Psychological Bulletin
2008, Vol. 134, No. 1, 77–108

0033-2909/08/$12.00 DOI: 10.1037/0033-2909.134.1.77

Maternal Employment and Children's Achievement in Context: A Meta-Analysis of Four Decades of Research

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This meta-analysis of 68 studies (770 effect sizes) used random effects models to examine whether children's achievement differed depending on whether their mothers were employed. Four achievement outcomes were emphasized: formal tests of achievement and intellectual functioning, grades, and teacher ratings of cognitive competence. When all employment was compared with nonemployment for combined and separate achievement outcomes without moderators, effects were nonsignificant. Small beneficial effects of part-time compared with full-time employment were apparent for all achievement outcomes combined and for each individual achievement outcome. Significant sample-level moderators of the associations between maternal employment and achievement for all outcomes combined included family structure, race/ethnicity, and socioeconomic status; associations were positive when samples were majority 1-parent families and mixed 1- and 2-parent families, racially/ethnically diverse or international in composition, and not middle–upper class. Analyses of child gender indicated more positive effects for girls. Children's age was a significant moderator for the outcome of intellectual functioning. The identification of sample-level moderators of the relationship between maternal employment and children's achievement highlights the importance of social context in understanding work–family linkages.

Keywords: maternal employment, meta-analysis, achievement, grades, intelligence

The decade of the 1980s witnessed a major demographic shift in U.S. labor force patterns. Participation in the labor force for married women with young children under 6 years of age became the majority arrangement during the middle of that decade (U.S. Census Bureau, 2002). Moreover, by 1985, more than half of married mothers with infants under 1 participated in the workforce (U.S. Census Bureau, 2002). In 2002, 50.8% of all women with infants under 1, 55.4% of women with children under 3, and 68.6% of women with children under 18 were employed in the civilian labor force. Against the backdrop of modal maternal employment, which historically has been even higher for Black American women than for White American women (U.S. Census Bureau, 2002), controversy persists over the consequences of mothers' paid work for children's development. An "underlying skepticism" lingers even today and implies that "maternal employment, even if the norm, is still not optimal" (Gottfried, Gottfried, & Bathurst, 2002, p. 209).

Surveys of public opinion reflect the nation's ambivalence about maternal employment. Paralleling the demographic shift in mothers' participation in the labor force, the tide of public opinion shifted from the 1970s to the 1980s. In 1977, slightly less than half of Americans (48.9%) agreed or strongly agreed with the statement "A working mother can establish just as warm and secure a relationship with her children as a mother who does not work" (Davis, Smith, & Marsden, 1999 [General Social Surveys]). By 1988, a majority of Americans (62.5%) endorsed that statement, and this endorsement held through the next decade (1998: 67.7%). Yet in both 1988 and 1994, most Americans also held the contradictory belief that when there is a child under school age, mothers should stay home rather than work for pay (Davis et al., 1999). This belief may have been rooted in the psychoanalytic underpinnings that permeated parenting advice in the middle of the last century. This *maternal deprivation* perspective (Gottfried et al., 2002) conveyed the sentiment that young children's cognitive, psychological, and emotional development would be harmed if the young child was separated from the mother and the mother was not present to provide continuous care for the child's physical and emotional needs (Bowlby, 1952; Fraiberg, 1977).

Research interest in maternal employment and families has spanned disciplines, with steady interest most notably from the fields of psychology, sociology, and economics. With the 1963 publication of the edited volume *The Employed Mother in America*, Nye and Hoffman awakened the social science community to the importance of this area of study. The lively interest in this controversial topic has not ebbed. Each subsequent decade boasts either seminal reviews (e.g., Hoffman, 1974, 1979, 1980), books on parental employment and families from scholars in a variety of disciplines (e.g., Barnett & Rivers, 1998; Moen, 2003; Voydanoff, 1987), the spawning of research institutes devoted to the study of work and family (e.g., the Berger Institute for Work, Family, and Children; Galinksy's Families and Work Institute), or special

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We are grateful for the help of Tracy Laulhere, Rachelle Strauss-Swan, Shelly Brown, and Meret Keller in the initial phases of the project.

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issues of journals devoted to work and family (e.g., a 2006 issue of the *American Behavioral Scientist*; Halpern & Riggio, 2006).

The current meta-analysis focuses on an issue in the work–family literature that has received a good deal of empirical attention, namely, the impact of maternal work on children's academic achievement. Although characteristics of fathers' employment have received attention (e.g., Hoffman & Youngblade, 1999; Parcel & Menaghan, 1994b), and fathers' work patterns and income impinge on maternal work, the scope of the current meta-analysis includes only maternal employment.

Over the years, research on maternal employment and children's achievement has been consistent only in producing mixed results. Null findings, beneficial associations, and negative associations have characterized this area of inquiry. For example, Burchinal and Rossman (1961) and Leibowitz (1977) found that there was no association between maternal employment and children's achievement. However, Hutner (1972) reported mostly no significant differences but found that when they occurred, achievement scores were higher among children whose mothers did not work compared with children whose mothers worked, and among children of mothers employed part time rather than full time. Later in that same decade, Cherry and Eaton (1977) found different associations depending on the aspect of achievement under study: Children with working mothers scored lower on the Stanford–Binet than children whose mothers did not work but scored higher in spelling and on a formal test of achievement than children with nonworking mothers.

Although the findings often vary within and across studies, what has become clear is that characteristics of the sample often influence associations between maternal employment and children's achievement. These sources of moderators, rather than only the "social address" of maternal employment (Bronfenbrenner & Crouter, 1982), must be considered when one evaluates the impact of mothers' employment on children's development.

Potential Moderators of Effect

With a more contextual approach to the study of maternal employment comes an increasing focus on characteristics of the sample that might alter the nature of the association between maternal employment and children's achievement. Particular emphasis has been given to race/ethnicity, child gender, family structure, and socioeconomic status (SES; e.g., Hoffman & Youngblade, 1999). Given changes in design and methods over the decades (e.g., the use of longitudinal designs, inclusion of control and moderator variables), the date of publication and study quality, including type of design, were included as potential moderators in the meta-analysis. Through examination of moderators, the meta-analysis is able to identify subgroups of children whose achievement is negatively or positively related to maternal employment.

Sample Characteristics

Before maternal employment became normative, social class and educational level were not similarly distributed in groups of employed and nonemployed mothers, often leading to unintentional confounding of maternal employment and SES in research on the effects of maternal employment on children's achievement (Beyer, 1995; Hoffman, 1984). When controlling for a variety of demographic variables, such as maternal education and income, findings from some studies indicate that maternal employment relates positively to child achievement outcomes (e.g., Blau & Grossberg, 1992); other findings indicate no association between maternal employment and achievement (e.g., Desai, Chase-Lansdale, & Michael, 1989), and still others report negative associations (e.g., Baum, 2003; Farel, 1980). It is important to note that the inclusion of demographic indicators as control variables can alter study outcomes. For example, Farel's (1980) findings that maternal employment was associated with children's lower academic achievement were attenuated by the inclusion of a number of variables that controlled for sample characteristics such as education, income, and race/ethnicity. Similarly, in a recent analysis of a national data set, Baum (2003) found that maternal income partially mitigated the negative effects of early maternal employment on cognitive outcomes.

Among welfare-eligible families and in working-class homes, the added income from maternal employment increases financial security; helps ensure children's basic requirements for food, clothing, and shelter are met; increases children's material resources and learning opportunities; and lessens family stress, all of which operate to benefit children's achievement (Beyer, 1995). For example, positive effects on reading and math scores were reported by Vandell and Ramanan (1992) in their study of maternal employment in low-income families. However, when maternal employment is not a financial necessity, the decreased maternal attention, supervision, and availability, as well as the possibility of alternative care settings that are less enriched than the home environment, may open the door for negative effects of maternal employment on achievement. Results of a large national study pointed to unsupervised time after school as the explanatory link between maternal employment and eighth graders' lower math achievement scores (Muller, 1995).

Many studies of maternal employment and achievement, particularly those that were conducted years ago, utilized small samples of largely White families or had racially/ethnically diverse samples but did not analyze data separately by racial/ethnic group. A number of more recent studies, such as those using the National Longitudinal Survey of Youth (NLSY), have stratified results by race/ethnicity. For example, in an analysis of NLSY data, Han, Waldfogel, and Brooks-Gunn (2001) found negative effects of maternal employment for the cognitive functioning of non-Hispanic White children but not for Black children. Expectations have been that Black families would demonstrate more positive effects of maternal employment on child outcomes. Explanations include the more egalitarian gender roles and long-term normative status of maternal work in these families (McLoyd, 1993). Moreover, variations in amount of annual employment and typical annual earnings for Black and White workers have implications for the need for maternal employment (Johnson et al., 2003). However, as a moderator, race/ethnicity has been equivocal: In the main, "the question of whether maternal employment effects are influenced by race/ethnicity has not yet been answered" (Hoffman & Youngblade, 1999, p. 26).

Although often confounded with poverty status and race/ethnicity, family structure, too, has been examined in relation to maternal employment and achievement. In a frequently cited study with low-income Black participants, Cherry and Eaton (1977) found maternal employment to be advantageous, but it was most

advantageous for cognitive outcomes in children in two-parent as compared with single-parent families. In a later review of this study and others, Hoffman and Youngblade (1999) concluded that the extant data do not indicate a clear pattern of differences between the effects of maternal employment in one- and two-parent families. Because of the ambiguous state of the findings, the current meta-analysis includes a number of demographic variables that reflect sample characteristics, such as SES, race/ethnicity, and family structure, and examines them as potential moderators of the associations between maternal employment and children's achievement.

Other important sample characteristics include attributes of children, particularly their age and gender. Age of child has been associated with the positive or negative direction of associations between maternal employment and achievement. Maternal employment when children are young infants, for example, has been linked to negative cognitive outcomes (Brooks-Gunn, Han, & Waldfogel, 2002). Younger children may be negatively affected by extended maternal absence due to employment unless it is offset by high-quality nonmaternal care; by later childhood and adolescence, the primacy of family influence may be supplanted in part by the influence of schools and peers (Baum, 2004) and the nature of out-of-school care experiences (Coley, Morris, & Hernandez, 2004). During later childhood and adolescence, decreased maternal supervision may increase children's (especially boys') risk of exposure to negative peer influences and involvement in undesirable activities (Crouter, McDermid, McHale, & Perry-Jenkins, 1990; Montemayor & Clayton, 1983). The independence granting and achievement emphasizing that characterize parenting in some families with employed mothers are associated with greater achievement performance by children (e.g., Alessandri, 1992). Because of its varying associations with the links between maternal employment and achievement, an objective of this meta-analysis is to elucidate the potential moderating role played by children's age.

From the earliest reviews of maternal employment and children's achievement-related development emerged discussion of child gender differences, with indications of positive consequences for girls and negative outcomes for boys. Why should favorable outcomes accrue especially for girls? Some explanations include the observations that the employed mother provides a role model of achievement for daughters, daughters with employed mothers likely benefit from greater independence training, both parents may endorse more egalitarian gender role attitudes, and paternal involvement may be greater—all of which serve to boost girls' self-confidence and competence (Hoffman, 1979, 1980). Alternatively, maternal employment may afford sons too much independence and inadequate supervision and guidance. Negative consequences seem to be more pronounced for boys, whose active, independence-seeking behaviors may require more supervision and guidance as compared with girls (Beyer, 1995; Hoffman, 1984). In a sample of families from rural and small communities, Crouter et al. (1990) found that when children were unsupervised, it was the boys with employed mothers whose grades and behavior were negatively affected. The bifurcated consequences of maternal employment for sons and daughters have resonated in research in recent decades (e.g., Goldberg, Greenberger, & Nagel, 1996; Hoffman & Youngblade, 1999), although not all studies have found gender differences (e.g., Baydar & Brooks-Gunn, 1991; Goldberg & Easterbrooks, 1988; Gottfried & Gottfried, 1988; Lerner & Galambos, 1988; D. D. Rosenthal & Hansen, 1981).

On the basis of qualitative reviews, researchers have surmised that some gender differences depend on socioeconomic class. In her 1984 review of maternal employment and the young child, Hoffman observed that "there is a recurring finding that middle-class sons of employed mothers show lower academic performance in grade school and sometimes lower IQs. This finding does not occur among lower class boys" (Hoffman, 1984, p. 116). Empirical support for this position comes from a number of studies over the years (e.g., Banducci, 1967; Cherry & Eaton, 1977; Desai et al., 1989; Gold & Andres, 1978b, 1978c; Rees & Palmer, 1970) that link maternal employment to negative consequences for the development of sons in middle-class and high-income homes. However, interactive effects between gender and social class are not always found (e.g., Greenstein, 1995; Horwood & Fergusson, 1999). In the current meta-analysis, both social class and child gender are examined as potential moderators of the effects of maternal employment on children's achievement.

The amount of time mothers spend at work—an index of intensity of employment—has emerged as an important feature to consider when examining the association between maternal employment and children's achievement. Findings using this index are mixed, with some studies reporting that children of mothers who worked full time reached a lower level of academic achievement than children of mothers who worked part time (Hutner, 1972; Moorehouse, 1991) and other studies indicating that neither part-time nor full-time maternal work status was significantly related to children's achievement (Leibowitz, 1977; D. D. Rosenthal & Hansen, 1981). Yet other research has pointed to accrued benefits for children's achievement as maternal employment increases in intensity. In an early test of this issue, Woods (1972) found that children of full-time employed mothers attained higher levels of academic achievement than children of part-time employed mothers. In contrast, Parcel and Menaghan (1990) reported that overtime work had a negative association with achievement relative to part-time and full-time employment. Illustrating the complexity of work intensity results, Baum (2003) found that a pattern of maternal work at more than 35 hr/week was associated with children's lower scores on cognitive measures in the 1st year of life but higher scores in the 2nd and 3rd years. In light of these mixed findings about the importance of the intensity of maternal employment, contrasts between full-time and part-time employment are examined in the current meta-analysis.

The timing of maternal employment also has received research attention, with some researchers reporting negative effects of early maternal employment for children's verbal abilities and formal achievement (e.g., Baum, 2003; Baydar & Brooks-Gunn, 1991; Ruhm, 2004). Negative consequences of early maternal employment might accrue because of the reduced quantity of maternal time available to the young child and the risk of poor quality nonmaternal child-care arrangements, but these negative results of early employment have not been consistently found (see Baum, 2003). When there is a fit between maternal work status and work preference, more positive effects of early maternal employment may be apparent. On the other hand, if nonemployed mothers would prefer to be working, they may become depressed and withdrawn and their parenting behaviors may be compromised (Hock & DeMeis, 1990; Parcel & Menaghan, 1994b). Whether

positive effects of early maternal employment emerge also may vary by type of alternative, nonmaternal care (Baydar & Brooks-Gunn, 1991; Waldfogel, Han, & Brooks-Gunn, 2002).

Examining the timing, intensity, and continuity of maternal employment, Harvey (1999) reported minimal effects of maternal employment on measures of cognitive development. Delayed effects of early maternal employment have been reported by Han et al. (2001) and Waldfogel et al. (2002) in their analyses of large, nationally representative data sets. Early return to work coupled with high work-hour intensity has been associated with lower cognitive performance (Brooks-Gunn et al., 2002). Other researchers have suggested that maternal employment later in development may be more consequential than early employment because of the importance of increased family income on the child's social and physical environment and because of the opportunities for older children to see their mothers as role models (see Baum, 2004). The timing of mothers' work in relation to child outcomes—early in the child's life or concurrent with the later assessment of achievement—is included as a potential moderator in this meta-analysis.

Empirical research on the effects of varied timing of maternal employment on achievement and other cognitive measures has produced mixed results that depend sometimes on the age of the child. For example, stronger, negative effects for concurrent maternal employment and achievement were reported by Baum (2004) for children in the adolescent years, and stronger, negative effects for early timing were found by Ruhm (2004) for the achievement of 5- to 6-year-old children.

