parent families and increases in behavior problems for samples with mixed one- and two-parent families. Early employment was associated with decreases in children's internalizing behavior for both samples with a majority of one- and two-parent families; however, this association was stronger for samples with a majority of one-parent families. Although previous studies produced mixed findings in terms of the importance of family structure for the association between employment and achievement (e.g., Brooks-Gunn et al., 2002; Gregg et al., 2005; Harvey, 1999; Ruhm, 2004), the results of this study are consistent with past findings that maternal employment has more negative associations with child outcomes in two-parent as compared with one-parent families (Brooks-Gunn et al., 2002; Ruhm, 2004).

Previous research has indicated that one-parent families are potentially more vulnerable to financial strain and its adverse correlates for children's achievement and behavior (Gutman, McLoyd, & Tokoyama, 2005; Jackson, Brooks-Gunn, Huang, & Glassman, 2000). The results of this meta-analysis suggest that early maternal employment in sole-provider families may bolster children's achievement and buffer against problem behaviors, perhaps because of the added financial security and health benefits that accompany employment, as well as improved food, clothing, and shelter because of increased income and the psychological importance of having a role model for achievement and responsible behavior. In contrast, early maternal employment may be detrimental for the behavior of children in two-parent families if the increases in family income do not offset the challenges introduced by maternal employment during children's early years of life. Important to examine are possible support systems for families that can facilitate management of work and parenting, including expanded paid leaves, good quality alternate care for young children, after-school program, and adequate supervision for adolescents (Smolensky & Gootman, 2003).

Importance of Welfare Status

Past research has indicated both theoretical and empirical reasons to expect that the associations between early maternal employment and children's outcomes may differ depending on the SES of the family (e.g., Bogenschneider & Steinberg, 1994; Desai

et al., 1989; Gregg et al., 2005; Han et al., 2001; Waldfogel et al., 2002). Research devoted to studying the effects of recent welfare changes, including the Family Support Act of 1988 and the Personal Responsibility and Work Opportunity Act in 1996, allowed us in the current meta-analysis to examine both SES and welfare status.

Indeed, early maternal employment was differentially associated with children's achievement (but not behavior problems) for welfare and nonwelfare samples; employment was associated with increases in achievement for welfare samples but was not associated with achievement in nonwelfare samples. However, early maternal employment was significantly associated with decreases in formal measures of achievement for middle- and upper-middle-class families. Similar to the explanation for the family structure moderator, the welfare status results suggest that the added financial security, reduced family stress, and increased learning opportunities as a result of paid employment may protect children in families receiving welfare. In addition, as with maternal employment in two-parent families, early employment for nonwelfare samples may instead be associated with decreases in achievement because of the financial threshold having been met, leaving open challenges and demands not compensated for by family income.

An important note is that the majority of welfare samples included in this meta-analysis were those receiving welfare rather than those that were part of mandated welfare-to-work employment. However, research has indicated that mandated employment (rather than voluntary employment) may be associated with more negative outcomes for children, particularly if it decreases family income (Children's Defense Fund, 2002); therefore, future studies should continue to explore this possibility.

Importance of Controlling for Background, Contextual, and Child Care Variables

Meta-analyses were conducted to examine the effects of adjusting for control variables versus not making these adjustments and to investigate the impact of controlling specifically for child care (typically, type of care), paternal employment, and concurrent employment characteristics compared with adjusting for effects of other variables. In keeping with past research suggesting that the inclusion of control variables can alter the size and direction of associations under investigation (Baum, 2004; Baydar & Brooks-Gunn, 1991; Heyns & Catsambis, 1986; Waldfogel et al., 2002), analyses indicated that associations were different depending on whether effect sizes were adjusted for contextual variables (e.g., maternal education, ethnicity, family income) or remained unadjusted.

