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Early Maternal Employment and Children's Academic and Behavioral Skills in Australia and the United Kingdom

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This study assessed the links between early maternal employment and children's later academic and behavioral skills in Australia and the United Kingdom. Using representative samples of children born in each country from 2000 to 2004 (Australia $N = 5{,}093$, U.K. $N = 18{,}497$), OLS regression models weighted with propensity scores assessed links between maternal employment in the 2 years after childbearing and children's skills in first grade. There were neutral associations between maternal employment and children's first-grade skills in both countries. However, there was a slight indication that more time away from parenting was negatively linked to children's behavioral functioning in Australia and employment begun between 9 and 24 months was positively linked to cognitive skills for U.K. children of low-wage mothers.

The past decades' increase in employment among mothers with young children has been one of the most significant recent demographic shifts in family life. Early maternal employment serves many different purposes for families, including supporting women's careers, encouraging more balanced gender roles within families, and increasing families' economic resources (Gornick & Meyers, 2003). Many families rely heavily, or even exclusively, on earnings from mothers' employment due, in part, to declines in male earnings and increases in single-mother families (Haskins, 2006). Yet concerns remain that early maternal employment might inhibit children's healthy development by decreasing mothers' time and energy to devote to parenting or increasing nonparental care (Becker & Tomes, 1986; Bowlby, 1951). Although most countries have responded to these employment trends with paid parental leave policies, many new mothers still return to work soon after childbirth, juggling the demands of employment and parenthood.

The implications of such choices for children's healthy development may vary across countries with different policy and cultural contexts for new parents. The majority of research has focused on one policy and cultural context: the United States. Yet, the United States has arguably the most limited parental leave policies of any industrialized country as well as high rates of single-mother families, and the U.S. subsequently experiences unusually high rates of very early returns to the labor market following childbirth (Kamerman, 2000; Ruhm, 2011). Therefore, findings from the United States may not generalize to other countries. On the other hand, if findings from the United States do generalize to other countries, this pattern is theoretically important for understanding the relation between maternal employment and child development.

The goal of the current article is to delineate the repercussions of early maternal employment for children's later academic and behavioral skills in two countries with similar economic structures to the United States but differing cultural expectations and policy environments for young families, most notably parental leave policies: Australia and the United Kingdom. We take advantage of longitudinal surveys from each country that follow nationally representative samples of children from birth until entry into formal schooling. Each survey

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includes comparable information on mothers' employment after childbirth and children's cognitive and behavioral skills at first grade. We focus on these skills due to their importance in setting children up for trajectories of success (Shonkoff & Phillips, 2000). Essential skills after entry into formal schooling include core early literacy and numeracy skills, as well as skills in regulating inappropriate behaviors (Entwisle & Alexander, 1993). Starting school with these early competencies supports the successful transition to schooling, heightens the likelihood of future educational success, and in turn supports positive economic and psychological functioning into adulthood (Heckman, 2000).

Theoretical Frameworks and Empirical Evidence

Social science theories suggest a variety of hypotheses regarding the potential repercussions of maternal employment for young children. Developmental and economic perspectives suggest that maternal employment may be harmful because it limits mothers' time and energy to devote to parenting, hampers child attachment, or leads to the use of alternate care settings less supportive for children's development (Becker & Tomes, 1986; Bowlby, 1951). Yet these models also suggest that maternal employment brings economic and social resources to families, which should benefit children's development (Hoffman & Youngblade, 1999).

Taken together, these theoretical perspectives argue for counteracting mediational processes, suggesting that maternal employment will not only increase economic resources but also reduce mothers' time devoted to parenting. Infants, who have high care demands and who are still building secure child–parent attachments, may be most impacted by mothers' limited time, pushing the balance between these competing forces into a net negative effect. On the other hand, with changing cultural norms and support from employment policies, fathers, and child-care providers, the negative implications of reduced maternal time may have dissipated, whereas the benefits of additional income may have risen for contemporary children of mothers who return to work after childbirth.