Maternal employment often necessitates children's participation in regular, nonmaternal care or, when older, self care. The effects of early child care on children's development have been examined as a main effect and as a moderator and control variable (e.g., Brooks-Gunn et al., 2002; NICHD Early Child Care Research Network, 2002), as have the effects of after-school care on school-age children (e.g., Vandell & Ramanan, 1991). For example, Brooks-Gunn et al. (2002) found that a negative association between maternal employment and children's achievement remained when quality of child care was controlled. The effects of after-school care on school-age children have been examined as well; among children with employed mothers, the quality of children's relationships with parents was more strongly associated with cognitive and social outcomes than with the type of nonmaternal after-school care they received (Vandell & Ramanan, 1991). Researchers have been unanimous in their call for attention to the type, quality, and stability of child care, although not all studies have included these parameters. In this meta-analysis, we indicate whether the effects of child care were controlled in studies that examined maternal employment and achievement.

Study Characteristics

A number of study characteristics were examined as potential moderators. As the meta-analysis spans four decades and major demographic shifts in maternal labor force participation, year of publication, although not a perfect indicator of the time of data collection, was tested as a moderator of the association between maternal employment and child achievement. As is common in meta-analytic reviews on a gender sensitive topic, gender of first author also was tested as a study-level moderator (e.g., Eagly, 1987).

There are many proxies for study quality that often are incorporated as potential moderators in meta-analytic reviews. Three important dimensions of study quality that varied widely across the included studies are the source of the sample, type of research design, and quality of the publication outlet. The potential moderating effects of these indicators of study quality were included.

Because the NLSY became widely accessible, quite a number of researchers have utilized this large, diverse sample to study maternal employment in relation to children's development. The NLSY data set contains a nationally representative study of U.S. residents born between January 1, 1957, and December 31, 1964, with deliberate oversampling of Blacks, Hispanics, and economically disadvantaged Whites. Participants have been surveyed repeatedly since 1979, and data on the children of the original NLSY participants have been collected at 2-year intervals beginning in 1986. Details about this data set and the unique research opportunities that it affords are discussed in a number of publications, notably Baum (2003), Chase-Lansdale, Mott, Brooks-Gunn, and Phillips (1991), and Ruhm (2004). Individual publications using the NLSY tend to report negative effects of early, 1st-year maternal employment on children's later cognitive outcomes (e.g., Baydar & Brooks-Gunn, 1991; Ruhm, 2004), but not all NLSY studies support this conclusion (e.g., Harvey, 1999). Most NLSY studies have found small, positive effects of working in the child's 2nd and 3rd years of life (e.g., Han et al., 2001; Waldfogel et al., 2002), but again, there is not consensus (e.g., Ruhm, 2004). Despite the common source, analyses with the NLSY data have led to varying conclusions, reflecting differences in the subsets of the NLSY sample selected for analyses, measures of maternal employment, child outcomes, and the choice of control variables. Because a fair number of the studies included in this meta-analysis relied on the NLSY database, NLSY status was tested as a moderator.

Measures of Achievement

The intent of this analysis is to examine under what conditions and for which subgroups children's achievement is enhanced or compromised by maternal employment. Academic achievement is operationalized to capture widely used indices of achievement: formal achievement tests, school grades, formal tests of intellectual functioning, and teacher ratings of cognitive abilities.

The goal of this meta-analysis, then, is to take stock of 45 years of research and examine the body of evidence to ascertain the direction and magnitude of the association between maternal employment and children's achievement and to examine the potential impact of both sample- and study-level moderators.

Method

Literature Searches

One hundred thirteen published and unpublished studies were identified through searches of the literature. The majority of the studies were identified through broad computerized database searches of PsycINFO, Social Sciences Index, and ERIC, conducted through 2005. The keywords entered, in various combinations, were *maternal*, *mother(s)*, *parental*, *employment*, *work*, *children('s)*, *boy(s)*, *girl(s)*, *achievement*, *academic*, *cognitive*, *cognition*, and *school*. Additionally, the reference lists of retrieved

articles, as well as review articles and chapters, were searched manually for relevant articles and chapters. Our own files also were reviewed for preprints, unpublished manuscripts, working papers, conference abstracts, and papers. A handful of relevant studies were identified from the proceedings of national conferences on child development (e.g., the Society for Research on Child Development). Published versions of working papers and conference papers were sought through author searches in computerized databases.

Inclusion and Exclusion Criteria

The first selection criterion was that the studies had to test the relationship between maternal employment and children's cognitive or academic achievement. Maternal employment was defined as the mother having been employed either concurrently with the achievement testing or earlier in the child's life. Studies were included if maternal employment was assessed in terms of status (e.g., employed, not employed; full time, part time) or number of weekly work hours. In the overall analysis, achievement was defined broadly to include children's performance on formal tests of cognitive or intellectual development, by academic measures (e.g., school grades), teacher ratings of cognitive competence, or academic rank.

The second selection criterion was that the studies must have been published between 1960 and 2005. The year 1960 was established as the starting inclusion point because little or no research on the effect of maternal employment on child development was conducted prior to this year. Some studies were excluded upon closer inspection if they did not actually operationalize the maternal employment or child achievement measures according to inclusionary criteria. For example, studies were excluded if exclusive mothering or job characteristics such as autonomy or employment stability or timing of entry or reentry into the labor force, rather than maternal employment status or hours, were the focal measure of maternal employment. Studies that did not identify a clear reference group for maternal employment also were not included. Similarly, studies were excluded if dependent measures did not extend beyond task motivation or parental perceptions of child behavior to include grades or standard measures of cognitive, intellectual, or academic achievement. However, studies that were not designed explicitly to examine maternal employment comparisons were retained if independent tests of maternal employment status or hours were included. For example, a study of day care and children's achievement that also reported results for maternal work status and children's achievement would be retained.

Published, peer-reviewed versions of working papers and book chapters were used when the former contained redundant results or less data than the published journal article. Studies were excluded when the information provided in the manuscript was insufficient to calculate a measure of effect size and the authors could not be contacted or did not respond to our queries. In all, 45 of the 113 studies retrieved were excluded for the aforementioned reasons.

Final Sample

A total of 68 studies met criteria for inclusion in the final meta-analysis. The 57 studies that presented the effects of concurrent employment versus nonemployment were used in the overall analysis; another 6 of the 68 studies assessed only the effect of early employment. Sixteen of the 68 studies provided information on the extent of employment, comparing children of full-time versus part-time employed mothers. The aggregate sample size across all 68 studies was 178,323; sample sizes for individual studies ranged from 30 to 100,000. Some sample sizes were not directly provided and were inferred from other information provided. The sample size of one outlying study (Anderson, Mead, & Sullivan, 1986; $n = 100{,}000$) was winsorized (Lipsey & Wilson, 2001) to the 95th percentile ($n = 4{,}924$) of the sample size distribution for the $k = 68$ studies; this resulted in an effective final sample size of 83,247 children.

Table 1 provides summaries of the characteristics of the samples, measures, moderators, and outcomes of each of the 68 studies identified for potential use in the meta-analysis. The overall analysis focuses on the concurrent effects of maternal employment; the early effects were used only in the timing of maternal employment moderator analysis. The concurrent effect sizes are presented in Table 1 for the studies that included both early and concurrent effects.

Coding of Study Variables

Most of the studies were initially identified, reviewed, and coded by several graduate students with training and supervision from the lead author. These articles and the coded summaries were subsequently reviewed by the authors and project team for completeness and accuracy. Examples of coding categories are maternal employment status or hours, achievement outcome, children's age or grade, and gender of first author. Reliability, calculated as percentage of agreement between the initial and subsequent coding, exceeded 90%. Additional studies that postdated the initial searches were identified by the project team and coded by consensus.

Maternal Employment

Maternal employment coding depended on the data provided in each study. Categorical distinctions were any employment (full- or part-time employment), employed full time (working at or more than 30 weekly hours), employed part time (working up to 30 weekly hours), or not employed. The effect for a continuous hours of employment variable that included zero hours was treated as an employment versus nonemployment contrast. When provided, authors' criteria for full-time and part-time categories were used. If authors differentiated overtime from full-time employment, only full-time data were used. "Intermittent employment" categories, referring to mothers moving in and out of the labor force, were not used.

Children's Achievement

Four categories of child achievement outcomes were included in the overall meta-analysis and examined separately: (a) formal tests of achievement; (b) academic grades; (c) formal intelligence tests; and (d) teacher ratings of cognitive abilities. One study, which was included only in the overall meta-analysis, examined the outcome of academic rank. Formal tests of achievement included measures

(*text continues on page 86*)

Table 1
Independent Samples Included in the Meta-Analysis of Maternal Employment and Children's Achievement: Study and Sample Characteristics

Author	Sample size range[a]	Effect size (r)[b]	Publication source	Measure of achievement[c]	Employment type[d]	NLSY	Study quality		
							Research design[e]	Sample source[f]	Impact score
Alessandri (1992)	101–300	.591	Journal	GPA	FT/NE, PT/NE, FT/PT	N	C	1	1.75
Anderson et al. (1986)	>2,000[1]	.419	Working paper	Ach	EMP/NE	N	C	2	NA
Armistead et al. (1990)	≤100	.037	Journal	GPA, teacher ratings	EMP/NE	N	C	1	0.87
Auerbach et al. (1992)	301–700	.079	Journal	IQ, teacher ratings	EMP/NE	N	C, R	2	1.79
Banducci (1967)	>2,000	.026	Journal	GPA, Ach	FT/NE	N	C	3	NA
Baum (2003)	701–2,000	.006	Journal	Ach, IQ	EMP/NE	Y	L	3	1.28
Baum (2004)	701–2,000	−.050	Journal	GPA	EMP/NE	Y	L	3	0.80
Baydar & Brooks-Gunn (1991)	301–700	−.131	Journal	IQ	EMP/NE, PT	Y	L	3	3.42
Blau & Grossberg (1992)	701–2,000	−.105	Journal	IQ	EMP/NE	Y	L	3	1.52
Bogenschneider & Steinberg (1994)	>2,000	−.052	Journal	GPA	PT/NE, FT/NE, PT/FT	N	C, R	2	1.22
Brooks-Gunn et al. (2001)	301–700	.180	Journal	IQ	EMP/NE	N	L	2	NA
Brooks-Gunn et al. (2002)	701–2,000	.023	Journal	Ach, IQ	EMP/NE, FT/NE, PT/NE	N	L	3	3.04
Brutsaert (1998)	700–2,000	.095	Journal	GPA	EMP/NE	N	C	3	0.39
Burchinal & Rossman (1961)	700–2,000	−.071	Journal	Ach, IQ, GPA	EMP/NE	N	C, R	2	1.35
Cherry & Eaton (1977)	101–300	.140	Journal	Ach	EMP/NE	N	C	2	3.04
Desai et al. (1989)	301–700	.049	Journal	IQ	EMP/NE	Y	L	3	2.41
Farel (1980)	301–700	−.053	Journal	Ach, IQ	EMP/NE	N	C	2	3.04
Gold & Andres (1978a)	101–300	.000	Journal	GPA	FT	N	C	2	NA
Gold & Andres (1978b)	101–300	−.056	Journal	Ach	FT/NE	N	C	2	3.04
Gold & Andres (1978c)	≤100	−.194	Journal	IQ	FT/NE	N	C	2	NA
Gold et al. (1979)	≤100	.036	Journal	IQ	FT/NE	N	C	2	NA
Goldberg & Easterbrooks (1988)	≤100	.193	Book chapter	IQ	EMP/NE	N	L, C	1	NA
Goldberg et al. (1996)	101–300	−.015	Journal	Ach, GPA	EMP, FT/NE, PT/NE, FT/PT	N	C	1	3.04
Gottfried et al. (1988)	101–300	.062	Book chapter	Ach, IQ, teacher ratings	EMP/NE	N	L, C	2	NA
Greenstein (1995)	>2,000	.001	Journal	IQ	FT/NE, PT/NE	Y	L	3	0.80
Gregg et al. (2005)	>2,000	−.006	Journal	Ach	FT/NE, PT/NE, FT/PT	N	L	3	1.44
Han et al. (2001)	301–700	.017	Journal	Ach, IQ	EMP/NE, FT/PT	Y	L	3	1.35
Harvey (1999)	>2,000	.013	Journal	Ach, IQ	EMP/NE	Y	L	3	3.42
Heyns & Catsambis (1986)	>2,000	−.060	Journal	Ach	FT/NE, PT/NE	N	C	3	1.22
Hill et al. (2005)	701–2,000	−.038	Journal	Ach, IQ	FT/NE, PT/NE, FT/PT	Y	L	3	3.42
Hoffman (1961)	301–700	−.123	Journal	Teacher ratings	EMP/NE	N	C	2	3.04
Hoffman & Youngblade (1999)	101–300	.221	Book	Ach	EMP/NE, FT/NE, PT/NE, PT/FT	N	C	2	NA

Gender of first author	Early (E) or concurrent (C) emp.	SES[g]	Race/ethnicity[h]	Analyses presented sep. by gender[i]	Age/grade[j]	Family structure[k]	Adjusted or unadjusted effects presented	Adjusted for child care
M	C	W/LM	Diverse	Y	2	1 parent	Unadjusted	N
F	C	Mixed	Diverse	N	3	Not specified	Unadjusted	N
F	C	M/U	Not specified	Y	3	2 parent	Adjusted	N
F	E, C	Mixed	International	Y	2	Mixed	Adjusted, unadjusted	N
M	C	W/LM, M/U	Not specified	Y	3	2 parent	Unadjusted	N
M	E, C	Mixed	Diverse	N	1, 2	Mixed	Adjusted	Y
M	E, C	W/LM	Diverse	Y	3	Mixed	Adjusted, unadjusted	N
F	E, C	W/LM	White	N	1	Mixed	Adjusted, unadjusted	N
F	E, C	Mixed	Diverse	N	1	Mixed	Adjusted	N
F	E, C	W/LM, M/U	White	Y	3	2 parent	Adjusted	N
F	C	W/LM	Diverse, Black	Y	1	Mixed	Adjusted	N
F	E, C	M/U	White	N	1	1 parent, 2 parent	Adjusted, unadjusted	N, Y
M	C	Mixed	International	N	2	2 parent	Adjusted	N
M	E, C	Mixed	White	Y	3	2 parent	Adjusted, unadjusted	N
F	C	W/LM	Black	N	2	Mixed	Adjusted	N
F	E	Mixed	Diverse	Y	1	Mixed	Unadjusted	N
F	C	Mixed	Diverse	N	2	Not specified	Adjusted, unadjusted	N
F	C	W/LM, M/U	International	Y	3	2 parent	Unadjusted	N
F	C	W/LM, M/U	International	Y	2	2 parent	Unadjusted	N
F	C	M/U	International	Y	1	2 parent	Unadjusted	N
F	C	M/U	International	Y	1	2 parent	Unadjusted	N
F	E, C	M/U	White	N	2	2 parent	Adjusted	N
F	C	M/U	White	Y	2	2 parent	Adjusted	N
F	E, C	M/U	White	N	1, 2	2 parent	Adjusted	N
M	C	Mixed	White, Black, Hispanic	Y	1	Mixed	Adjusted	N
M	E	Mixed	International	N	1, 2	2 parent	Adjusted, unadjusted	N, Y
F	E, C	Mixed	White, Black	Y	1, 2	Mixed	Adjusted	Y
F	E, C	Mixed	Diverse	N	1, 2	Mixed	Adjusted, unadjusted	N
F	E, C	Mixed	White	N	3	2 parent	Adjusted, unadjusted	N
F	E	Mixed	Diverse	N	1, 2	Mixed	Adjusted	N
F	C	Mixed	White	N	2	Not specified	Unadjusted	N
F	C	Mixed	Diverse	Y	2	1 parent, 2 parent	Adjusted, unadjusted	N

(Table continues)

Table 1 (*continued*)