In general, unadjusted effects were associated with more favorable child outcomes, including increases in achievement and decreases in behavior problems (although the moderator analysis was not significant, the point estimate was), whereas adjusted effects either were not associated with child outcomes (for overall behavior problems, externalizing behaviors, overall achievement, or IQ) or were associated with more negative outcomes, particularly significant decreases in scores on formal achievement tests. Overall, these findings indicate that adjustment for contextual variables changes the nature of the association between early maternal employment and children's outcomes and that adjustment for controls renders the effects of employment nonsignificant for most outcomes but produces negative associations for formal achievement tests. These divergent findings indicate that a snapshot of the "direct" effects suggests only that children benefit from maternal employment during infancy and early childhood. However, when the role of socioeconomic and contextual variables, such as family structure, income, parental education, and race/ethnicity, are taken into account, early employment is either not significant or negatively associated with children's later outcomes.

Analyses examining adjustment for child care or concurrent employment characteristics suggested that adjustment for these controls may change the associations between employment and both children's achievement and behavior problems. Although these moderator analyses were not significant (some nearly reached significance), most of the analyses suggested that more negative child outcomes were associated with adjusted effects that did not control for later employment characteristics (increased externalizing behaviors and decreased overall achievement, scores on formal achievement tests, and IQ) or child care (increased externalizing behaviors). In these analyses, effects adjusted for concurrent employment characteristics or child care were not significantly associated with child outcomes. However, effects adjusted for child care were significantly associated with decreases in IQ; effects not adjusted for child care were similar in magnitude but nonsignificant. These results suggest that adjustment for child care may reveal more negative effects of maternal employment and reinforce arguments that child care and maternal employment—although they are not synonymous—should be considered in concert (e.g., Benn, 1986; Harrison & Ungerer, 2002). Although illuminative, these results should be interpreted with caution because the moderator analysis was not significant and the effect sizes adjusting for and not adjusting for child care were similar in direction and magnitude.

We emphasize that we were unable to examine fully what moderator role specific dimensions of child care play because there were too few studies to stratify by type, intensity, and quality of child care. As such, we were unable to examine effects for high- and low-quality child care; however, prior research has predicted positive links between maternal employment and achievement under conditions of high-quality care and more negative associations when child care quality is poor (e.g., Peisner-Feinberg et al., 2001). Moderator analyses suggested that the associations between early maternal employment and children's development did not change significantly even after child care mode was taken into account. Indeed, the pattern of adjusted effects remained mostly similar when child care or paternal employment characteristics were included as control variables. Future research should continue to explore the role that child care quality, timing, and stability play in the association between maternal employment and children's development. Furthermore, paternal employment is important because it influences maternal choices about whether to work, how long to remain at home, and how much to work once returning. The current meta-analysis indicates that effects are similar regardless of whether researchers controlled for paternal employment; however, future research should more directly and fully examine the independent and joint effects of maternal and paternal employment on children's functioning.

In contrast, analyses examining whether effects were adjusted for characteristics of maternal employment concurrent with the outcome assessment revealed significant moderation for overall

achievement and significant point estimates for overall achievement, formal achievement tests, and IQ. Across the board, results suggested a pattern in which the effects of early maternal employment not adjusted for concurrent employment characteristics were associated with more negative child outcomes (i.e., decreases in achievement and increases in behavior problems); the effects of early employment adjusted for concurrent employment were never significant. Developmental and economic theories suggest that children's achievement and behavior may be more adversely affected by early maternal employment than maternal employment later in life because of sensitive periods in development (e.g., Rutter, 1979), patterns of behavior established early in life that are difficult to change later on (e.g., Bronfenbrenner, 1986), or cumulative learning in areas such as achievement (e.g., Rutter, 1979). However, the results of the current meta-analysis suggest that this may not be the case. Instead, the effects of early maternal employment may not be due to employment in infancy or early childhood but may instead be due to employment that continues throughout the child's life.