These mediational hypotheses assume that all women respond to employment in a universal and consistent manner, a suspect assumption. An alternate model accounts for individual differences in employment experiences by proposing that money and time processes may serve as moderators of early maternal employment. Working mothers earn different salaries and spend differing amounts of time on work versus parenting (Coley, Lohman, Votruba-Drzal, Pittman, & Chase-Lansdale, 2007; Hoffman & Youngblade, 1999; Parcel & Menaghan, 1997). We hypothesize there could be few negative implications, and perhaps even positive benefits, for children of mothers who return to work soon after childbirth but contribute more financially to the family or are able to protect parenting time with their infant. In contrast, for children of mothers whose early returns to work contribute less financial resources or require extensive time away, early employment may be detrimental. This framework suggests that time and money may serve as important moderators of links between early maternal employment and child well-being.

A sizable body of empirical evidence using large, longitudinal survey studies of U.S. children has generated conflicting findings about the implications of maternal employment in the first 2 years after childbirth for children's long-term development. A number of studies of children born in the 1980s and early 1990s found negative associations (Baydar & Brooks-Gunn, 1991; Berger, Hill, & Waldfogel, 2005; Brooks-Gunn, Han, & Waldfogel, 2002, 2010; Han, Waldfogel, & Brooks-Gunn, 2001; Hill, Waldfogel, Brooks-Gunn, & Han, 2005). For example, assessing a sample of White children from the NICHD-SECC, Brooks-Gunn et al. (2002) found that maternal employment begun before the child's 9th month was linked to lower child cognitive skills at 36 months. This pattern continued into the first grade, extending to children's behavioral functioning as well (Brooks-Gunn et al., 2010). Research with a nationally representative sample of mothers, the *NLSY-CS*, has unearthed similar patterns (Han et al., 2001; Hill et al., 2005). In contrast, at least one study using a more contemporary nationally representative sample of children born in 2001 found no links between maternal employment begun by 9 months or 24 months after childbirth and children's cognitive and behavioral skills in kindergarten (Lombardi & Coley, 2014).

A handful of studies from the United States have assessed whether maternal time and money mediate or moderate the associations between early maternal employment and children's cognitive and behavioral skills. This research has found little evidence to suggest that time or money play a mediational role. Maternal time has not been found to mediate associations, whether measured by child-care hours (Lombardi & Coley, 2014), child-care type (Baydar & Brooks-Gunn, 1991; Berger, Brooks-Gunn, Paxson, & Waldfogel, 2008; Han et al., 2001), or child-care quality (Brooks-Gunn et al., 2002, 2010). Similarly, maternal earnings did not mediate

associations between early maternal employment and child functioning in recent studies (Brooks-Gunn et al., 2010; Lombardi & Coley, 2014).

More conflicting findings have emerged from studies that assessed maternal time and money as moderators of these associations. With regard to time, one study found that full-time maternal employment in the 1st year was more strongly linked to decreased child functioning than part-time early employment (Brooks-Gunn et al., 2002), whereas a more recent study found slight evidence of negative associations with early part-time entries into work (Lombardi & Coley, 2014). We know of only one study assessing the moderational role of maternal employment earnings that found no interactive associations with children's school readiness (Lombardi & Coley, 2014). Although not directly testing the moderating role of money, other studies focusing solely on low-income U.S. families have found positive associations of early maternal employment for children's development (Berger et al., 2008; Coley & Lombardi, 2013), suggesting that early maternal employment may be more beneficial in families in which mothers' earnings contribute more to total family income (see also Lombardi & Coley, 2014).