Author	Sample size range[a]	Effect size (r)[b]	Publication source	Measure of achievement[c]	Employment type[d]	NLSY	Study quality: Research design[e]	Study quality: Sample source[f]	Study quality: Impact score
Horwood & Fergusson (1999)	701–2,000	.098	Journal	Ach	FT/NE, PT/NE, FT/PT	N	L	3	3.93
Howes (1988)	≤100	.293	Journal	Teacher ratings	EMP/NE	N	L	2	3.42
Huston & Aronson (2005)	701–2,000	.090	Journal	Ach, IQ	EMP/NE	N	L	3	3.04
Hutner (1972)	>2,000	−.239	Journal	Ach, IQ	FT/NE, PT/NE, PT/FT	N	C	2	0.53
Jackson (2003)	101–300	.122	Journal	Ach	EMP/NE	N	L	3	1.92
Jackson & Schienes (2005)	101–300	.040	Journal	Teacher ratings	EMP/NE	N	L	3	0.76
Jacobson & Crockett (2000)	301–700	.088	Journal	GPA	EMP/NE	N	C	1	NA
Jones et al. (1967)	≤100	.142	Journal	Ach	EMP/NE	N	C	2	NA
Kiedel (1970)	301–700	−.110	Journal	GPA	EMP/NE	N	C	2	.69
Leibowitz (1977)	701–2,000	−.007	Journal	IQ	FT/NE, PT/NE	N	C	3	1.07
McGroder et al. (2005)	701–2,000	−.010	Journal	Ach	EMP/NE	N	L	3	NA
Menaghan et al. (1997)	>2,000	−.046	Journal	Low academic rank	EMP/NE	Y	C	3	2.57
Milne et al. (1986)	>2,000	−.065	Journal	Ach	EMP/NE, FT/NE, PT/NE	N	C	3	1.22
Moorehouse (1991)	101–300	.026	Journal	Teacher ratings	FT/NE, FT/PT	N	L	3	3.42
Muller (1995)	>2,000	.001	Journal	Ach, GPA	FT/NE, PT/NE, FT/PT	N	L	3	1.35
Nelson (1969)	301–700	.032	Journal	GPA	FT/NE, PT/NE/PT/FT	N	C	2	.38
Nolan (1963)	101–300	.171	Book chapter	Teacher ratings	EMP/NE	N	C	2	NA
Parcel & Menaghan (1990)	701–2,000	.052	Journal	IQ	EMP/NE, PT, FT	Y	L	3	1.06
Parcel & Menaghan (1994a)	301–700	−.018	Journal	IQ	EMP/NE, PT/FT	Y	L	3	3.62
Parcel & Menaghan (1994b)	701–2,000	−.028	Book chapter	Ach, IQ	EMP, PT/FT, NE	Y	L	3	NA
Parcel et al. (1996)	701–2,000	−.017	Journal	Ach	EMP/NE, PT/FT	Y	L	3	0.71
Paulson (1996)	101–300	.141	Journal	GPA	EMP/NE	N	C	2	0.69
Rees & Palmer (1970)	101–300	−.186	Monograph	IQ	EMP/NE	N	L	2	3.42
Ricciuti (1999)	701–2,000	.099	Journal	Ach	EMP/NE	Y	L	3	1.55
Rosenthal & Hansen (1981)	301–700	.005	Journal	GPA	FT/NE	N	C	2	0.73
Roy (1961)	101–300	−.059	Journal	GPA	EMP/NE	N	C	2	1.35
Ruhm (2004)	>2,000	.056	Working paper/ journal	Ach, IQ	EMP/NE, FT/NE, PT/NE, PT/FT	Y	L	3	1.07
Schachter (1981)	≤100	−.128	Journal	Ach, IQ	FT/NE	N	C	1	3.04
J. R. Smith et al. (2000)	701–2,000	.054	Journal	Ach, IQ	EMP/NE	Y	L	3	1.35
Stafford (1987)	≤100	−.401	Journal	Teacher ratings	EMP	N	L	3	1.81
Vandell & Ramanan (1992)	101–300	.079	Journal	Ach, IQ	EMP/NE	Y	L	3	3.04
Waldfogel et al. (2002)	701–2,000	−.015	Journal	Ach, IQ	EMP/NE, FT/NE, PT/NE	Y	L	3	2.41
Weinraub et al. (1990)	≤100	−.396	Book chapter	IQ	FT/NE	N	C	1	NA

Gender of first author	Early (E) or concurrent (C) emp.	SES[g]	Race/ethnicity[h]	Analyses presented sep. by gender[i]	Age/grade[j]	Family structure[k]	Adjusted or unadjusted effects presented	Adjusted for child care
M	C	Mixed	International	Y	2, 3	Mixed	Adjusted, unadjusted	N
F	C	Mixed	Diverse	Y	2	Mixed	Unadjusted	N
F	E	Mixed	White	N	3	Mixed	Unadjusted	N
F	C	W/LM, M/U, Mixed	White	N	2	Not specified	Unadjusted	N
F	C	W/LM	Black	N	1	1 parent	Unadjusted	N
F	C	W/LM	Black	N	3	1 parent	Adjusted, unadjusted	N
F	C	W/LM	White	N	1	Mixed	Adjusted	N
M	C	M/U	Not specified	N	2	Not specified	Adjusted	N
M	C	Not reported	Not specified	N	2, 3	Not specified	Unadjusted	N
F	C	W/LM	Diverse	N	2	Mixed	Adjusted	Y
F	C	W/LM	Black	N	3	1 parent	Adjusted, unadjusted	N
F	C	Mixed	Diverse	N	3	Mixed	Adjusted	N
F	C	M/U	White, Black	N	2, 3	1 parent, 2 parent	Adjusted	N
F	C	Mixed	White	N	1	2 parent	Adjusted	N
F	C	Mixed	Diverse	N	2	Mixed	Adjusted, unadjusted	N
M	C	Not reported	White	Y	3	2 parent	Adjusted	N
F	C	Not reported	Not specified	N	3	Not specified	Unadjusted	N
F	C	Mixed	Diverse	N	2, 3	Mixed	Adjusted, unadjusted	Y
F	E, C	Mixed	Diverse	N	1	Mixed	Adjusted, unadjusted	Y
F	C	Mixed	Diverse	N	2	Mixed	Adjusted, unadjusted	N
F	C	Mixed	Diverse	N	2	Mixed	Adjusted, unadjusted	N
F	C	W/LM	White	N	3	2 parent	Adjusted	N
F	C	Mixed	Diverse	Y	3	Mixed	Unadjusted	N
M	C	Mixed	White, Black, Hispanic	N	2	Mixed	Unadjusted	N
M	C	Not reported	Not specified	N	3	2 parent	Adjusted	N
M	C	W/LM	Not specified	Y	3	2 parent	Adjusted	N
M	E, C	Mixed	White, Black, diverse	Y	1, 2	Mixed, 1 parent, 2 parent	Adjusted, unadjusted	N
M	C	M/U	White	N	1	1 parent	Adjusted	N
F	E	W/LM	Diverse	N	1, 6	Mixed	Adjusted	N
M	E	Mixed	Diverse	N	2	2 parent	Adjusted	N
F	E, C	W/LM	Diverse	N	2	Mixed	Adjusted, unadjusted	N
F	E, C	Mixed	White, Black, Hispanic	N	1, 2	Mixed	Adjusted	N, Y
F	C	M/U	White	N	1	2 parent	Unadjusted	N

(Table continues)

Table 1 (*continued*)

Author	Sample size range[a]	Effect size (r)[b]	Publication source	Measure of achievement[c]	Employment type[d]	NLSY	Study quality: Research design[e]	Study quality: Sample source[f]	Study quality: Impact score
Williams (1970)	≤100	−.122	Journal	Ach, GPA, IQ	FT/NE	N	C	2	NA
Woods (1972)	≤100	−.350	Journal	IQ	FT/PT	N	C	2	3.42
Youngblut et al. (2001)	101–300	.050	Journal	Ach, IQ	EMP/NE	N	C, R	2	1.53

Note. NLSY = National Longitudinal Survey of Youth.
[a] Sometimes sample sizes were readily available for effect sizes, and other times the exact sample sizes were not presented and had to be inferred from other information presented in the study. Often effect sizes within the same study were calculated on the basis of different sample sizes; hence, the range represents the range of sample sizes for different effects within a study. Exact sample sizes for each effect were used in the analysis. Sample size groupings were based roughly on quintiles.
[b] Effect sizes are for the concurrent employment comparison EMP/NE when available; pooled contrasts are presented for PT/NE and FT/NE when EMP/NE data were not available. When only early effects were presented, the early effect is provided.
[c] GPA = grades; Ach = formal achievement tests; teacher ratings = teacher ratings of academic performance; IQ = formal intelligence tests; low academic rank = maternal rating of child being behind in grade, participating in remedial class work, and having a relatively low class standing.
[d] EMP = any employment; NE = not employed; PT = part time; FT = full time. If statistics were presented for a comparison (i.e., EMP/NE) as well as for its constituent parts individually (i.e., for the employed group only and the not employed group only), only the comparison statistic is presented in this table.

of general achievement, such as the Comprehensive Test of Basic Skills, as well as achievement tests that were subject specific (e.g., reading and math subtests of the Peabody Individual Achievement Test [PIAT] and the Metropolitan Achievement Test). When only domain scores were provided, effects for these scores were combined by the software program to produce one formal achievement test outcome. Academic grades were coded for overall grade point average or grades by subject matter (e.g., science, reading). When multiple subject grades were provided, effects for each subject were combined to produce one grade outcome. Formal assessments of intellectual aptitude included overall tests of intelligence and IQ (e.g., Stanford–Binet Intelligence Scale), as well as tests that measured intellectual functioning in one domain (e.g., verbal domain: Peabody Picture Vocabulary Test [PPVT]). Teacher ratings of cognitive abilities (e.g., ratings of cognitive skills and competence) also were included in the meta-analysis.

Potential Moderating Variables

Both study-level and sample-level characteristics were examined as potential moderators of the association between maternal employment and children's achievement.[1] The study-level moderators were (a) NLSY status, (b) study quality (type of research design, source of sample, journal impact rating), (c) gender of first author, and (d) year of publication. The sample-level moderators were (a) SES, (b) race/ethnicity, (c) child gender, (d) child age/grade, (e) family structure, (f) timing of maternal employment, (g) adjusted or unadjusted effects, and (h) adjustment for child care. When information on the moderators was not provided by the authors or could not be inferred, it was coded as missing.

NLSY status. To examine the effect of NLSY status on the association of maternal employment to children's achievement, we created a two-level categorical moderator variable: NLSY study (if the study used a NLSY sample) and non-NLSY study. The NLSY studies typically relied on the PIAT for achievement tests and the PPVT for verbal intellectual functioning; grades were not commonly included in these studies.

Study quality. Three indices of study quality were created to describe (a) the general type of research design (longitudinal or cross-sectional), (b) the source of sample or type of sampling strategy (convenience, school/community, random/subset of random sample), and (c) the impact score of the peer-reviewed journal in which the study was published (actual rating ascribed to journal from the impact scores of the Web of Science, Journal Citation Reports; Thomson Scientific, 2005).

Gender of first author. A categorical indicator of gender of first author (male or female) was entered for each study. In cases of gender-ambiguous first names where the author was unknown to the project team, an Internet search was conducted to yield identifying information.

Year of publication. The actual year of publication (ranging from 1961 to 2005) of each study was used as a continuous moderator of the relationship between maternal employment and children's achievement.

SES. All but four studies provided information about the SES of the participants, either descriptively or quantitatively using an established index. Occasionally, a measure of parental educational attainment was the basis for the authors' SES classification (e.g., Bogenschneider & Steinberg, 1994). Study samples were designated as working/lower-middle class, middle/upper-middle class, or mixed SES. Some studies presented effects separately by SES for independent samples of children; in these cases, the separate effects for each independent sample were used.

Race/ethnicity. Study samples were coded for five racial/ethnic categories, with *majority* signifying over 80%: majority White; majority Black; majority Hispanic; racially/ethnically di-

[1] We thank the action editor and three anonymous reviewers for their suggestions concerning the analysis and presentation of potential moderators.

Gender of first author	Early (E) or concurrent (C) emp.	SES[g]	Race/ethnicity[h]	Analyses presented sep. by gender[i]	Age/grade[j]	Family structure[k]	Adjusted or unadjusted effects presented	Adjusted for child care
F	C	M/U	White	N	3	2 parent	Unadjusted	N
F	C	W/LM	Black	N	2	Not specified	Unadjusted	N
F	E, C	W/LM	Diverse	N	1	1 parent	Adjusted, unadjusted	N

[e] C = cross-sectional; R = retrospective; L = longitudinal.
[f] 1 = convenience; 2 = school, community, or health care center based; 3 = random or generally representative (or subset of such a sample).
[g] SES = socioeconomic status; W/LM = working/lower-middle class; M/U = middle/upper-middle class.
[h] Studies were classified into groups if samples were majority (more than 80%) of a certain ethnic group (i.e., White sample = 80% or more of the sample was white). Samples were classified as racially/ethnically diverse if there was no single race/ethnicity that made up 80% or more of the sample. If analyses were presented separately by group, each is listed.
[i] Y = effect sizes presented separately for boys and girls; N = effects sizes not presented separately for boys and girls.
[j] 1 = 0–5 years; 2 = 6–12 years/elementary school; 3 = 13+ years/high school.
[k] Studies were classified into groups if samples were majority (more than 80%) of a particular family structure (i.e., 1 parent = 80% or more of the sample was a one-parent family). Samples were classified as mixed if there was no family structure that made up 80% or more of the sample. If analyses were presented separately by family structure, each family structure, each family structure is listed.
[l] Sample size was winsorized to the 95th percentile.

verse (no 80% racial/ethnic majority); and international (non-U.S. sample). Studies varied as to whether it was the mother's, child's, or family's race/ethnicity that was coded.

Child gender. Twenty-three studies reported data for boys and girls separately, and the average effect sizes were directly contrasted using child gender as a two-level categorical moderator. Another avenue for data on child gender came from the eight studies that reflected the association between a gender-of-child variable (1 = girls, 0 = boys) and children's achievement among working mothers.

Child age/grade. Three age categories were created: young children (age 5 and under/preschool); school-age children (ages 6–12; kindergarten through sixth grade); and adolescents (ages 13–18; middle school and high school). If the study sample comprised a borderline age group, such as 5–6 years, the older category was applied (in this case, school-age). When studies included results for samples of children in more than one age group, data were entered for each independent age group.

Family structure. Family structure was represented as a three-level categorical moderator with majority set at 80% or more: (a) majority one-parent (single-mother) households; (b) majority two-parent households; or (c) mixed one- and two-parent families.

Timing of maternal employment. A majority of studies (62 of 68) presented information about the effects of maternal employment on achievement outcomes with both variables measured concurrently, that is, close in time. Partial temporal overlap was considered concurrent; for example, maternal employment assessed at ages 2–3 would be considered concurrent with achievement outcomes obtained at ages 3–4 unless employment data at ages 3–4 also were provided. Some studies presented effects for early maternal employment, either alone (6 of 68) or in conjunction with effects for concurrent timing (18 of 68). Early maternal employment usually referred to mothers' work during the child's infancy; sometimes it extended through toddlerhood. Early effects of maternal employment were examined in relation to children's achievement as assessed some years later.

Adjusted versus unadjusted effects. This moderator examined the importance of adjusting for other variables (e.g., family income, maternal level of education, number of siblings) for the association between maternal employment and children's achievement. A code of 1 was given if the effect was adjusted, and 0 was assigned if the effect was not adjusted.

Child care. Some studies presented effect sizes for the effect of maternal employment on children's achievement adjusted for child care. Controls for child care included type of child-care arrangement (e.g., center-based, family day care), total number of child-care arrangements, and quality of child care (e.g., caregiver–child ratio; observer-based assessment of the quality of caregiving). Nine studies included effect sizes with one or more child-care controls. However, only three of these studies focused on concurrent effects of maternal employment on achievement. These three studies presented effects adjusted for the presence and type of child-care arrangements but did not include measures of quality of child care.

Meta Analytic Procedures

Effect Sizes

Weighted, average effect sizes were calculated and analyzed using commercially available software programs, Comprehensive Meta-Analysis (Borenstein, Rothstein, & Cohen, 2005) and Stata (Version 9.0; StataCorp, 2005). All results presented are from random effects models where the error term is composed of variation originating from both within-study variability and between-study differences (Cooper & Hedges, 1994). In contrast to the fixed effects model, which assumes a common underlying effect, the random effects model estimates the average effect size assuming that the studies originated from populations with varying effect sizes (Cooper & Hedges, 1994). The presence of homogeneity among the effect sizes was evaluated using the Q_{within} (Q_{w}) statistic (Hedges & Olkin, 1985). When the hypothesis of homogeneity was rejected, moderators were introduced to help explain heterogeneity among the effect sizes.