Timing of the Early Maternal Employment

The results of this moderator analysis support previous theoretical and empirical suggestions that employment during the first year is more detrimental than work during other points in infancy and childhood (Baydar & Brooks-Gunn, 1991; Belsky, 2001; Blau & Grossberg, 1992; Desai et al., 1989; Hill et al., 2005; Waldfogel et al., 2002). Examination of the point estimates indicated that work during Year 1 was negatively associated with achievement, work during Years 2 and 3 was positively associated with achievement, and work measured at other times (Years 1–3 and 3–6) was not significantly associated with children's achievement. In contrast, timing was not a significant moderator of the association between early maternal employment and behavior problems, suggesting that the effects of employment on internalizing and externalizing behaviors are similar regardless of when in infancy or early childhood they are measured.

Several studies (e.g., Baydar & Brooks-Gun, 1991; Berger, Hill, & Waldfogel, 2005; Blau & Grossberg, 1992; Brooks-Gunn et al., 2002; Han et al., 2001) separated Year 1 into smaller segments (e.g., quarters). The results from some studies suggested that the effects of maternal employment in Year 1 vary depending on the time during Year 1 employment was measured (e.g., Baydar & Brooks-Gunn, 1991; Brooks-Gunn et al., 2002; Han et al., 2001), indicating that a more nuanced measurement of employment during the first year may be necessary to understand the importance of timing in relation to externalizing behaviors. Alternatively, the age at which reentry occurs (rather than the timing of the employment measurement, as examined in this meta-analysis) may be more strongly associated with externalizing behaviors. However, too few studies provided data on reentry specifically for the current analyses to include it; more studies are needed that examine the importance of the timing of reentry to the labor force.

By parsing the measurement of early employment, this meta-analysis also revealed that employment measured during Years 2 and 3 is positively associated with children's achievement; this is consistent with previous research (e.g., Blau & Grossberg, 1992; Waldfogel et al., 2002). On the one hand, this finding raises the possibility that delaying the return to work until after the first year of life is beneficial for children's later achievement. It is also possible, on the other hand, that those mothers who can delay employment are able to do so because of greater family resources, which may lead to improvements in children's achievement rather than the delay in a return to work per se. Either way, this analysis suggests that researchers examining achievement-related outcomes should carefully consider the time in children's lives during which they measure early maternal employment, particularly because averaging employment over the first several years of life may suggest negligible effects of employment because work at different points is differentially associated with child development. In addition, these findings may have implications for policy regarding paid family leave and job protection. The results of this meta-analysis are compatible with the position that children may benefit if mothers are allowed to postpone a return to work until after the first year after birth (Committee on Family and Work Policies, 2003).

The findings discussed here relate to the time in the child's life when maternal employment was measured; we were not able to directly examine the time in the child's life when mothers returned to work. Researchers have investigated the effect of timing of return to work on child outcomes (e.g., Baydar & Brooks-Gunn, 1991; Belsky & Eggebeen, 1991; Berger, Hill, & Waldfogel, 2005; M. R. Burchinal, Ramey, Reid, & Jaccard, 1995; Desai et al., 1989; Gregg et al., 2005; Gregg, Washbrook, & the ALSPAC Study Team, 2003; Han et al., 2001; Hill et al., 2005; McCartney & Rosenthal, 1991; Ruhm, 2004; Symons, 1998; Youngblade, 2003); however, operationalizations across studies were too diverse to adequately meta-analyze. Future research should be aimed at further investigating, both individually and meta-analytically, the direct associations between when mothers return to work and children's outcomes. Outcomes in future meta-analytic syntheses might extend to security of child–parent attachment because this socioemotional outcome has been hotly debated in relation to maternal employment and child care (e.g., Belsky, 2001).