Addressing the Role of Early Maternal Employment in Different Contexts

This study examines the associations between early maternal employment and children's development in two different national contexts. Australia and the United Kingdom were chosen due to the availability of nationally representative surveys that are similar to the longitudinal survey studies used in the U.S. research and to contrasting policy and social contexts. Australia and the United Kingdom have many similarities to the United States, but differ notably on the policies available to parents with young children. The policy context in the two countries is presented in Table 1. Australia has long offered 12 months of unpaid parental leave for working mothers along with a sizable cash payment to all families upon the birth of a child (further policy expansions, after the cohort assessed in the current study, are noted in Table 1). Child care is supplied by both public and private providers with the cost of center-based care subsidized by the federal government up to 50% (Australian Government Family Assistance Office, 2011). The U.K. witnessed a dramatic expansion in services for families with young children starting in the early 2000s. From 1999 through 2001, which covers the period of time in which children in this study were born, all mothers were eligible for 18 weeks of paid parental leave and women who had worked for the same employer for a year or longer were eligible for an additional period of 29 weeks of unpaid leave (Waldfogel, 2010). Further leave expansions are noted in Table 1. These reforms also included an increase in the number of child-care providers and an expansion of child-care

Table 1
Federal Family Policies in Australia and the United Kingdom at the Time of Survey Children's Birth[a]

	Australia	U.K.
Paid maternal leave	None[b]	18 weeks paid leave; 6 weeks at 90% of full pay, remainder at flat rate[c]
Unpaid maternal leave	52 weeks unpaid leave for mothers who have worked 12+ months for employer	Mothers employed by same employer for year+ eligible for additional 29 weeks unpaid leave[d]
Paternal leave	3 weeks of unpaid leave	None
Child-care benefits	Child-care benefit provides payment to help with costs; child-care rebate covers up to 50% of costs	Provided to all low-income children < 3 years
Health insurance	Universal insurance	Universal insurance
Child cash payments	Baby bonus provides $5,000 one-time payment; family tax benefit offers annual support to low-income families	The child tax credit and a payment upon the birth of a child are available for low-income families
Minimum wage (annual wage in US $)	$22,148	$13,658

[a]Children in Australia were born between March 2003 and February 2004. Children in the United Kingdom were born between September 2000 and January 2002. [b]In 2011, Australia implemented a federal policy providing 18 weeks of paid leave. [c]Paid leave in the United Kingdom was extended to 6 months in 2002 and to 9 months in 2010. [d]In 2002, unpaid leave was extended to 12 months in the United Kingdom (including months of paid leave).
Sources. Australian Government Family Assistance Office (2011), OECD Family Database (2011), U.K. Government (2010), Waldfogel (2010).

tax credits (Waldfogel, 2010). Related in part to varying policy frameworks for working parents, the cultural norms for working mothers also vary across countries. Prior research has found that both U.K. and Australian mothers return to work later and at a lower intensity in comparison to American mothers (Coley, Lombardi, Sims, & Votrbua-Drzal, 2013; Crosby & Hawkes, 2007).

Due to these differences in policy supports and cultural norms surrounding mothers' work, it is possible to hypothesize that the implications of early maternal employment may have both similarities and differences across countries. On one hand, the timing of entry into employment may have similar implications for children's long-term development across countries. Based on theoretical models of child development posited to operate universally across diverse families, mothers who return to work early will experience similar economic benefits and similar negative taxes on time and energy to devote to parenting, leading to parallel null findings in which these processes cancel each other out (Becker & Tomes, 1986; Bowlby, 1951). Similarly, the moderating role of individual differences would be expected to operate in a similar way across countries. That is, greater earnings and less of a time loss should support child functioning across contexts. Similar results in other countries would suggest that the implications of early maternal employment extend beyond American children and families. In contrast, due to differences in policy supports and cultural norms, the counteracting mediational processes might be different. Because Australia and the United Kingdom offer options and incentives for mothers to remain out of the labor force through paid and unpaid leave, and have cultural norms promoting longer leaves, it could be hypothesized that mothers who return to work early do so because the economic benefits outweigh any negative repercussions of time and stress.