Some studies presented descriptive statistics in the form of means, standard deviations, and sample sizes for specific groups

(e.g., employed vs. not employed), and these statistics were entered directly into the program. For other studies, correlations were entered when available, and when unavailable, they were calculated by the authors from other statistics presented according to R. Rosenthal (1991) and entered into the program. When both adjusted and unadjusted effects were presented, adjusted effects were selected for use in the overall meta-analysis. In the moderator analyses, both adjusted and unadjusted effects were contrasted. When both early and concurrent effects were presented, concurrent effects were used in the overall meta-analysis; the early effects were used only in the contrast of the timing of maternal employment.

The common measure of effect size used for all studies included in the present meta-analysis is the *r* statistic, following the recommendations of R. Rosenthal (1991). Cohen's (1988) guidelines for small ($r = .10$), medium ($r = .30$), and large ($r = .50$) effects were used to evaluate the practical importance of the effect sizes presented. A *p* value set to .50 was entered when nonsignificant results were reported without accompanying information regarding the size of the effect, test statistic, or *p* value (R. Rosenthal, 1995).

When one considers the effect of any maternal employment on children's achievement, a negative value of *r* indicates that maternal employment is associated with lower children's achievement, and a positive value of *r* indicates that maternal employment is associated with higher children's achievement. When one interprets the effects of full-time employment versus part-time employment on children's achievement among working mothers, a positive value of *r* indicates that part-time employment is associated with higher children's achievement than full-time, and a negative value of *r* indicates that part-time employment is associated with lower children's achievement than full-time. When one interprets the association between the gender-of-child variable (1 = girls, 0 = boys) and achievement in the subsample of employed mothers, a positive value of *r* implies higher achievement among girls when compared with boys.

Achievement Outcomes

The aggregate effect of maternal employment on children's achievement was estimated by combining overall achievement outcomes and utilizing the study as the unit of analysis. Many studies presented information about the relationship between two or more measures of children's achievement and maternal employment, which resulted in multiple effects from a single study that were based on the same sample of children. In this situation, multiple effects from a single study were not used because it would have violated the independence assumption. For the purpose of estimating the effect of maternal employment on children's achievement using all outcomes, multiple effects from the same study were combined by the software program, and a single value of the *r* statistic was used to represent each study.

Other studies presented information separately for different subgroups of children (e.g., boys vs. girls or by age/grade of the child). Information from independent subgroups of children was combined by the software program to estimate a single, weighted value of the *r* statistic for each study in order to estimate the overall effect of maternal employment on children's achievement. Subsequent analyses stratify by individual achievement performance outcomes (formal achievement tests, grades, formal tests of intellectual functioning, teacher ratings) to allow for the possibility of a differential effect of maternal employment on each outcome and to permit examination of potential moderators of the relationship between maternal employment and children's achievement. In these analyses, the study was used as the unit of analysis, and homogeneity among the effect sizes was tested using the Q_w statistic. When we evaluated moderator variables, the unit of analysis was the study except when an individual study presented information separately for independent subgroups of children; in this situation the independent subgroups or samples were used as the units of analysis.

An exception to this strategy was made for tests of three moderator variables: early or concurrent timing of maternal employment, whether the effect size was adjusted for covariates, and whether the effect size was adjusted for child care. Because many studies presented effect sizes using the same sample of children across the levels of these moderators (e.g., presented both unadjusted and adjusted effect sizes), two analytic strategies were adopted. The first strategy used all studies presenting information for these moderators and assumed the effects, which were often calculated using overlapping or the same samples of children, were independent across the levels of the moderator variables. The second strategy analyzed independent effects by omitting studies that presented effects for both levels of the moderators, thus ensuring that the effects contrasted between the levels of the moderators were independent. For each of these three moderators, the two analytic strategies yielded the same inferential conclusion.

Moderators

The impact of the categorical moderators was assessed by the significance of the $Q_{between}$ (Q_b) statistic as calculated from a mixed effects model comparing the effect sizes across the levels of the moderator variable. The variable was judged a significant moderator of the relationship between maternal employment and children's achievement using the $p = .05$ level of significance.

Two continuous moderators, journal impact factor and year of publication, were evaluated using individual random effects meta-regressions (Thompson & Higgins, 2002) where the test statistic for the effect size was regressed on the journal impact factor and year of publication. The moderators were considered significant if the slope (*b*) of the regression line was significantly different from zero using the $p = .05$ level of significance.

In some cases, the number of studies presenting results separately for levels of the moderator variables was quite small. We elected to restrict testing of a moderator variable to situations where there were at least three studies in each level of the moderator variable (see also Lorber, 2004), which sometimes resulted in excluding some levels from analyses. In these cases, the reader is strongly cautioned regarding the generalizability of the findings and is encouraged to view the results as tentative in nature.

Analytic Strategies for Including NLSY Studies

A sizable subset of the 68 studies ($k = 19$) analyzed data from the NLSY. The NLSY studies that met criteria for the meta-analysis varied somewhat in the subsample of children and mothers included in the analyses, the racial/ethnic composition of the sample(s), the measurement of achievement, the age of the chil-

dren at the time of measurement, and the definitions of the maternal employment variable(s). The potential nonindependence of the NLSY samples and their overrepresentation in the findings for formal tests of achievement and intellectual functioning prompted us to devise procedures for handling these studies. To represent the range offered by the NLSY studies, the studies with the most negative and the most positive effects were designated as NLSY-low and NLSY-high, respectively.

For the purposes of estimating the effect sizes for the separate achievement test and intellectual functioning outcomes and for testing moderators, the issue of nonindependence among the NLSY studies was handled by running the analyses once with the NLSY-low study and once with the NLSY-high study. Baum (2004), Han et al. (2001), Harvey (1999), Menaghan, Kowaleski-Jones, and Mott (1997), Ricciuti (1999), Ruhm (2004), J. R. Smith, Brooks-Gunn, Klebanov, and Lee (2000), and Waldfogel et al. (2002) were each used at least once as the representative low or high NLSY study. In this way, the analyses that involve NLSY studies have a study that represents each "end" of the NLSY contribution to the effect sizes. For inclusiveness, when presenting the achievement outcomes, we present results with all relevant NLSY studies before we substitute the representative NLSY-low or NLSY-high study. An additional strategy to give just due to these nationally representative studies was to use the full set of relevant NLSY studies as a moderator in analyses that directly contrasted the effect sizes from NLSY-based studies to those of non-NLSY-based studies.

Publication Bias

Although a comprehensive literature review was undertaken, of concern is the tendency for only statistically significant results to be published and represented in automated literature searches of databases. We evaluate the potential for publication bias using two methods: the trim and fill method (Duval & Tweedie, 2000) and the Egger's linear regression method (Sterne & Egger, 2005).

The trim and fill method is a nonparametric method that reduces the subjectivity inherent in visual assessment of the symmetry of funnel plots by systematically omitting studies until the funnel plot is symmetrical and then replacing each study with a corresponding imputed value for the missing study to maintain the symmetry of the funnel plot (Duval & Tweedie, 2000). This method was implemented using the *metatrim* macro in Stata (StataCorp, 2005) with the linear trimming algorithm and applied to both sides of the funnel plot to detect asymmetry due to studies missing in both positive and negative directions (Sutton, 2005).

The trim and fill procedure was also replicated assuming both fixed and random effects models in order to compare the results from the two approaches (Duval, 2005; Sutton, 2005). Results from the fixed and random effects trim and fill were consistent and comparable in magnitude to the nonsignificant, unadjusted average effect of maternal employment on formal achievement tests, formal measures of intellectual functioning, and teacher rating outcomes. Results from the fixed effects trim and fill procedure for all outcomes combined and grades were consistent with the unadjusted effects; however, for these outcomes, the random effects trim and fill produced small, significant, positive effects. Current thinking is that the fixed effects trim and fill method is more tenable and therefore a more reasonable approach to detect and adjust for funnel plot asymmetry (Duval, 2005; Sutton, 2005). We adopt that recommendation here and present the fixed effects trim and fill results in Tables 2–6.

As an additional check for the presence of publication bias, Egger's regression method was utilized for each study outcome when including all NLSY studies and when substituting a low and high NLSY study. The two-sided p values from Egger's tests of the regression intercept (Sterne & Egger, 2005) were greater than the $p = .10$ level of significance for each of the study outcomes, indicating that the funnel plots were symmetrical, which suggested the absence of publication bias in the meta-analyses.

Statistical Power

Power was calculated to establish whether the present meta-analysis had the ability to statistically detect a small effect, if present, of maternal employment on children's achievement. Separate calculations were performed for each outcome and for all outcomes combined using r as the measure of effect size and using $r = .10$ to represent a small effect (Cohen, 1988). In general, power is a function of both the effect size and the variability of the effect size. In the random effects model, the variance of each effect size is composed of the individual study variance (v_i) and a component of variance representing between-study differences (τ^2). The sampling variance ($v.$) of the random effects mean of the effect size distribution is calculated according to Hedges and Pigott (2001), as follows:

$$v. = 1/\sum_{i=1}^{k} (v_i + \tau^2)$$

where k = number of studies.

Power is calculated using the observed number of studies (k) and between-study variance component (τ^2), assuming a small effect ($r = .10$) and a two-sided test at the $p = .05$ level of significance. Individual study variances (v_i) and the between-study variance components for each outcome and across all outcomes were calculated by the Comprehensive Meta-Analysis program (Borenstein et al., 2005).

For the effect of maternal employment on children's achievement, when combining across all outcomes, the power to detect a small effect is .99 ($k = 57$ studies; $\tau^2 = .016$). The power to detect small effects for formal tests of intellectual functioning and grades is .99 ($k = 25$; $\tau^2 = .002$) and .97 ($k = 16$; $\tau^2 = .008$), respectively. Power to detect a small effect for the formal achievement tests outcome is .71, somewhat lower than the other outcomes because of the relatively larger amount of between-study heterogeneity ($k = 25$ studies; $\tau^2 = .035$). The power for teacher ratings also is .71 ($k = 8$).

On the basis of these calculations, which use the observed number of studies available in the present meta-analysis and the observed estimate of the between-study variance, τ^2, we anticipate adequate statistical power to detect small effects, if present, of maternal employment on grades and on formal tests of intellectual functioning, and when combining across all outcomes. Power to detect a small effect of maternal employment on formal achievement tests and teacher ratings is somewhat lower. In subsequent analyses, moderators of the relationship between maternal employ-

ment and children's achievement are evaluated to help explain the observed variability among the effect sizes.

Results

Study Characteristics

Characteristics of the retrieved studies are presented in Table 1. The 68 studies yielded 770 effect sizes (*Mdn* = 7, range = 1–81). The median sample size was 500, ranging from 30 to 100,000 (a total of 178,323 children). Forty-four studies (64.7%) presented information characterizing the effect of maternal employment on only one outcome, whereas 24 studies (35.3%) presented effects for more than one outcome; thus, the percentages below do not always add to 100%. Thirty-four studies (50.0%) provided effect sizes for formal achievement tests, 17 studies (25.0%) provided effect sizes for children's grades, 33 studies (48.5%) provided information on formal tests of intellectual functioning, and 9 studies (13.2%) provided effect sizes for teacher ratings. Of the 68 studies in the meta-analysis, 18 (26.5%) had male first authors and most (88%) were journal articles. Seven studies were published in the 1960s decade, 11 studies in each of the 1970s and 1980s decades, 23 in the 1990s decade, and 16 between 2000 and 2005.

Analyses of the study quality indicators revealed that 33 of the 68 studies used longitudinal designs (35 cross-sectional), 7 studies were based on samples of convenience, 27 studies were based on school or community samples, and 34 studies used probability samples (e.g., random) or subsets of probability samples. Journal impact factors ranged from 0.38 to 3.93 (*Mdn* = 1.54) and were available for 52 studies.

Eighteen studies (26.5%) presented data for both early and concurrent timing of maternal employment, 44 studies (64.7%) provided effect sizes for only concurrent employment, and 6 studies (8.8%) for the effects of early timing of maternal employment only. Sixty-four studies (94.1%) provided effects comparing the children of employed and not-employed mothers. Twenty-six studies (38.2%) provided effects contrasting full-time employment to nonemployment, 17 studies (25.0%) provided effect sizes contrasting part-time employment to nonemployment, and 43 studies (63.2%) provided effects for any employment (extent of employment not specified) versus no employment. Seventeen studies (25.0%) provided multiple effect sizes based on the extent of maternal employment (i.e., for both part- and full-time vs. no employment), and 16 studies (23.5%) provided information contrasting part-time and full-time maternal employment among employed mothers.

Eight studies were based on international samples, and a small number of studies presented effects separately for different ethnic groups (k = 7 studies). The international samples were from countries such as Canada, Belgium, New Zealand, and Israel. Twelve studies (17.6%) provided effects from a majority Black sample, 3 studies (4.4%) from a majority Hispanic sample, 24 studies (35.3%) from a majority White sample, and 25 studies (36.8%) from a racially/ethnically diverse sample (no 80% racial/ethnic majority); 7 studies did not describe the race/ethnicity of the sample.

A small number of studies reported information separately for different SES groups (k = 5 studies), 21 studies (30.9%) provided effects from a majority working/lower-middle-class sample, 17 studies (25.0%) from a majority middle/upper-middle-class sample, and 32 studies (47.1%) from samples of mixed SES; 4 studies did not report SES.

It appeared that the distribution of race/ethnicity was not even across the levels of SES. Of those studies based on samples classified by their authors or the authors of this meta-analysis as working/lower-middle class (k = 21, 22 effect sizes), approximately 23% were based on White samples, 27% on Black samples, 32% on racially/ethnically diverse samples, and 9% on international samples; race/ethnicity information was not presented for 9% of the working/lower-middle-class samples. Of those samples classified as middle/upper-middle class (k = 17, 18 effect sizes), 56% were White, 5.5% were Black, and 22% were international. There was no available information on race/ethnicity for 16.5% of the middle/upper-middle-class samples. Of those studies based on samples that were mixed in terms of SES (k = 32, 40 effect sizes), 27.5% were White, 12.5% were Black, 7.5% were Hispanic, 42.5% had no racial/ethnic majority, and 10% were international samples.

Twenty-four studies (35.3%) reported effects separately by gender of the child. Whereas 13 studies reported effects from children in multiple, independent age groups, 24 studies (35.3%) provided effect sizes from preschool age children, 34 studies (50.0%) from elementary school age children (kindergarten through sixth grade), and 23 studies (33.8%) from children in middle or high school.

In terms of family structure, 10 studies (14.7%) were based on one-parent families, 24 studies (35.3%) presented effects for two-parent families, and 30 studies (34.1%) reported effects for mixed samples of one- and two-parent families. Four studies provided effects for both one-parent and two-parent samples, and 8 studies did not provide information on family structure. It appeared that family structure was not equally distributed across ethnic groups: Of the studies that were primarily based on White samples or presented effect sizes separately for White samples (k = 24, 27 effect sizes), approximately half were composed of a majority of two-parent families (52%) or presented effects stratified by race and family structure, and only 15% were majority single-parent families; the remainder were mixed one- and two-parent families (26%) or did not report family structure (7%). Of the studies based primarily on Black samples or that presented effect sizes separately for Black samples (k = 12, 15 effect sizes), 47% were composed of a mix of one- and two-parent families, 33% were composed of a majority of one-parent families, and only 13% were composed of a majority of two-parent families; for the remaining 7%, family structure was not specified. The 3 studies that presented effect sizes separately for Hispanic participants had samples with a mix of one- and two-parent families. Studies based on samples that were racially/ethnically diverse (k = 25, 28 effect sizes) were also primarily mixed in terms of family structure (68%). The international samples (k = 8) were 63% two-parent and 37% mixed one- and two-parent families.

A majority of studies (48 of 68, 70.6%) controlled for background characteristics and/or contextual variables. Twenty studies (29.4%) presented results from both adjusted and unadjusted analyses; 20 (29.4%) studies reported only unadjusted, direct effects. Nine studies (13.2%) reported effects adjusted for child care, a subset of which were based on the concurrent effects of maternal employment versus nonemployment.

Employment (Full Time and/or Part Time) Versus No Employment

All Achievement Outcomes Combined

The first set of analyses examined associations between mothers' work outside the home and children's achievement, utilizing all achievement outcomes. Fifty-seven studies were included in this first meta-analysis that compared achievement outcomes of children with employed mothers and nonemployed mothers.