Importance of the Extent of Employment

Previous work has suggested contradictory evidence regarding whether the extent of employment matters in relation to child outcomes. There is some evidence that full-time employment is more strongly and negatively associated with child outcomes than part-time employment (Baum, 2003; Gregg et al., 2005; Ruhm, 2004), although not all research supports these findings (Baydar & Brooks-Gunn, 1991; Han et al., 2001). The results of the current meta-analysis indicate that the extent of employment moderates the associations between employment and children's behavior problems during the first year of life but not during toddlerhood and preschool. Consistent with past research (e.g., Brooks-Gunn et al., 2002; Gregg et al., 2005) was evidence that the extent of employment may matter during the first year of life, at least in relation to children's externalizing behaviors. During the first year, the analysis of full-time employment versus no employment compared with part-time employment versus no employment revealed a nearly significant difference and produced a significant point estimate for full-time employment compared with no employment. The point estimate indicated that full-time employment in the first year is associated with more externalizing behaviors. However, the effects of part-time employment were not different from the effects

of no employment. In addition, although the analysis of full-time employment versus no employment compared with part-time employment versus no employment was not significant for all time periods of employment, full-time employment was associated with significant increases in overall behavior problems and externalizing relative to no employment.

It is possible that early full-time employment is associated with more behavior problems for children because of child care correlates (e.g., the potential for "early, extensive, and continuous" [Belsky, 2001, p. 860] child care; see also Vandell & Corasaniti, 1990), many changes in alternate care arrangements, and placement in poor quality alternate care, correlates of maternal absence, such as decreased maternal contact and supervision, or more negative spillover from long days at work to family life. It is important to acknowledge that the extent of maternal employment is intimately tied to contextual and family variables, including SES and paternal work hours. Some mothers may work full-time, particularly in the first year of life, because they cannot afford to be employed part-time (see also Goldberg et al., 2008). However, labor force participation also runs high among well-educated married women (Juhn & Potter, 2006) for whom income may not be the primary motivation for employment. Full-time employment may be confounded with contextual and family characteristics that put children's behavior at risk. The confounding selection and family factors, combined with the large number of nonsignificant full-time versus part-time contrasts, indicates that it is unwise to conclude that full-time employment in and of itself is a risk factor for children. While remembering that early employment as a main effect was associated with both favorable achievement and behavioral outcomes, we should not overlook the possibility that intense and early work in conjunction with early and extended child care (Belsky, 2001) may pose risks for children's behavior. These findings also point to the need to consider both maternal employment and child care associations; although early maternal employment generates a need for alternate care, the timing, quantity, and reasons for maternal employment along with the timing, quantity, stability, type, and quality of child care need to be considered.

Importance of the Source of Information About Child Outcomes

Studies that examine child behavior problems rely on various sources of information about problem behaviors. For example, older children often report on their own internalizing or risky behaviors (e.g., Aughinbaugh & Gittleman, 2004; Lerner & Galambos, 1988), whereas parents and teachers often report on externalizing or younger children's internalizing behaviors (e.g., Auerbach et al., 1992; Borge & Melhuish, 1995; Nomaguchi, 2006; Youngblade, 2003); other studies rely on observer-rated problem behaviors like defiance or compliance (e.g., Barglow et al., 1998; Crockenberg & Littman, 1991). Therefore, it is possible that the association between early maternal employment and children's behavior problems depends on who reports the existence of behavior problems; for instance, there is evidence that self-reports of internalizing behaviors are more accurate than paternal reports (Achenbach, 1991). Indeed, the source of information about behavior problems moderated the association between early maternal employment and externalizing behaviors. The results indicated that employment was not associated with self-reported, parent-reported, or observer-rated externalizing. However, teacher reports of externalizing behaviors were significantly and positively associated with early maternal employment, such that teachers reported more behavior problems when mothers were employed in infancy or early childhood. In addition, there was a main effect of early maternal employment on achievement for teacher-reported achievement; in this case, employment was associated with increases in achievement.