There is little existing research on early maternal employment in the United Kingdom or Australia. A handful of existing studies from the United Kingdom have identified a similar pattern to that of the older U.S. research, finding maternal employment soon after childbearing to be harmful for children's development. Joshi and Verropoulu (2000) examined two cohorts of children born in the 1970s and 1980s and found evidence of small negative associations between maternal employment in the child's 1st year and children's later reading scores. Ermisch and Francesconi (2000) assessed children born between 1970 and 1981 and found negative implications of more years of work before age 5 on children's school achievement, particularly when this work was full-time. Finally, Gregg, Washbrook, Propper, and Burgess (2005) analyzed data on 12,000 children born in 1991 and 1992 with results suggesting that full-time employment in the first 18 months after birth combined with informal child care led to poorer long-term cognitive outcomes for children, particularly for children of more advantaged parents. Note that these studies all used data from children born prior to the 1999 family leave policy expansions in the United Kingdom. Research on maternal employment in Australia is sparse with no known studies examining the relation between the timing of return to work and later child outcomes.

Some comparative research examining multiple countries exists. Crosby and Hawkes (2007) used comparative birth cohorts studies from the United States and United Kingdom (the same data set used in this study) to examine maternal employment patterns, finding American mothers engaged in paid work much sooner after childbirth than U.K. mothers. Greater financial and human capital predicted higher rates and earlier entries of employment after childbirth for mothers in both countries. A recent unpublished study examined the relation between the timing of mother's return to work in the 1st year and later child outcomes across five countries: the U.S., U.K., Australia, Canada, and Denmark. Huerta et al. (2011) found negative associations between early maternal employment and children's cognitive outcomes only among U.S. and U.K. children, and few associations with socioemotional outcomes in any of the countries. This study only examined maternal employment in the first 11 months, did not employ causal inference techniques nor address missing data, and did not examine the theoretical processes hypothesized to explain or differentially affect the associations.

The Present Study

The purpose of this study was to delineate the repercussions of early maternal employment for children's developmental competencies at school entry in recent nationally representative birth cohort samples of Australian and U.K. children. Using rigorous statistical methods to address selection bias, three sets of analyses assessed associations among (a) the timing of early maternal employment, (b) the mediating roles of time and money, and (c) the moderating roles of these factors

with children's cognitive and behavioral skills in first grade. Results provide important new information regarding the implications of early maternal employment and serve to extend past findings on American families.

Method

Sampling and Data Collection

Data for this study came from two data sets: (a) Australia's Longitudinal Study of Australian Children Birth Cohort (LSAC–B) and (b) the U.K.'s Millennium Cohort Study (MCS), each of which follows a representative sample of children from infancy through school entry. Children in each data set were an average age of 9 months at Wave 1, 34–39 months at Wave 2, and had nearly all entered first grade in primary school by Wave 4 (average age of 6.8 years in Australia and 7.4 years in the United Kingdom). Moreover, each sample is large and diverse, with children from families across the income distribution. In each survey the most knowledgeable caregiver, nearly always the biological mother of the focal child, was directly interviewed, providing information on the child, caregiver, and household. Children's development was assessed using reliable and well-validated instruments from both direct assessments and teacher reports, helping to reduce analytic concerns over shared method variance.

Australia

The LSAC–B is a study of a nationally representative cohort of approximately 5,100 children born in Australia between March 2003 and February 2004. Births were sampled from the Medicare enrollment database with stratification used to ensure proportional geographic representation for each state and territory. The survey sample excluded nonpermanent residents, also excluded children with the same name as deceased children, and only allowed for one child per household (for more information on LSAC–B, see Sanson, Nicholson, Ungerer, Zubrick, & Wilson, 2002). LSAC–B collected four waves of data with in-person interviews and direct assessments when children were on average 9 months (Wave 1), 3 years (Wave 2), 5 years (Wave 3), and 7 years (Wave 4) with response rates of 58%, 90%, 86%, and 84%, respectively. The analytic sample consisted of all children from the Wave 1 sample with survey weights and whose biological mother was the survey respondent at Wave 1 (99% of the sample), resulting in an analytic sample of 5,093 children.