The weighted average correlation was $r = .032$, *ns* ($k = 57$). The Q_w statistic, 11,183.30 ($p < .001$), signified the presence of heterogeneity among the effect sizes. When the sample size of one outlying study (Anderson et al., 1986) was winsorized, the Q_w was substantially reduced and yielded a nonsignificant positive trend association of maternal employment with children's achievement (see Table 2).

For inclusiveness at the start of the meta-analysis, the preceding analyses incorporated all of the relevant NLSY studies ($k = 13$); however, this approach included overlapping samples among the studies with formal tests of achievement and intellectual functioning as outcomes. Therefore, we subsequently followed our declared strategy of running the meta-analysis using the two representative NLSY studies. With NLSY-low in the analysis, the effect of maternal employment on children's achievement was not significant; similarly, a nonsignificant effect was obtained with NLSY-high representing the NLSY studies (see Table 2).

Using the trim and fill method, we imputed estimates for nine missing studies and used them in the calculation of the adjusted average effect size for all outcomes combined, which resulted in a nonsignificant effect of maternal employment on children's achievement when all NLSY studies were included. Substitution of the low and high NLSY studies also yielded similarly nonsignificant effects; one study was trimmed and filled with NLSY-low in the analysis, and none was imputed when NLSY-high was used as the representative NLSY study.

The significant Q statistics (Q_w) underscore the need to address further the issue of heterogeneity. To meet this objective, we examined the effect of the moderators on the relationship between maternal employment and children's achievement. Results of analyses for all achievement outcomes combined using NLSY substitution are discussed below and presented in Table 2. The results utilizing all studies (not included in Table 2) are presented below, except when neither the moderator nor the point estimates reached trend or conventional levels of significance (i.e., NLSY status, source of sample, journal impact factor, adjusted vs. adjusted effects, and adjustment for child care). Detailed results for these nonsignificant moderators are available from the authors.

Study quality. With all studies included, study design was not a significant moderator ($k = 57$, $Q_b = 0.04$, *ns*), but the point estimate for longitudinal studies indicated a small, positive effect ($k = 23$, $r = .023$, $p = .03$). The point estimate for cross-sectional studies was of similar magnitude and direction ($k = 34$, $r = .031$), but it was not significant. This pattern was reproduced with the NLSY substitution, although when the NLSY-low study was used, the effect for longitudinal studies was not significant.

Gender of first author. With all eligible studies, those with female first authors produced a nonsignificant effect size, whereas studies with a male first author were associated with a small but positive effect; however, the interaction was not significant ($k = 57$, $Q_b = 0.38$, *ns*; female first, $r = .026$, *ns*; male first, $r = .047$, $p = .040$). The overall results were replicated when the NLSY-high study was substituted as the representative NLSY study. In contrast, with NLSY-low as the representative study, neither the moderator nor the point estimates were significant.

Year of publication. When we examined all of the achievement outcomes using all studies, there was a pattern of more positive associations in the more recent studies than in the earlier years ($k = 57$; $b = .003$, $p = .051$). The pattern was replicated with NLSY substitution.

SES. With all eligible studies included, the SES moderator was significant ($k = 57$ samples, $Q_b = 6.44$, $p = .040$). Although the point estimates did not reach traditional levels of significance, the direction of effects was negative in middle/upper-middle-class samples ($k = 16$, $r = –.043$, $p = .087$) and positive in working/lower-middle-class ($k = 18$, $r = .055$, *ns*) and mixed-SES samples ($k = 23$, $r = .037$, *ns*). This pattern was replicated with NLSY substitution.

Race/ethnicity. Race/ethnicity was a significant moderator ($k = 59$ samples, $Q_b = 10.99$, $p = .027$). When all eligible studies were included, significant, small, positive effects emerged for the racially/ethnically diverse samples ($k = 18$, $r = .098$, $p = .033$) and international samples ($k = 6$, $r = .055$, $p = .041$). The effect for the majority White samples was nonsignificant ($k = 22$, $r = –.028$, *ns*), as were the effect sizes for the majority Black and majority Hispanic samples ($k = 10$, $r = .025$ and $k = 3$, $r = .020$, respectively). Similar patterns of significance ensued when the representative low and high NLSY studies were substituted.

Child gender. Studies that included relevant statistics about gender of child presented statistics separately for subsamples of boys and girls and/or relied on a gender-of-child (0, 1) variable. The separate effect sizes indicated a positive but small significant association for girls and a nonsignificant effect for boys. However, the interaction term was not significant ($Q_b = 1.84$, *ns*). (Only two NLSY studies presented effects separately for boys and girls; because of the minimal risk of redundancy, NLSY substitution was unnecessary.)

Supporting this pattern were findings from the eight studies that presented statistics for associations between a gender-of-child variable (1 = girls, 0 = boys) and achievement among the subsample of children of working mothers ($k = 8$). (Six of these studies were also included in the analysis that separated boy and girl samples.) The effect size was small but significant ($r = .164$, $p = .002$; $Q_w = 39.32$, $p < .001$), indicating that girls' achievement was higher than boys' among the samples of employed mothers.

Child age/grade. With all eligible NLSY studies included, the child age/grade moderator was not significant ($Q_b = 2.02$, *ns*). However, one of the individual effects, that for the elementary school age samples, was significant and positive, albeit small in magnitude ($k = 26$ samples, $r = .061$, $p = .024$). The effects for the preschool ($k = 18$) and adolescent samples ($k = 19$) were not significant ($r = .020$, $p = .094$, and $r = .019$, *ns*, respectively). Similar results were obtained when the NLSY-high and -low studies were substituted.

Family structure. For all outcomes combined, family structure was a significant moderator of the association between maternal employment and children's achievement ($k = 52$ samples, $Q_b = 6.87$, $p = .032$). Small, significant positive effects were apparent

Table 2
Effect of Maternal Employment on Children's Achievement: All Achievement Outcomes Combined

Outcomes and moderators	Original studies k	r	95% CI	Q_w	No. studies filled	Trim and fill estimated[a] r	95% CI
All achievement outcomes[b]	57	.033†	−.004, .070	1,564.66**	9	.011	−.033, .054
All achievement outcomes[c]	45	.034	−.013, .084	1,535.91**	1	−.020	−.070, .029
All achievement outcomes[d]	45	.038	−.009, .086	1,531.77**	0	.038	−.009, .086

	k	r	95% CI	Q_w	Q_b
NLSY sample					1.36
Yes	13	.004	−.013, .021	23.67*	
No	44	.036	−.015, .086	1,523.53**	

Moderators: Study characteristics

	NLSY-low[c] k	r	95% CI	Q_w	Q_b	NLSY-high[d] k	r	95% CI	Q_w	Q_b
Study quality: Research design					0.01					0.18
Cross-sectional	34	.031	−.041, .102	1,468.74**		34	.031	−.041, .102	1,468.74**	
Longitudinal	11	.035	−.010, .080	63.09**		11	.048*	.007, .088	62.75**	
Study quality: Source of sample					0.36					0.21
Sample of convenience	7	.077	−.179, .324	84.86**		7	.077	−.179, .324	84.86**	
School/community	25	.029	−.083, .141	1,087.33**		25	.029	−.083, .141	1,087.33**	
Random/subset of random	13	.010	−.023, .042	127.60**		13	.020	−.014, .053	147.56**	
Gender of first author					0.27					0.62
Male	12	.053	−.020, .126	155.50**		12	.063*	−.001, .126	133.58**	
Female	33	.028	−.033, .089	1,374.88**		33	.028	−.033, .089	1,374.88**	

	k	Slope	95% CI for slope	k	Slope	95% CI for slope
Year of publication	45	.004†	−.007, .0001	45	.004*	.0004, .008
Study quality: Journal impact score	31	.014	−.018, .046	31	.011	−.022, .0433

Moderators: Sample characteristics

	NLSY-low k_g	r	95% CI	Q_w	Q_b	NLSY-high k_g	r	95% CI	Q_w	Q_b
SES					5.10†					5.48†
Working/lower middle	16	.053	−.032, .137	219.37**		15	−.061	−.038, .158	211.67**	
Middle/upper	16	−.043	−.091, .006	76.28**		16	−.043	−.091, .006	76.28**	
Mixed	13	.053	−.055, .160	1,030.97**		13	.053	−.055, .160	1,030.97**	
Race/ethnicity[e]					12.66**					13.25**
80% or more White	17	−.043†	−.087, .002	1,16.70**		17	−.043†	−.087, .002	116.70**	
80% or more Black	6	.046	−.104, .013	11.81**		6	.046	−.104, .013	11.81**	
Diverse	11	.148†	−.002, .290	7.04		11	.161*	.011, .405	7.04	
International	6	.055*	.002, .107	13.68*		6	.055*	.002, .107	13.68*	
Child gender[f]					1.84					
Boy	17	.015	−.040, .069	85.40**						
Girl	17	.075*	.006, .143	145.62**						
Child age/grade					2.26					1.79
<6 yrs/preschool	10	−.009	−.043, .025	24.19**		11	.017	−.031, .064	29.72**	
6–12 yrs/elementary	21	.073*	.004, .140	355.27**		21	.073*	.004, .140	355.27**	
13–18 yrs/middle & high	19	.019	−.064, .101	1,118.91**		18	.023	−.065, .110	1,100.13**	
Family structure[e]					7.91*					10.42**
Majority 2-parent	22	−.009	−.043, .025	85.42**		22	−.009	−.043, .025	85.42**	
Majority 1-parent	7	.149*	.001, .291	105.64**		7	.149*	.001, .291	105.64**	
Mixed 1- & 2-parent	11	.054*	.009, .099	81.60**		11	.065*	.025, .105	76.92**	
Timing of maternal employment					1.71					1.70
Early	12	−.001	−.030, .028	44.08**		12	.038	−.010, .085	37.09**	
Concurrent	45	.036	−.012, .084	1,528.94**		45	.003	−.022, .027	1,531.77**	
Adjusted/unadjusted effect					0.23					0.34
Adjusted	31	.016	−.011, .043	151.84**		31	.019	−.008, .046	154.94*	
Unadjusted	27	.037	−.043, .116	1,474.44**		27	.043	−.035, .121	1,487.68**	

Table 2 (*continued*)

	Moderators: Sample characteristics (*continued*)									
	NLSY-low					NLSY-high				
	k_g	r	95% CI	Q_w	Q_b	k_g	r	95% CI	Q_w	Q_b
Child care[g]					0.16					
Not adjusted for child care	20	.014	−.010,.037	68.25**						
Adjusted for child care	3	.006	−.026,.037	0.91						

Note. Outcomes include formal tests of achievement and intellectual functioning, grades, and teacher ratings. k = no. studies; k_s = no. independent subgroups or samples of children, except for timing of maternal employment, adjusted/unadjusted effect, and adjustment for child care. Positive rs indicate that children of employed mothers had higher achievement than children of nonemployed mothers. CI = confidence interval; NLSY = National Longitudinal Survey of Youth; SES = socioeconomic status.

[a] Fixed effects trim and fill method; studies were trimmed to the right of the mean effect size; no studies were trimmed to the left of the mean effect size. When analyses were replicated using a random effects trim and fill method, there were statistically significant, small, positive effects of maternal employment on children's achievement when all NLSY studies were included and when low and high NLSY studies were substituted in the analysis.

[b] All NLSY studies included in estimation of average effect size.

[c] All NLSY studies excluded except NLSY study with the most negative effect (NLSY-low).

[d] All NLSY studies excluded except NLSY study with the most positive effect (NLSY-high).

[e] The 80% or more Hispanic level is not included because there were fewer than three samples.

[f] Two NLSY studies provided effects separately for boys and girls, and both are included.

[g] Comparison is between adjusted effects without child care and adjusted effects including child care. There were too few studies providing effects adjusted for child care to exclude a low and high NLSY study.

$^{\dagger}p < .10$. $^{*}p < .05$. $^{**}p < .005$.

for the samples with only one parent ($k = 7$, $r = .149$, $p = .049$) and for samples that included both one- and two-parent families ($k = 23$, $r = .032$, $p = .004$); the effect for the two-parent only samples ($k = 22$) was not significant ($r = –.009$, *ns*). These results were replicated with NLSY substitution.

Timing of maternal employment. The timing of maternal employment, either early, during the child's infancy, or concurrent with the achievement assessments, was examined as a potential moderator. With all eligible study samples ($k = 78$), the interaction term fell short of significance ($Q_b = 2.78$, $p = .095$), as did the positive point estimate for the concurrent employment samples ($k = 57$, $r = .033$, $p = .075$); the effect for the early timing group was not significant ($k = 21$, $r = –.002$, *ns*). Neither the moderator nor the point estimates were significant with NLSY substitution. Nonsignificant results were replicated when checks were instituted for redundancy in the samples. The results were unchanged when analyses with and without NLSY substitution were restricted to the independent studies ($k = 44$) that contributed only early or concurrent effects.

Separate Achievement Outcomes: Formal Achievement Tests

In the following analyses, effect sizes representing the association between maternal employment and children's scores on formal measures of achievement were the dependent measures. If available, total test scores were used; if only subtest scores (e.g., reading, math) were available, these scores were combined by the software program to produce one overall effect size for achievement.

The weighted average effect size for the comparison of children with employed and nonemployed mothers from 25 studies was not significant for achievement, nor were the effect sizes when NLSY-low or -high was used as the representative NLSY study. With the trim and fill procedure, the overall effect remained nonsignificant; the trim and fill adjusted effects also were comparable to the unadjusted effects with NLSY substitution (see Table 3 and its footnote b).

In the above tests of the association of maternal employment with children's formal achievement test scores, there was significant heterogeneity among the effect sizes. Potential moderators are examined to help account for the observed variability in the effect sizes. One moderator, adjustment for child care, was not analyzed because there were too few studies. Results of analyses using NLSY substitution are discussed below and presented in Table 3. The results utilizing all studies (not included in Table 3) are presented below except for the following moderators and point estimates, which were not significant: NLSY status, source of sample, gender of first author, year of publication, SES, race/ethnicity, child gender, child age/grade, timing of maternal employment, and adjusted versus unadjusted effects.

Study quality. Type of design was not a significant moderator ($k = 25$, $Q_b = 0.08$, *ns*), but there was a significant, positive effect for the longitudinal studies ($k = 9$, $r = .041$, $p = .034$). The effect for the cross-sectional studies was not significant ($k = 16$, $r = .022$, *ns*). The pattern was replicated with NLSY substitution.

The continuous moderator of journal impact factor was significant for maternal employment and formal achievement tests; more positive effects were detected among studies published in journals designated as having greater impact ($k = 17$, $b = .072$, $p = .031$). This moderator remained significant when NLSY-low and NLSY-high were substituted.