This set of findings suggests that teachers have a unique perspective, perhaps because they observe behaviors at school that are different from those that other sources observe. It may be that children of employed mothers are particularly likely to act out in school settings, relative to the settings in which mothers and researchers observe children's behavior. It is also possible that evaluations by teachers are uniquely associated with children's outcomes because their reports do not suffer from bias to the same extent that mothers' reports do or that teachers have observed many more children than mothers and are therefore better at detecting behavioral and achievement differences among them. These analyses suggest that researchers should carefully consider from whom they obtain reports of achievement and behavior problems and that utilizing reports from teachers only or mothers only may yield associations that are not apparent when reports from other perspectives are utilized.

Importance of Other Moderators

Although this meta-analysis confirmed that the nature of the association between early maternal employment and children's outcomes depends on characteristics of both the sample and the study, there were several moderators that were not influential. For instance, effects for NLSY and non-NLSY studies were not different once we controlled for other study-level moderators (the bivariate analysis suggested that NLSY effects were smaller than non-NLSY effects), even though the NLSY studies differed in several ways from many of the other studies in the meta-analysis (e.g., sample size, racial/ethnic and SES composition). Similarly, associations did not depend on study quality, sex of the first author, or the publication year. Although the power to detect differences at the individual level of the moderator was reduced, the nonsignificance of these moderators suggests that the associations between early maternal employment and children's outcomes are not dependent on the characteristics of the individual studies; this strengthens claims about the external and internal validity of the observed associations.

Furthermore, the nonsignificance of the sample characteristics of SES (for all outcomes except IQ), child sex, and child age as moderators also suggests that there are some subgroups that are not differentially affected by early maternal employment. The point estimates for the different levels of these nonsignificant moderators were of similar magnitude and direction and were all very small (often negligible), suggesting that for the individual groups, there is a similar association between early maternal employment and children's achievement. However, because of theoretical and empirical indications that SES (e.g., Bogenschneider & Steinberg, 1994; Gregg et al., 2005), child sex (e.g., Brooks-Gunn et al., 2002; Waldfogel et al., 2002), and child age (e.g., Baum, 2003; Baydar & Brooks-Gunn, 1991; Harvey, 1999) are consequential in individual studies and in a meta-analysis of concurrent maternal

employment and achievement (Goldberg et al., 2008), future work should investigate the possibility suggested by previous work (Desai et al., 1989) that the interactions between these factors may influence the association between early maternal employment and children's development.

Early Versus Concurrent Maternal Employment

A recent meta-analysis (Goldberg et al., 2008) examined the sociocontextual moderators of the association between concurrent employment and children's achievement, allowing a comparison of whether early and concurrent employment are associated with achievement under different conditions and for different subgroups of children. That meta-analysis indicated that family structure was an important moderator and suggested positive effects of employment for majority one-parent samples. Therefore, it appears that, regardless of whether employment is during infancy and early childhood or later childhood and adolescence, family structure is an important factor in the association between that employment and children's achievement. However, adjusting for potential covariates appears to operate differently when considering early versus concurrent employment. The adjustment for control variables appears to be important only for early rather than concurrent employment (Goldberg et al., 2008). It is possible that socioeconomic and contextual indicators, such as family income, race/ethnicity, and family structure, play a larger role in the choice (or lack thereof) to work during infancy and early childhood than the choice to work later on. Therefore, controlling for these and other variables may make a smaller difference in the nature of the association between concurrent employment and achievement; however, adjustment does influence the direction of the association between children's outcomes and early maternal employment.

There were some moderators of the association between concurrent employment and achievement (Goldberg et al., 2008) that were not significant in this meta-analysis, including year of publication and child age/grade when achievement was measured. The association between early maternal employment and children's achievement may be less influenced by historic changes, such as increasing normality of maternal work or improvements in methodology; however, it is also possible that the variability in publication year is driving this finding. Although the range of published studies included were similar for this meta-analysis and the meta-analysis of concurrent employment (1961 to 2006 and 2010, respectively), studies in the latter were more evenly distributed across the publication years (Goldberg et al., 2008). Therefore, the discrepancy may be because the present meta-analysis of early maternal employment is based on a larger proportion of more recently published articles. In addition, employment may be negatively associated with achievement only when both are measured in middle and high school, perhaps because of the reduced parental supervision in families with employed mothers (Bronfenbrenner & Crouter, 1982; Montemayor & Clayton, 1983; Muller, 1995) or the need for more high-quality after-school programs for adolescents in middle and high school (Vandell, Pierce, & Dadisman, 2005).