United Kingdom

The MCS is a study of a nationally representative cohort of approximately 18,552 children born in the United Kingdom between September 2000 and August 2001. Births were sampled from Child Benefit records thereby excluding families ineligible for the Child Benefit, which for the most part were noncitizens (for further details about the MCS, see Shepherd, Smith, Joshi, & Dex, 2003). MCS collected four waves of data with in-person interviews and direct assessments when children were on average 9 months (Wave 1), 3 years (Wave 2), 5 years (Wave 3), and 7 years (Wave 4) with response rates of 68%, 84%, 82%, and 75%, respectively. The analytic sample consisted of all children from the Wave 1 sample with survey weights and whose biological mother was the survey respondent at Wave 1 (99% of the sample), resulting in an analytic sample of 18,497 children.

Within both analytic samples, there were missing observations due to attrition over the waves and missing data on individual measures. Missing data were imputed in Stata 12 (Royston, 2004) using multiple imputation by chained equations to create 10 complete data sets.

Measures

Measures were created in a parallel fashion for both data sets, except as noted earlier.

Maternal Employment

In each survey, mothers reported on their employment history and intensity at each wave. These data were used to create categorical measures of the timing of first employment after childbirth. Numerous timing cutoffs were considered (cutting at 6, 9, and 12 months; see Results, for details), culminating in a decision to delineate three mutually exclusive categories: first entry into employment before 9 months, first entry between 9 and 24 months, and no employment before 24 months, termed nonemployment. The delineation of 9 months was chosen to be comparable to recent U.S. research (e.g., Brooks-Gunn et al., 2002; Lombardi & Coley, 2014) to match the modal family leave policies and entry into employment, and to ensure adequate sample sizes in each category.

Process Variables

This study examined two constructs theorized to mediate or moderate the associations between early maternal employment and children's outcomes: time and money. Unless noted, these constructs were measured at the wave most directly coinciding with the first report of employment following childbirth (Wave 1 for mothers employed before 9 months and Wave 2 for mothers employed between 9 and 24 months) or at Wave 1 for mothers nonemployed for the first 2 years. A limitation of the data was that these measures were not always reported at the precise month of entry into employment. Time was assessed with two sets of measures. First, mothers' time in employment was categorized as part-time (< 30 hr) or full-time (≥ 30 hr), chosen to be comparative with prior research (e.g., Brooks-Gunn et al., 2010; Lombardi & Coley, 2014; see Results, for other categorizations). Second, a continuous measure of children's weekly hours in nonparental child care, measured in units of 10s, was used to assess parents' time away from children. Money was also measured in two ways. As an absolute measure, mothers reported their employment earnings, standardized in each data set to equalize the scale. A relative measure of economic benefits of work assessed mothers' employment earnings as a percentage of total household income. Exactly comparable measures of maternal employment income were not available; in the United Kingdom, mothers' employment earnings were a gross measure of income from employment, whereas in Australia, mothers' earnings represented a total of all maternal income (e.g., including benefits and income from investments).