Family structure. When all studies were included, family structure was not a significant moderator of the association between maternal employment and children's formal achievement test scores ($k = 23$ samples, $Q_b = 3.36$, *ns*). The point estimate for the mixed group was significant and positive ($k = 8$, $r = .049$, $p = .017$), but the effects for the one-parent samples and two-parent samples were not significant (one-parent: $k = 5$, $r = .055$, *ns*;

Table 3
Effect of Maternal Employment on Formal Achievement Tests

Outcomes and moderators	Original studies k	r	95% CI	Q_w	No. studies filled	Trim and fill estimated[a] r	95% CI
Formal achievement test outcomes[b]	25	.030	−.048, .108	1,794.89**	7	.027	−.057, .111
Formal achievement test outcomes[c]	21	.028	−.059, .114	1,787.89**	5	.028	−.068, .123
Formal achievement test outcomes[d]	21	.034	−.056, .123	1,784.31**	6	.028	−.069, .124

	k	r	95% CI	Q_w	Q_b
NLSY sample					0.06
Yes	5	.018	−.031, .067	9.57*	
No	20	.031	−.063, .123	1,780.55**	

Moderators: Study characteristics

	NLSY-low[c] k	r	95% CI	Q_w	Q^b	NLSY-high[d] k	r	95% CI	Q_w	Q_b
Study quality: Research design					0.09					0.44
Cross-sectional	16	.021	−.111, .153	1,724.07**		16	.021	−.111, .153	1,724.07**	
Longitudinal	5	.043†	−.006, .092	32.95**		5	.068**	.033, .103	11.49*	
Study quality: Source of sample					0.02					0.001
School/community	11	.035	−.233, .300	1,489.10**		11	.035	−.233, .300	1,489.10**	
Random/subset of random	8	.015	−.037, .067	182.13**		8	.030	−.026, .086	186.98**	
Gender of first author					0.01					0.06
Male	5	.032	−.042, .105	24.77**		6	.045	−.017, .107	26.52**	
Female	16	.025	−.082, .132	1,758.42**		15	.028	−.089, .145	1,752.18**	

	k	Slope	95% CI for slope	k	Slope	95% CI for slope
Year of publication	21	.005	−.002, .011	21	.005	−.002, .012
Study quality: Journal impact score	13	.089*	.014, .164	13	.084*	.006, .162

Moderators: Sample characteristics

	NLSY-low[c] k_s	r	95% CI	Q_w	Q_b	NLSY-high[d] k_s	r	95% CI	Q_w	Q_b
SES					2.26					2.67
Working/lower middle	7	−.044	−.292, .210	308.83**		7	−.044	−.292, .210	308.83**	
Middle/upper	9	−.050	−.162, .064	186.68**		9	−.050	−.162, .064	186.68**	
Mixed	8	.080	−.051, .208	890.23**		8	.094	−.042, .227	834.88**	
Race/ethnicity[e]					5.22†					5.24†
80% or more White	9	−.092†	−.195, .013	345.18**		9	−.077	−.188, .036	350.69**	
80% of more Black	5	.008	−.034, .050	6.90		5	.050	.015, .116	11.88*	
Diverse	5	.166	−.057, .374	587.33**		5	.166	−.057, .374	587.33**	
Child gender[f]					0.10					
Boy	5	.040	−.054, .134	29.55**						
Girl	5	.058†	−.010, .126	14.41**						
Child age/grade					0.13					0.06
<6 yrs/preschool	3	.022	−.070, .114	2.83		3	.022	−.070, .114	2.83	
6–12 yrs/elementary	12	.009	−.101, .119	502.23**		12	.021	−.105, .147	513.29**	
13–18 yrs/middle & high	8	.041	−.098, .179	928.95**		8	.041	−.098, .179	928.95**	
Family structure					3.51					9.32*
Majority 2-parent	10	−.007	−.058, .044	64.60**		10	−.007	−.058, .044	64.60**	
Majority 1-parent	5	.055	−.014, .123	11.43*		5	.055	−.014, .123	11.43*	
Mixed 1- & 2-parent	4	.058*	.003, .112	28.41**		4	.080**	.056, .103	4.20	
Timing of maternal employment					1.22					1.17
Early	10	−.024	−.053, .005	33.14**		9	−.019	−.052, .014	29.13**	
Concurrent	21	.028	−.059, .114	1,787.89**		21	.034	−.056, .123	1,784.31**	

Table 3 (*continued*)

	Moderators: Sample characteristics (*continued*)									
	NLSY-low[c]					NLSY-high[d]				
	k_s	r	95% CI	Q_w	Q_b	k_s	r	95% CI	Q_w	Q_b
Adjusted/unadjusted effect					0.20					0.23
Adjusted	16	−.003	−.033, .026	62.44**		15	.001	−.032, .034	61.24**	
Unadjusted	14	.029	−.109, .167	2,228.12**		15	.034	−.098, .165	2,232.39**	

Note. k = no. studies; k_s = no. independent subgroups or samples of children, except for timing of maternal employment and adjusted/unadjusted effect. Positive rs indicate that children of employed mothers had higher achievement than children of nonemployed mothers. CI = confidence interval; NLSY = National Longitudinal Survey of Youth; SES = socioeconomic status.
[a] Fixed effects trim and fill method; studies were trimmed to the right of the mean effect size; no studies were trimmed to the left of the mean effect size. Results from the random effects trim and fill method were consistent and of comparable magnitude.
[b] All NLSY studies included in estimation of average effect size.
[c] All NLSY studies excluded except NLSY study with the most negative effect (NLSY-low).
[d] All NLSY studies excluded except NLSY study with the most positive effect (NLSY-high).
[e] The international and majority Hispanic levels are not included because each had fewer than three studies.
[f] No NLSY studies provided effects separately for boys and girls.
$^{\dagger}p < .10$. $^{*}p < .05$. $^{**}p < .005$.

two-parent: $k = 10$, $r = –.007$, *ns*). These results were replicated when NLSY-low and NLSY-high were substituted.

Separate Achievement Outcomes: Academic Grades

Effect sizes for maternal employment and children's academic performance in the classroom, measured by grade point average or other numeric-equivalent scales, were the dependent variables in the next set of analyses (see Table 4). Only one NLSY study (Baum, 2004) reported usable grade outcomes, and so NLSY substitution was not needed, nor was examination of a NLSY moderator required. The weighted average correlation from 16 studies for the random effects model was not significant. The adjusted effect from the fixed effects trim and fill procedure was comparable in magnitude to the unadjusted effect as estimated from the original studies; however, the random effects trim and fill procedure produced a significant, small positive association of maternal employment with children's grades. Because there was significant heterogeneity, potential moderators were examined to help account for the variability among the effect sizes. The following moderators and the resulting point estimates were not statistically significant or trends: source of sample, journal impact factor, gender of first author, year of publication, SES, family structure, timing of maternal employment, and adjusted versus unadjusted effects. Two moderators, type of design and child care, were not analyzed because too few studies had presented results for academic grades in the levels of these moderators. Results of analyses for grades are presented in Table 4.

Race/ethnicity. Two levels of the race/ethnicity moderator had sufficient sample sizes for this analysis. Associations between maternal employment and grades tended to operate differently in the majority White and racially/ethnically diverse samples, revealing a small, positive trend-level effect for diverse samples.

Child gender. Sixteen samples from eight studies were available for inclusion in an analysis of child gender as a moderator of the relationship between maternal employment and children's grades. First we examined studies that provided separate results for samples of boys and girls. Neither the interaction nor the individual effect sizes reached significance for boys or girls. However, there was a significant finding from the four studies that presented associations between a child gender variable (1 = girls, 0 = boys) and grades for children with working mothers. A small–moderate effect size ($r = .22$, $p = .048$) indicated that girls' grades were higher than boys' grades when mothers were employed.

Child age/grade. Studies were available for the two older age groups for examination in a test of the age/grade moderator. Although the moderator was not significant, there was a trend-level, negative point estimate for adolescent samples.

Separate Achievement Outcomes: Formal Tests of Intellectual Functioning

In the next set of analyses, children's scores on formal measures of verbal and spatial intellectual functioning were examined in relation to maternal employment (see Table 5). We examined overall intellectual performance, including formal measures of IQ and measures of verbal performance that correlate highly with verbal subscales of standard IQ tests (e.g., the PPVT). If total IQ scores were available, these scores were used in the analyses. If total scores were not reported, the software averaged verbal and spatial (or "performance") scores to yield one overall effect size (this calculation was necessary for two studies). In other cases, particularly for studies that used the NLSY, only verbal scores were available owing to reliance on the PPVT as the sole measure of intellectual functioning.

The overall effect with all available studies was not significant, nor were the effects with NLSY substitution. Adjusted effects from the trim and fill procedures were comparable to the unadjusted effects with and without NLSY substitution. Results of analyses using NLSY substitution are discussed below and presented in Table 5. The results utilizing all studies (not included in Table 5)

Table 4
Effect of Maternal Employment on Children's Grades

Outcome and moderators	Original studies k	r	95% CI	Q_w	No. studies filled	Trim and fill estimated[a] r	95% CI
Grades	16	.029	−.022, .079	164.29**	1	.010	−.051, .071

Moderators: Study characteristics[b]

	k	r	95% CI	Q_w	Q_b
Study quality: Source of sample					1.71
Sample of convenience	4	.161	−.200, .484	72.34**	
School/community	8	−.029	−.079, .022	16.13*	
Random/subset of random	4	.004	−.045, .054	28.44**	
Gender of first author					1.29
Male	9	.050	−.041, .141	142.58**	
Female	7	−.008	−.082, .132	1,758.42**	

	k	Slope	95% CI for slope
Year of publication	16	.003	−.0007, .007
Study quality: Journal impact score	13	.022	−.083, .126

Moderators: Sample characteristics

	k_s	r	95% CI	Q_w	Q_b
SES					2.45?
Working/lower middle	7	.104	−.188, .244	121.63**	
Middle/upper	5	−.024	−.015, .047	11.73**	
Mixed	3	−.008	−.095, .079	31.19**	
Race/ethnicity[c]					3.38†
Majority White	7	−.004	−.067, .059	20.26**	
Diverse	3	.175†	−.006, .345	114.38**	
Child gender					0.87
Boy	8	−.001	−.077, .075	29.55**	
Girl	8	.076	−.066, .215	127.08**	
Child age/Grade[d]					1.53
6–12 yrs/elementary	3	.224	−.168, .554	77.58**	
13–18 yrs/middle & high	13	−.023†	−.046, .083	27.73**	
Family structure[e]					0.91
Majority 2-parent	10	−.019	−.061, .023	20.22*	
Mixed 1- & 2-parent	4	.018	−.046, .083	30.49**	
Timing of maternal employment					0.93
Early	3	−.010	−.071, .051	11.35**	
Concurrent	16	.029	−.022, .079	164.29**	
Adjusted/unadjusted effect					1.13
Adjusted	11	−.005	−.063, .052	117.49**	
Unadjusted	8	.049	−.033, .131	48.94**	

Note. k = no. studies; k_s = no. independent subgroups or samples of children, except for timing of maternal employment and adjusted/unadjusted effect. Positive rs indicate that children of employed mothers had higher achievement than children of nonemployed mothers. CI = confidence interval; SES = socioeconomic status.
[a] Fixed effects trim and fill method; one study was trimmed to the right of the mean effect size; no studies were trimmed to the left of the mean effect size. When analyses were replicated using a random effects trim and fill method, six studies were trimmed, and the adjusted mean effect size was statistically significant in the direction of a small positive effect of maternal employment on children's grades.
[b] One National Longitudinal Survey of Youth study presented data for children's grades and is included in all analyses.
[c] The international, Black, and Hispanic levels are not included because each had fewer than three studies.
[d] For the age/grade moderator, the <6 yrs/preschool level is not presented because there were fewer than three samples; for the family structure moderator, majority one-parent level is not presented because there were fewer than three samples.
† $p < .10$. * $p < .05$. ** $p < .005$.

are presented below, except for the following moderators and point estimates, which were not significant: journal impact factor, gender of first author, SES, race/ethnicity, child gender, timing, and adjusted versus unadjusted effects.

NLSY status. NLSY status was not a significant moderator of associations between maternal employment and intellectual functioning. However, the individual point estimate was positive and significant for the NLSY studies but nonsignificant for non-NLSY studies.

Study quality. Type of research design was significant at a trend level ($k = 25$, $Q_b = 3.38$, $p = .066$) and produced a small, positive effect for the longitudinal samples ($k = 12$, $r = .026$, $p =$

.048); the effect for the cross-sectional samples was not significant ($k = 13$, $r = –.026$, *ns*). With NLSY-low and NLSY-high substituted, all effects became nonsignificant.

Source of sample was not significant when all eligible studies were included ($k = 25$, $Q_b = 1.90$, *ns*) but yielded a small, positive and significant effect for the random, or subset of random, samples ($k = 11$, $r = .021$, $p = .027$). Point estimates for the samples of convenience and school/community-based samples were not significant ($k = 3$, $r = –.144$, *ns*; $k = 11$, $r = –.014$, *ns*, respectively). All effects became nonsignificant with NLSY substitution.

Year of publication. The year in which studies were published was a significant moderator when all eligible studies were included, in the direction of more positive effects of maternal employment on intellectual functioning in studies published more recently ($k = 25$, $b = .003$, $p = .001$). This moderator remained significant when each of the NLSY studies was substituted.

Child age/grade. With all eligible studies, child age/grade significantly moderated the association between maternal employment and intellectual functioning ($k = 27$, $Q_b = 6.05$, $p = .048$). A significant negative effect emerged for the three studies with high school students ($r = –.122$, $p = .035$). Point estimates were not significant for the preschool studies ($k = 18$, $r = .019$, *ns*) or elementary school aged sample ($k = 6$, $r = .035$, *ns*). The pattern was replicated with NLSY substitution.

Family structure. This moderator was examined in majority two-parent and mixed one- and two-parent sample studies. With the remaining eligible studies, the family structure moderator was nearly significant ($k = 22$, $Q_b = 3.71$, $p = .054$) and indicated a small, positive effect for the mixed-sample studies ($k = 13$, $r = .028$, $p = .038$) but was nonsignificant in the majority two-parent samples ($k = 9$, $r = .054$, *ns*). All results fell short of significance with NLSY substitution.

Child care. The effect of adjusting for child care per se as compared with adjusting for other variables was not significant as a moderator ($k = 23$, $Q_b = 0.85$, *ns*), and neither was the point estimate for child care ($k = 3$, $r = .003$, *ns*); there was a trend for other adjusted effects ($k = 20$, $r = .024$, $p = .099$) when all eligible studies were included. Analyses could not be run with NLSY substitution, as four out of five studies in the child-care effects group were NLSY studies.

Separate Achievement Outcomes: Teacher Ratings of Cognitive Competence

Eight studies reported teacher ratings of children's cognitive competence. The weighted average correlation for the association between maternal employment and teacher ratings fell short of significance. Trim and fill analyses indicated that no studies needed to be trimmed and filled.

The small number of studies with teacher ratings limited the test of moderators; we were not able to test source of sample, gender of first author, race/ethnicity, child age/grade, family structure, timing of maternal employment, or adjustment for child care. No NLSY studies utilized teacher ratings as an outcome. None of the moderators that could be tested were significant: research design, journal impact factor, year of publication, SES, child gender, and adjusted versus unadjusted effects. Results for teacher ratings are displayed in Table 6.

A concise summary of the significant findings for employment versus nonemployment for all achievement outcomes is depicted in Table 7.[2]

Employment: Full-Time Versus Part-Time Contrasts

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 versus not employed and full-time versus not employed and (b) a full-time/part-time contrast (no nonemployed women). Because of the small number of available studies, achievement outcomes were combined for most of these analyses.

From the larger group of employed/not-employed effects, we identified the subset of studies that contrasted part-time and full-time employment with nonemployment. There were 23 different studies ($k_{studies} = 37$) that provided achievement data for children of part-time employed mothers compared with children of nonemployed mothers and for children of full-time employed mothers compared with children of nonemployed mothers. Two of these studies used the NLSY data set. The contrast was not significant ($Q_b = 1.84$, *ns*), nor were the individual effect sizes for part-time and full-time employment compared with nonemployment significant, although the association for part-time employment reached a trend level of significance (part-time, $k = 14$, $r = .042$, $p = .098$; full-time, $k = 23$, $r = –.005$, *ns*).

We were able to assess three of the separate achievement outcomes for the extent of employment contrast. When contrasted to the nonemployed group of mothers, all effects of part-time and full-time employment were not significant: formal achievement tests ($Q_b = 0.73$, *ns*; part-time: $k = 6$, $r = .034$, *ns*; full-time: $k = 11$, $r = –.056$, *ns*); grades ($Q_b = 0.001$, *ns*; part-time: $k = 5$, $r = .061$, *ns*; full-time: $k = 8$, $r = .063$, *ns*); and intellectual functioning ($Q_b = 2.03$, *ns*; part-time, $k = 5$, $r = .016$, *ns*; full-time, $k = 10$, $r = –.027$, *ns*).

Examined next were the studies that provided effects for a full-time/part-time variable (0 = full time, 1 = part time). Because of the small number of studies with a full-time/part-time variable, teacher ratings could not be examined separately. Findings indicated significantly more positive effects for children's achievement when mothers were working part time as compared with full time ($Q_w = 34.63$, $p = .002$; $k = 15$, $r = .059$, $p < .001$). Four of these studies used the NLSY data set; rerunning the analyses with NLSY-high and -low replicated these findings (for high: $k = 11$, $r = .086$; for low: $r = .080$; both ps $< .001$). When studies were examined separately by achievement outcome, we found consistent positive results for part-time compared with full-time employed mothers for formal achievement tests ($k = 7$, $r = .071$, $p = .048$), grades ($k = 5$, $r = .080$, $p = .040$), and formal tests of intellectual functioning ($k = 6$, $r = .043$, $p = .008$). Results of the extent of employment analyses are summarized in Table 7.

Discussion

Years of research about the nature of the associations between maternal employment and children's achievement have been beset

[2] We appreciate the action editor's and anonymous reviewers' suggestion of including a summary table.