The comparison of the early and concurrent meta-analyses suggests that both are associated with children's achievement for the same children under similar conditions. The findings also indicate that, in terms of achievement, infancy and early childhood are not periods that are any more critical than later childhood and adolescence in terms of the child's sensitivity to the environmental influence of maternal employment, despite some arguments that this might be the case (e.g., Bronfenbrenner, 1986; Rutter, 1979). This position is consistent with previous indications that early maternal employment is not more damaging for children's achievement (Parcel & Menaghan, 1994) or more consequential for children's academic development across childhood (Waldfogel et al., 2002) than concurrent employment.

Role of Publication Bias

Meta-analytic reviews need to be concerned with the potential problem of publication bias, in which the likelihood of a study being published is associated with the statistical significance of the effect size. The current meta-analysis evaluated the potential for publication bias by examining funnel plot symmetry and by using Egger's test to more objectively test for publication bias (Egger et al., 1997). There were suggestions of publication bias for a minority of comparisons; in these cases, we used a fixed effects trim-and-fill method (Duval, 2005; Sutton, 2005) to calculate the average, weighted effect size. Most of the conclusions about practical and statistical significance were the same whether or not the trim-and-fill procedure was used.

However, when conducted in the face of a nearly significant Egger's test, the trim-and-fill procedure yielded a very small negative association between employment and overall achievement. Therefore, most concerns about publication bias were mitigated, but this discrepancy in results suggests that publication bias may have been operating when all achievement outcomes were combined (although this finding should be interpreted with caution because of the nonsignificant nature of the Egger's test). However, the trim-and-fill adjusted effect size is not an estimate of true effect size (e.g., Anderson et al., 2010; Duval, 2005; Duval & Tweedie, 2000) and therefore should not be interpreted as indicating that maternal employment is associated with decreases in overall achievement. Instead, one can evaluate the nature of the discrepancy between the original effect size and the trim-and-fill adjusted effect size to determine how the potential publication bias is operating. In this case, the nature of this discrepancy indicates that publication bias may be operating to mask a very small negative effect in the analysis of all achievement outcomes combined.

Notably, publication bias is not the only possible cause of asymmetry in a funnel plot; another potential source of asymmetry is true heterogeneity (Sterne, Becker, & Egger, 2005). When there is true large heterogeneity in the effect sizes, the trim-and-fill procedure may adjust for publication bias when none is present (Sterne, Gavaghan, & Egger, 2000; Terrin, Schmid, Lau, & Olkin, 2003). Four individual outcomes with different effects sizes (ranging from nearly negative to significantly positive) were combined in the overall achievement analysis, suggesting that true heterogeneity among the overall achievement effect sizes may pose a plausible alternative explanation to the existence of publication bias.

Limitations

A limitation of the current meta-analysis is that the individual effect sizes, which were often small, were frequently based on a small number of studies and may have provided a less precise

estimate of the actual effect size. The significant meta-analytic findings often were based on small effect sizes. The practical importance of small effects is debatable, and some argue that small effects that affect a great many individuals—as is the case with maternal employment—are nonetheless important for society (e.g., Belsky, 2001; Dmitrieva, Steinberg, & Belsky, 2007). Therefore, the small size of the observed effects does not render them trivial in terms of their practical meaning.

Studies that examine the association between maternal employment and children's outcomes are by nature quasi-experimental; therefore, conclusions about causality are not possible. More complex causal mechanisms may be operating that could not be tested in the present meta-analysis. The further identification of mediators of this association will enhance researchers' understanding of the mechanisms by which early maternal employment may influence achievement and children's behavior. In addition, although the meta-analysis had excellent power to detect small effects, our power for testing moderators was reduced. However, many researchers (e.g., Desai et al., 1989) have argued that it is likely the interactions between employment and other characteristics (family income, child age, child gender) most strongly predict children's outcomes. Future research should continue to explore these interactions to best understand the ways in which maternal employment is important for children's development.

Because the current study was concerned with employment during the first 3 years of life (and included effects that extended across the first 6 years), studies were excluded that presented effect sizes only for the association between child care and children's outcomes. This decision was made because the overlap between early employment and the use of child care is strongest in the first year of life and lessens as children age (e.g. Belsky, 2001). However, there may have been studies for which the overlap between child care and maternal employment was large enough that it would have been appropriate to include it in our meta-analysis. Although the results of this study do not reveal a main effect between employment and externalizing behavior as has been found between child care and this outcome (e.g., NICHD Early Child Care Research Network, 2004; Vandell et al., 2010), our results align with the findings from the child care research in several other ways. Full-time employment in the first year of life was associated with the increases in externalizing behavior, which is similar to reports of early and extensive nonmaternal care linked to more externalizing behavior problems (Belsky, 2001; Vandell et al., 2010). Our results also are consistent with the findings from the child care research in terms of supporting a positive association with later cognitive and achievement outcomes (e.g., Peisner-Feinberg et al., 2001; Vandell et al., 2010). The meta-analytic results indicated that the positive or negative direction of associations between maternal employment in the first few years and later child development outcomes often varied by subgroup, a finding that parallels a number of child care studies (e.g., Desai et al., 1989; NICHD Early Child Care Research Network, 2003) but is discrepant with some reviews of this literature (e.g., Belsky, 2001). Future efforts should continue to be directed toward clarifying the complex interplay between maternal employment and child care.

The importance of employment intensity for both early and concurrent employment suggests that an examination of employment status per se may provide a limited picture of the association between maternal employment and children's achievement and behavior problems. The rising number of both employed and nonemployed women who would prefer to work part-time rather than full-time—67% of employed mothers would prefer to work part-time rather than full-time (Pew Research Center, 2007)—supports the idea that maternal attitudes about work, particularly preferred work arrangements or desire to work, may explain the differential associations of full- and part-time work with children's development. Therefore, a multifaceted view of employment that encompasses status, intensity, timing, and characteristics such as a desire to work or economic necessity will likely provide a better picture of how maternal work outside the home is associated with children's academic achievement and behavior.

Conclusion

Taken together, the results of these analyses suggest that maternal employment early in a child's life is not commonly associated with decreases in later achievement or increases in behavior problems. The associations between achievement and behavior problems and maternal employment are predominately nonsignificant, small even when significant, both positive and negative in direction, and moderated by both family and contextual variables. The moderator analyses highlight the necessity of considering the larger social and ecological context of maternal employment. Family structure and welfare status both significantly moderated the associations between maternal employment and achievement and/or behavior problems, and findings support the compensatory hypothesis of employment for at-risk families and the lost-resources hypothesis for low-risk families; the importance of adjusting for control variables also implies that early maternal employment cannot be understood without also considering family and background variables that are associated with work outside the home. Furthermore, the timing and extent of employment moderator analyses indicated that when and how much mothers work—aspects of work often influenced by social and ecological factors—influence the nature of the association between employment and children's outcomes. Employment in the first year of life, particularly full-time employment, was associated with more negative outcomes for children, whereas, somewhat later employment (Years 2 and 3) appeared to be advantageous for children's achievement. Therefore, to fully understand the association between maternal employment and children's development, researchers must consider what employment means to families and mothers, characteristics of employment beyond status, and likely social and cultural moderators.

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Received January 25, 2010
Revision received July 8, 2010
Accepted July 12, 2010 ■