Table 5
Effect of Maternal Employment on Formal Tests of Intellectual Functioning (IQ)

Outcomes and moderators	Original studies k	r	95% CI	Q_w	No. studies filled	Trim and fill estimated[a] r	95% CI
All IQ outcomes[b]	25	.008	−.016, .032	67.29**	3	.017	−.009, .043
All IQ outcomes[c]	17	−.015	−.061, .030	48.74**	2	−.003	−.050, .045
All IQ outcomes[d]	17	−.007	−.051, .037	61.95**	4	.023	−.023, .068

	k	r	95% CI	Q_w	Q_b
NLSY sample					2.15
Yes	9	.024*	.001, .046	15.90*	
No	16	−.017	−.065, .032	48.71**	

Moderators: study characteristics

	NLSY-low[c] k	r	95% CI	Q_w	Q_b	NLSY-high[d] k	r	95% CI	Q_w	Q_b
Study quality: Research design					0.33					1.61
Cross-sectional	13	−.026	−.075, .023	28.21**		13	−.026	−.075, .023	28.21*	
Longitudinal	4	.010	−.103, .123	17.43**		4	.036	−.046, .117	17.02*	
Study quality: Source of sample					0.85					2.11
Sample of convenience	3	−.144	−.459, .202	9.93*		3	−.144	−.459, .202	9.93*	
School/community	11	−.014	−.076, .049	35.63**		11	−.014	−.076, .049	35.63**	
Random/subset of random	3	.003	−.033, .039	0.72		3	.030	−.011, .070	4.84	
Gender of first author[e]										0.22
Male						3	−.034	−.145, .078	17.39**	
Female						14	−.004	−.058, .049	41.42**	

	k	Slope	95% CI for slope	k	Slope	95% CI for slope
Year of publication	17	.004*	.0008, .007	17	.004**	.001, .007
Study quality: Journal impact score	10	−.021	−.932, .065	10	−.032	−.079, .016

Moderators: Sample characteristics

	NLSY-low[c] k_s	r	95% CI	Q_w	Q_b	NLSY-high[d] k_s	r	95% CI	Q_w	Q_b
SES					0.82					0.81
Working/lower middle	4	.020	−.088, .128	15.94**		4	.020	−.088, .1280	15.94**	
Middle/upper	9	−.039	−.114, .036	21.79*		9	−.039	−.114, .036	21.79*	
Mixed	5	−.030	−.109, .049	12.69*		5	−.011	−.092, .070	24.14**	
Race/ethnicity[f]					0.19					0.79
80% or more White	9	−.031	−.086, .025	19.65**		8	−.033	−.094, .029	19.63**	
Diverse	5	−.007	−.115, .102	14.21**		6	.016	−.073, .105	24.76**	
International	3	−.004	−.186, .178	7.69*		3	−.004	−.065, .033	7.69*	
Child gender[g]					0.54					
Boy	6	−.045	−.152, .064	25.19**						
Girl	6	−.003	−.030, .021	1.35						
Child age/grade					4.98†					5.27†
<6 yrs/preschool	10	−.010	−.077, .057	27.13**		10	.008	−.049, .066	30.93**	
6–12 yrs/elementary	5	.034	−.044, .111	8.57†		5	.034	−.044, .111	8.57†	
13–18 yrs/middle & high	3	−.122*	−.232, −.009	4.46		3	−.122*	−.232, −.009	4.46	
Family structure[f]					1.51					3.10†
Majority 2-parent	9	−.054	−.132, .025	23.02**		9	−.054	−.132, .025	23.02**	
Mixed 1- & 2-parent	5	.024	−.072, .120	21.69**		5	.042	−.030, .115	22.08**	
Timing of maternal employment					3.01†					3.37†
Early	8	.048†	−.005, .101	25.52**		8	.048*	.009, .086	17.08**	
Concurrent	17	−.012	−.055, .030	48.90**		17	−.007	−.051, .037	61.95**	
Adjusted/unadjusted effect					0.36					0.19
Adjusted	11	−.001	−.071, .070	36.92**		11	.006	−.056, .067	36.51**	
Unadjusted	11	−.029	−.088, .030	33.12**		13	−.007	−.079, .050	71.57**	

Table 5 (*continued*)

	Moderators: Sample characteristics (*continued*)									
	NLSY-low[c]					NLSY-high[d]				
	k_s	r	95% CI	Q_w	Q_b	k_s	r	95% CI	Q_w	Q_b
Child care[h]					0.16					
Not adjusted for child care	20	.014	−.010, .037	68.25**						
Adjusted for child care	3	−.003	−.029, .036	0.55						

Note. k = no. studies; k_s = no. independent subgroups or samples of children, except for timing of maternal employment and adjusted/unadjusted effect. Positive rs indicate that children of employed mothers had higher intellectual functioning than children of nonemployed mothers. CI = confidence interval; NLSY = National Longitudinal Survey of Youth; SES = socioeconomic status.

[a] Fixed effects trim and fill method; studies were trimmed to the left of the mean effect size; no studies were trimmed to the right of the mean effect size. Results from the random effects trim and fill method were consistent and of comparable magnitude.

[b] All NLSY studies included in estimation of average effect size.

[c] All NLSY studies excluded except NLSY study with the most negative effect (NLSY-low).

[d] All NLSY studies excluded except NLSY study with the most positive effect (NLSY-high).

[e] For NLSY-low, there were too few studies with male first authors for analysis.

[f] For race/ethnicity moderator, the majority Black and Hispanic levels are not included because each had fewer than three studies; for the family structure moderator, majority one-parent level is not included because there were fewer than three studies.

[g] Only one NLSY study provided effects separately for boys and girls, and it is included in the analysis.

[h] Comparison is between adjusted effects without child care and adjusted effects including child care. There were too few studies providing effects adjusted for child care to exclude a low and high NLSY study.

$^{\dagger}p < .10$. $^{*}p < .05$. $^{**}p < .005$.

by inconsistent results and scant attention to the power of the findings. As Horwood and Fergusson described the state of the science in 1999,

> The literature on maternal labour force participation and academic achievement extends back over the past three decades, but the evidence from this literature has not led to any clear assessment of the extent to which maternal labour force participation has a detrimental or beneficial effect on child achievement. (Horwood & Fergusson, 1999, p. 1022).

We conducted the current meta-analysis of 68 studies to clarify the magnitude and direction of the relationship between mothers' work outside the home and children's achievement. Doing a meta-analysis forces researchers "to develop a certain intimacy" (R. Rosenthal & DiMatteo, 2001, p. 64) with research articles. In the process, a number of decisions that must be made when preparing data for a meta-analysis and variation in the resolutions of these decisions can explain why different researchers come to discrepant conclusions when conducting meta-analyses on roughly the same set of studies. One such area is the decision about which statistics to select within a study that has analyzed the variables in several ways.

For this meta-analysis, maternal employment variables were operationalized as any employment versus no employment as well as full-time compared with part-time and each compared with no employment. We selected statistics from studies that used maternal employment status or hours variables even when researchers included more complex ways to operationalize mothers' paid work outside the home. Proceeding as we did enabled us to address the key question "Is maternal employment relevant for children's achievement?" and allowed us to test effects over a broad expanse of time. By and large, when significant, effect sizes were very small in magnitude. In the analyses of moderators, the direction of significant effects tended to be positive, with a few notable exceptions for the SES, age of child, and race/ethnicity moderators.

When all achievement outcomes were combined and all eligible studies were included, there was a trend toward a small positive association between maternal employment and children's achievement. However, when the NLSY redundancy was managed by substituting the NLSY-low and NLSY-high studies, and again when fixed effect trim and fill analyses were conducted, the subsequent results did not reach significance or trend levels.

When each achievement outcome was examined separately, nonsignificant findings predominated. The nonsignificant findings for the effects of maternal employment on children's achievement were not an artifact of power, although power was reduced to some extent for the analyses of moderators. Power to detect small effects was adequate for combined and separate outcome analyses, and ranged from a low of .71 for formal achievement tests and teacher ratings to a high of .99 for grades, formal tests of intellectual functioning, and the combined achievement outcomes. Despite conventional wisdom to the contrary and years of conflicting empirical findings, whether a mother works outside the home does not portend negative consequences for children's achievement under most conditions. Indeed, there are a number of circumstances when maternal employment relates favorably to achievement. Moreover, the results of the analyses of moderators and extent of employment underscore the need to place maternal employment in a larger familial and social context.

Does Extent of Employment Matter?

A number of studies examined achievement outcomes for children by the extent of mothers' work outside the home, and this distinction was consequential for the achievement outcomes. Some studies compared part-time and full-time employed samples with nonemployed samples, and some contrasted only part-time and full-time samples. When achievement was compared between part-time and full-time employment, higher achievement was found for

Table 6
Effect of Maternal Employment on Teacher's Ratings

Outcome and moderators	Original studies				No. studies filled	Trim and fill estimated[a]	
	k	*r*	95% CI	Q_w		*r*	95% CI
Teacher ratings	8	.070†	−.008, .147	14.13*	1	−.017	−.051, .071
Moderators: Study Characteristics[b]							
	k	*r*	95% CI	Q_w		Q_h	
Study quality: Research design						0.38	
Cross-sectional	5	.051	−.047, .148	8.50†			
Longitudinal	3	.109	−.048, .260	5.11†			
	k	Slope	95% CI for slope				
Year of publication	8	.001	−.005,.007				
Study quality: Journal impact score	6	.002	−.095,.010				
Moderators: Sample Characteristics							
	k_s	*r*	95% CI	Q_w		Q_h	
SES[c]						0.50	
Middle/high	3	.104	−.022, .227	0.32			
Mixed	4	.031	−.129, .189	12.41*			
Child gender						0.38	
Boy	3	.090	−.074, .249	3.05			
Girl	3	.165†	−.011, .331	3.34			

Note. k = no. studies; k_s = no. independent subgroups or samples of children, except for timing of maternal employment and adjusted/unadjusted effect. Positive *r*s indicate that children of employed mothers had higher achievement than children of nonemployed mothers. CI = confidence interval; SES = socioeconomic status.
[a] Fixed effects trim and fill method; one study was trimmed to the right of the mean effect size; no studies were trimmed to the left of the mean effect size. Results from the random effects trim and fill method were consistent and of comparable magnitude.
[b] No National Longitudinal Survey of Youth studies presented data for teacher ratings.
[c] For the SES moderator, the level working/middle is not presented because there were too few studies presenting grades for this group.
†$p < .10$. *$p < .05$. **$p < .005$.

children of part-time as compared with full-time workers. Although the direction of effects is consistent with expectations based on previous research (Bronfenbrenner & Crouter, 1982), we caution that not all part-time/full-time contrasts produced significant results, and those that did were small in magnitude ($r < .10$).

Several explanations for the full-time/part-time differences are plausible, including the proximal reason of the potential for increased maternal supervision in families with part-time employed mothers. Considering the larger family context, factors such as fathers' work patterns and the income paternal work generates impinge on the need for maternal labor. Changes in fathers' labor force participation can motivate changes in mothers' work status and hours. Some mothers work part time involuntarily and would be employed full time if they could. When mothers work part time by choice, it may be an indicator of higher family income and favorable income-to-need conditions. The situation of upper-middle and upper class families in which mothers work part time by choice is strikingly different from the situation of dual-worker families in which both parents are employed full time to make ends meet. To the extent that the part-time samples are composed of women who are married and who choose to be—and can afford to be—employed part time, greater economic and material advantages may characterize these families compared with families with women employed full time because they cannot afford *not* to work. If part-time employment is a proxy for contextual and family characteristics that benefit children, then caution needs to be exercised before attributing favorable achievement outcomes to the mothers' employment status without consideration of how employment status interacts with marital status, family income, and race/ethnicity to create differing ecological niches.

Was Publication Bias a Problem?

Most of the studies used in this meta-analysis were from published articles or chapters, which carry the threat of bias toward statistical significance. The adjusted effects of maternal employment on children's achievement from the fixed effects trim and fill procedures (often the preferred method; Duval, 2005) were always of the same magnitude as the unadjusted effects. The effects from the random effects trim and fill method were comparable except when all outcomes were combined and for grades; in these instances, there was a significant, small, positive association between maternal employment and children's achievement. It is important to note that neither of these two approaches suggested a negative effect of maternal employment on children's achievement.

Table 7
Summary of Results for Effects of Maternal Employment on Children's Achievement

Contrasts and moderators	All outcomes combined[a]	
	All studies	NLSY-low or -high
Employment vs. no employment ($k = 57$)[b]	NE	NE
Part-time employment vs. no employment ($k = 14$)	$p^{\dagger}$	—
Full-time employment vs. no employment ($k = 23$)	NE	—
Part-time vs. full-time employment ($k = 15$)[c]	p^{*}	p^{*}
Moderators of the effect of maternal employment (vs. no employment) on children's achievement outcomes		
NLSY sample	NE	
Yes	NE	
No	NE	
Research design	—	NE
Cross-sectional	NE	NE
Longitudinal	p^{*}	p^{*}
Source of sample	NE	NE
Sample of convenience	NE	NE
School/community	NE	NE
Random/subset of random	NE	NE
Journal impact score	NE	NE
Gender of first author	NE	NE
Male	p^{*}	p^{*}
Female	NE	NE
Year of publication[d]	p^{*}	p^{*}
SES	1^{*}	$I^{\dagger}$
Working/lower middle	NE	NE
Middle/upper	$n^{\dagger}$	$n^{\dagger}$
Mixed	NE	NE
Race/ethnicity	1^{*}	I^{*}
80% or more White	$n^{\dagger}$	$n^{\dagger}$
80% or more Black	NE	NE
80% or more Hispanic	NE	—
Diverse (no 80% majority)	p^{*}	p^{*}
International	p^{*}	p^{*}
Child gender[e]	NE	
Boy	NE	—
Girl	p^{*}	—
Child age/grade	NE	NE
<6 yrs/preschool	$p^{\dagger}$	NE
6–12 yrs/elementary	p^{*}	p^{*}
13–18 yrs/middle & high	NE	NE
Family structure	I^{*}	I^{*}
Majority 2 parent	NE	NE
Majority 1 parent	p^{*}	p^{*}
Mixed 1 & 2 parent	p^{*}	p^{*}
Timing of maternal employment	$I^{\dagger}$	NE
Early	NE	NE
Concurrent	$p^{\dagger}$	NE
Type of effect	NE	NE
Adjusted	NE	NE
Unadjusted	NE	NE
Adjusted for child care	NE	NE
Yes	NE	NE
No	NE	NE

Note. $I^{*}(^{\dagger})$: significant (or trend) interaction between moderator and maternal employment; $p^{*}(^{\dagger})$: significant (or trend) positive effect of maternal employment on children's achievement outcome; $n^{*}(^{\dagger})$: significant (or trend) negative effect of maternal employment on children's achievement; NE: no statistically discernable effect of employment on achievement or the variable is not a significant moderator; —: too few studies available for analysis. NLSY = National Longitudinal Survey of Youth; SES = socioeconomic status.

[a] k is for all studies included; k is reduced when NLSY-low or NLSY-high is substituted.

[b] Adjusted effect from a fixed effects trim and fill method.

[c] p^{*} indicates the achievement of children with part-time employed mothers was significantly higher than that of children with full-time employed mothers.

[d] p^{*} indicates a significant positive slope between effect size and year of publication of study—that is, more positive effects of maternal employment on children's achievement are associated with recently published studies.

[e] Additional contrasts between boys and girls among employed mothers only are presented in the text of the Results.

Although publication bias is one possible cause of asymmetry in a funnel plot and might explain the differences between the fixed and random effects trim and fill results when all outcomes were combined and for grades, another important potential source of asymmetry is true heterogeneity (Sterne, Becker, & Egger, 2005). Research has suggested that when heterogeneity among the effect sizes is large, the trim and fill procedure may adjust for publication bias when none is present (Sterne, Gavaghan, & Egger, 2000; Terrin, Schmid, Lau, & Olkin, 2003). Indeed, when one outlying study was omitted from the analysis of grades, the results from the fixed and random effects trim and fill procedures were consistent with the nonsignificant, unadjusted effect of maternal employment on children's grades. As such, the large heterogeneity among the effect sizes in these two instances may pose a plausible alternative explanation to the existence of publication bias.

Moderators

When the separate impact of the sample-level moderators was considered, more associations between maternal employment and children's achievement were positive when samples had one-parent families or mixed one- and two-parent families, were racially/ethnically diverse (no 80% racial/ethnic majority), or were international (non-U.S.); when children were school aged; and when children were female. More associations were negative when samples were 80% or more White or middle/upper-middle class and when achievement was measured in adolescence. At the study level, positive associations between maternal employment and achievement emerged most frequently when research designs were longitudinal, studies were published in higher impact journals, first authors were male, and studies were published more recently.

Study-Level Moderators

The importance of being NLSY. A subset of 19 studies in the current meta-analysis drew on the richness of the NLSY nationally representative data set. We took care to avoid redundancy when conducting the meta-analysis by utilizing a representative NLSY study. The designated studies varied among the analyses but always captured the low and high ends of the range of effect sizes for the NLSY studies in an analysis. Removing the NLSY redundancy did attenuate a number of the findings and, at times, revealed a significant finding that was not apparent in the full sample analyses.

Additionally, to provide a comprehensive examination of the contributions of the NLSY studies to the literature on maternal employment and achievement, we tested NLSY status as a moderator for the combined achievement outcomes and for the separate outcomes of formal tests of achievement and intellectual functioning. Although the NLSY studies differed in key ways from many of the other studies in the meta-analysis (e.g., sample size, ethnic composition of sample, SES of sample), NLSY status was never a significant moderator of the association between maternal employment and achievement. The only significant individual finding was for a very small, positive point estimate for the NLSY study samples when intellectual functioning was the outcome.

Do observed effects of maternal employment differ by study quality? Study quality as a moderator of effects was examined in three ways: study design, source of sample, and journal impact factor. Study design did not significantly moderate the relation between maternal employment and children's achievement. Although both longitudinal and cross-sectional studies yielded positive effects of maternal employment on children's achievement, only the point estimates for the longitudinal studies reached significance. The large national longitudinal studies, such as those based on NLSY and the National Institute of Child Health and Human Development (NICHD) Study of Early Child Care data sets, may have contributed to the larger effects for longitudinal designs as compared with cross-sectional studies. These studies were also noteworthy for the source of their study sample being random or a subset of random. Thus, effect sizes from these studies may have contributed to the one small, positive effect found for random samples for intellectual functioning.

Most of the articles that were published in refereed journals were able to have a journal impact factor assigned to them. This continuous moderator was significant only for formal achievement tests, where more positive effects of maternal employment emerged for studies published in journals designated as having greater impact.

Do observed effects of maternal employment differ by gender of first author and year of publication? Gender of first author was not a significant moderator of associations between maternal employment and achievement, although the analysis of combined achievement outcomes indicated a very small, positive individual effect for male first-authored studies only. Therefore, it is reasonable to conclude that gender of first author is incidental to the nature of the outcomes of research in this area. Most important, the direction of the significant effect fails to endorse notions that female researchers, who themselves may be "working mothers," are biased to portray maternal employment in a glowing light.

A contribution of the current meta-analysis is that it spans more than four decades of research. Although not a perfect proxy for time period of data collection and attendant norms for maternal employment, year of publication was used to test historical differences in the associations between maternal employment and achievement. The main pattern that emerged was one of more positive effect sizes for studies published in recent years as compared with studies published decades ago (for all achievement outcomes combined and for formal tests of intellectual functioning). This pattern may reflect the dramatic shifts in the normalcy of maternal employment across the decades spanned by the meta-analysis. Also, over the years, more rigorous research designs and more complex quantitative methods have become more widely adopted.

Is it consequential to control for background, contextual, and child-care variables? Meta-analyses were conducted to examine the effects on associations between maternal employment and achievement of adjusting for general background and contextual variables versus not making these adjustments, and to investigate the impact of controlling specifically for child care compared with adjusting for effects of other variables. Whether the effects were adjusted did not emerge as a significant moderator in any of the analyses.

Effect sizes that were adjusted for child care were contrasted to those that were not adjusted for child care (but were adjusted for other variables) for formal tests of intellectual functioning and all achievement outcomes combined. The child-care moderator was not significant in the small number of studies that provided effects

adjusted for the presence and type of child care. We emphasize that we were unable to examine fully what moderator role specific dimensions of child care play as 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 effects between maternal employment and achievement under conditions of high-quality care and more negative effects when there was low-quality care (e.g., Peisner-Feinberg et al., 2001).

On balance, adjusting for background or contextual variables at a general level did not alter associations between maternal employment and children's achievement. The purpose of adjusting for covariates is to account for confounding factors, which generally produces an effect smaller than the unadjusted effect. Because most of the unadjusted effects were nonsignificant, there was no apparent difference between the adjusted and unadjusted effects. It may be useful in future research to separately examine effects that have been adjusted for different sets of contextual variables, including child care. Also, we suggest including parental monitoring and supervision (e.g., Crouter et al., 1990), in addition to nonmaternal child care, as a way to include studies with older children.

Sample-Level Moderators

Do children in working/lower-middle classes benefit more from maternal employment than children in the middle/upper-middle classes? On the basis of prior research and qualitative reviews of the literature, we expected more beneficial effects of maternal employment for working/lower-middle-class children when compared with middle/upper-middle-class children and mixed-class samples; this expectation received some support. When all achievement outcomes were combined, the SES moderator was significant and individual point estimates indicated a small but negative trend in the middle/upper-middle-class samples. When the SES moderator was tested separately by achievement outcome, it no longer moderated the association between maternal employment and achievement.

Because of the additional resources afforded by the income brought by maternal paid work, children in working-class samples were expected to benefit from maternal employment (Beyer, 1995; Hoffman, 1984). In contrast, in middle/upper-middle-class samples where maternal employment is not a financial necessity, children may be adversely affected by the lessened maternal supervision resulting from maternal employment (Hoffman & Youngblade, 1999). We also note that more than half of the middle/upper-middle-class samples were White, which makes it difficult to truly disentangle the effects of race/ethnicity and SES. Thus, this meta-analysis provides partial support for the importance of SES in that there were significant detrimental effects in middle/upper-middle-class samples. A number of researchers (Banducci, 1967; Cherry & Eaton, 1977; Gold & Andres, 1978b, 1978c; Rees & Palmer, 1970) have posited what constitutes a social class by gender interaction, such that maternal employment is worse for the achievement of boys in middle/upper-middle-class families; this higher order interaction may be valuable to examine in future quantitative reviews.

Do employment and achievement effects operate similarly for children from different racial/ethnic backgrounds? There was some indication that maternal employment operates differently in the racial/ethnic groups, especially when all achievement outcomes were combined and for formal achievement tests and grades. However, the magnitude of the effect of the race/ethnicity moderator was small, as were the individual effects for the racial/ethnic groups. This apparent mitigated salience of the race/ethnicity moderator confirms Hoffman and Youngblade's (1999) observation that race/ethnicity plays an "equivocal" role as a moderator. This statement does not mean that race/ethnicity is of no consequence; of importance, the only negative point estimates were found in majority White samples, and beneficial effects were more likely to be evident in international samples and racially/ethnically diverse samples. The samples that were racially/ethnically diverse were also heterogeneous in terms of SES and family structure; hence, it is not clear that differences in any one of these characteristics can account for these findings. One might argue that the samples without a racial/ethnic majority, as they are also mixed in SES and family structure, are most representative of the larger U.S. society and that the small, favorable effect may generalize to this larger context. The positive effects for the international samples may reflect the macrosystem national policies that are in place in many other countries to support families through generous paid parental leaves and similar family-friendly policies.

A positive association between maternal employment and achievement for Black children was expected because of the long tradition of paid employment outside the home among Black American women that has made this pattern normative (U.S. Census Bureau, 2002). Although the point estimates for majority Black samples were positively signed, the small number of majority Black samples, especially in the separate outcome analyses, may have reduced the power to detect significant differences. In addition, changing demographics in the ethnic profile of the United States may produce more studies with majority Hispanic samples to permit a fuller examination in the future of maternal employment and children's development for this ethnic group.

Does maternal employment benefit daughters more than sons? A sufficient number of studies were available to test child gender as a moderator for all achievement outcomes combined, and separately for each achievement outcome. Although the interactions were not significant, a number of the individual point estimates were consistent with some past research that showed more positive results for girls. When significant effects were detected (all achievement outcomes combined, formal achievement tests, grades, and teacher ratings), they were in the direction of positive effects for samples of girls, and effects favored girls when gender of child was examined in the subsample of employed mothers. Effects were small to small–moderate in size (up to $r = .22$). Notably, the pattern of significant negative effects for girls and significant positive effects for boys was not observed in any analyses.

The gender-of-child findings are consistent with the explanation that mothers who work provide a positive role model for high aspirations and achievement among their daughters and allow girls more independence than do nonemployed mothers (Hoffman, 1980, 1984). However, the small number of significant differences and the magnitude of the effect sizes, although among the highest in the meta-analysis, indicate that the social address of maternal employment status falls short of a full explanation for girls' achievement. Other factors, even employment-related matters such

as mothers' attitudes toward paid work, likely are important factors to consider.

Do younger children fare worse when their mothers are employed compared with older children? Three age/grade groups were examined in the meta-analysis: preschool, elementary school, and middle or high school. Tests were conducted of the age/grade moderator for the combined achievement outcomes, formal achievement tests, and formal tests of intellectual functioning. There was no support for the expectation that younger children would fare worse than older children when their mothers were employed. Age/grade significantly moderated the association between maternal employment and intellectual functioning when all samples were included (this moderator reduced to a trend level of significance with NLSY substitution). The only significant effect was for the middle/high school children, and it was negative.

The negative effect for the adolescent age group is consistent with the position that less parental supervision may characterize families with employed mothers (Bronfenbrenner & Crouter, 1982; Montemayor & Clayton, 1983; Muller, 1995). It may also be a call for social interventions for this age group. Adolescents, who are too old for traditional child care and who may have more diversionary activities at their disposal than younger children, need structured activities after school and access to affordable, high-quality after-school programs (Vandell, Pierce, & Dadisman, 2005) in order to stay on track with their academics.

When all achievement outcomes were combined, there was a significant positive effect evident for school-age children, but the moderator itself was not significant. No significant effects were apparent for the preschool-age children; even when all outcomes were combined, the effects were negligible. Thus, results from analyses of the age/grade moderator challenge conventional wisdom that maternal employment is harmful for young children and provide some support for beneficial effects for school-age children. In the future, as successive waves of data become available from several of the national longitudinal studies (e.g., NLSY, NICHD), there should be rich opportunities to study the long-term effects of maternal employment on young adults' achievement (Baum, 2004), extending our understanding of how maternal employment is associated with achievement beyond childhood and adolescence.

Are the effects of maternal employment on achievement different for children who live in one-parent or two-parent families? Family structure emerged as one of the more important moderators of associations between maternal employment and achievement. It was a significant moderator when all achievement outcomes were combined and was replicated with NLSY substitution. Significant positive effects were observed only in the one-parent samples and mixed one- and two-parent samples. When outcomes were restricted to formal tests of achievement and intellectual functioning, similar patterns resulted. Although one-parent, mother-headed families become vulnerable to financial strain and its adverse correlates for parents and children when their income-to-needs ratio is not adequate (Gutman, McLoyd, & Tokoyawa, 2005; Jackson, Brooks-Gunn, Huang, & Glassman, 2000), maternal employment under conditions of a one-parent family structure does not appear to be a risk factor for children's lower achievement. In fact, the achievement of children in families with only one parent, who is usually both primary caregiver and breadwinner, appears to benefit from the increased economic resources. The importance of the family structure moderator calls attention to the need to examine the larger context of maternal employment.

Does maternal employment early in a child's life exert an effect different from concurrent maternal employment? There were no significant differences in the effect of the timing of maternal employment as a moderator for the study outcomes. The moderator and the positive point estimate for concurrent studies only reached a trend level of significance when all studies were included, and there was one significant positive point estimate for early timing when formal tests of intelligence were the outcome; otherwise, nonsignificant findings predominated.

Discrepancies between results from some individual studies and the meta-analytic findings may be attributed in part to variability in how the timing of early maternal employment was operationalized in the contributing studies (e.g., at 3 months, at 9 months, at 1 year, during the first 3 years) and the variation in the time between the assessment of employment and the achievement outcomes. Moreover, there was a wide range of both positive and negative effects from the individual studies presenting early effects of maternal employment. Perhaps early and concurrent maternal employment should be examined in concert with other moderators, such as child gender or SES, before one concludes that the timing of maternal employment is of little import for children's achievement. For example, Waldfogel and colleagues (2002) reported that controlling for family characteristics reduced the adverse effects of early maternal employment on some cognitive outcomes. In addition, careful attention should be paid to how "early" is operationalized to fully understand the interplay between mothers' return to work and children's later achievement.

Limitations and Future Directions

A majority of the research that focuses on the relationship between maternal employment and children's achievement is quasi-experimental, or more broadly defined as correlational in nature, and we do not know whether the very small differences in achievement were actually *caused* by mothers' work. There are no doubt more complex causal mechanisms that might operate to help explain the nature of the association between maternal employment and achievement that we were unable to test in the present meta-analysis. Identifying and testing mediators would help elucidate the mechanisms by which maternal employment operates to affect children's achievement. For example, a small number of studies presented effects adjusted for child care, and although we were able to test for the presence of child care as a moderator, we were unable to test whether quality of child care acts as a potential moderator or mediator of the relationship between mothers' work and children's achievement.

In the current meta-analysis, maternal employment was operationalized using employed (including full and part time) versus not employed, continuous hours of work, and extent of employment (part vs. full time). Other conceptualizations of maternal employment (e.g., timing of entry or reentry into the labor force, intermittent or continuous employment, weeks of the year worked, overtime vs. full time, maternal satisfaction with employment) were available in some of the studies that met criteria for inclusion and in some of the studies that were not included in the present meta-analysis. Future research might include these variables and

might test for curvilinear relationships between hours worked and achievement in studies that provide findings based on a continuous hours of employment variable. Several key achievement outcomes were included in the meta-analysis, but one aspect not studied was high school completion (e.g., Haveman, Wolfe, & Spaulding, 1991; Wolfer & Moen, 1996), which might be useful to include in future reviews. Also potentially informative for future meta-analyses would be fathers' employment, either as a separate source of influence on children's achievement or in conjunction with maternal employment (e.g., Hoffman & Youngblade, 1999).

Implications and Conclusion

Many of the sample sizes in the individual studies were rather large, thus enabling us to find statistically significant results with small effect sizes. Whether small effects are of practical import is debatable; in some situations small effects can be very important, with far-reaching consequences. Given the relevance of the achievement outcomes to education, it is reasonable to compare the effect sizes in our study with those deemed reasonable in that field. Recently, educators concluded that reasonable effect sizes for the impact of instructional processes on student learning and achievement appear to be on the order of 0.1 standard deviation (in a *d*-type effect size metric) and may be smaller during the high school years (Lanahan, McGrath, McLaughlin, Burian-Fitzgerald, & Salganik, 2005). Thus, the mere fact of a small effect does not mean it is trivial in importance, and as such, we do not diminish the importance of the small effects observed here. Moreover, the significant effects usually were in the direction of a favorable effect of maternal employment on children's achievement. The results of this meta-analysis, therefore, may serve to quell some of the concerns raised about the fact of mothers' working for children's achievement.

Our results also point to the need to view maternal employment in a broad, multifaceted social context. SES, race/ethnicity, children's age, family structure, and timing of maternal employment each significantly moderated the associations between maternal employment and at least one measure of achievement, but no single contextual moderator dominated the findings. This pattern of a collection of sample-level moderators that exert a significant, small effect speaks to the complex interplay among individual, family, work, and societal characteristics. As well, the family situations that allow part-time employment may be driving the benefits evident for this work status. Researchers must continue to consider the historical and sociocultural contexts in which work and family occur (Johnson et al., 2003).

As we study parental employment in broader social, cultural, and historical contexts and merge perspectives from different disciplines, we will get closer to the goal of having "integrative theories and research designs that mirror the realities and complexities of our work and family lives" (Perry-Jenkins, Repetti, & Crouter, 2000, p. 994). Society at large will benefit if these theoretical and empirical advances are used to further the development of programs and policies that support children and "families that work."

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Received October 27, 2005
Revision received June 14, 2007
Accepted July 23, 2007 ■