Children's Cognitive Skills

In each country three measures of children's cognitive skills were assessed at age 7 using direct assessments or teacher reports. In Australia, children's academic skills were reported by teachers using the Language and Literacy and Mathematical Thinking subscales from the Academic Rating Scale (National Centre for Educational Statistics, 2002). The Language and Literacy Scale had nine items (e.g., conveys ideas when speaking, reads fluently; $\alpha = .96$) that rate a child's performance in oral and written language according to a 5-point scale (1 = *not yet*, 2 = *beginning*, 3 = *in progress*, 4 = *intermediate*, and 5 = *proficient*). The Mathematical Thinking Scale used the same scale to rate a child's performance on nine spatial and math items (e.g., creates and extends patterns, recognizes shape properties and relations; $\alpha = .94$). Due to the high correlation between the two scores ($r = .81$), the measures were averaged to create one composite assessing teacher-reported academic skills. The second measure of children's cognitive skills was matrix reasoning (MR), directly assessed with the MR test from the Wechsler Intelligence Scale for Children, 4th ed. This test of nonverbal intelligence (35 items) presents the child with an incomplete set of diagrams and requires them to select the picture that completes the set from five different options. Finally, children's receptive vocabulary skills were directly assessed using a shortened version of the Peabody Picture Vocabulary Test, 3rd ed. (Australian Council for Educational Research, 2000; Dunn & Dunn, 1997).

In the United Kingdom, children's spatial and reading skills were directly assessed using the British Ability Scales, a battery of tests of children's cognitive abilities and educational achievements (Hansen, 2012). The measure of spatial skills assessed children's spatial awareness by measuring the accuracy and speed at which each child constructed a design by putting together flat squares or solid cubes. Reading skills were assessed with children's English reading ability, requiring students to read aloud a series of words presented on a card. Children's math skills were assessed with an adaptation of the National Foundation for Educational Research Progress in Maths test which assessed children's knowledge of numbers, shapes, and measurement (Hansen, 2012).

Children's Behavioral Skills

In both surveys, children's behavior skills were reported by teachers using items from the Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997). The SDQ rates children's skills on a 3-point scale (0 = *not true*, 1 = *somewhat true*, and 2 = *certainly true*). Factor analyses derived three subscales: conduct problems ($\alpha = .76_{\text{Aus}}$; $.75_{\text{U.K.}}$), including five items covering children's temper tantrums, obedience, fighting, lying or cheating, and stealing behaviors; prosocial behaviors ($\alpha = .83_{\text{Aus}}$; $.84_{\text{U.K.}}$) with five items assessing children's considerate, sharing, helpful, kind, and volunteering behaviors; and attention skills ($\alpha = .88_{\text{Aus}}$; $.88_{\text{U.K.}}$) with five items assessing children's ability to sit still, fidgeting, distractibility, thinking before acting, and attention span. Higher scores indicate greater conduct

problems, greater prosocial behaviors, and greater attention skills.

To help control for the differences in measurement and child age at assessment, all raw outcome variables were age adjusted by taking the residuals from a regression of the outcome score on child age in months in each country which were then standardized to have a mean of 0 and a standard deviation of 1 so that coefficients represented a 1 *SD* shift, following prior comparative research (e.g., Coley, Lombardi, et al., 2013; Washbrook, Waldfogel, Bradbury, Corak, & Ghanghro, 2012).

Child Characteristics

Child characteristics included age at Wave 1, age at assessment (both in months), and gender. Child low-birth weight status was represented with an indicator of whether the child was born with low (< 2,500 g) birth weight. An indicator noted whether the focal child was from a multiple birth. Child race or ethnicity was categorized in the Australian data with two dummy variables indicating having a parent of Asian origin or an Aboriginal parent. Child race or ethnicity was captured in the U.K. data with dummy variables indicating White (reference), Black, Indian, Pakistani/Bangladeshi, multiracial, or other.

Children's behavioral and cognitive functioning also was measured at Wave 1. In the Australian data, child temperament was measured with a shortened version of the Australian revision of the Toddler Temperament Scale (Fullard, McDevitt, & Carey, 1984), assessing children's approach, persistence, and reactivity (four items in each domain measured on a 6-point scale; $\alpha = .98$), combined into a composite measure. The U.K. measure of temperament came from 14 questions from the Carey Infant Temperament Scale used to assess the child's regularity, approachability, and adaptability ($\alpha = .65$; Carey & McDevitt, 1995). To assess early cognitive ability, the Australian data used the Communication and Symbolic Behavior Scales Developmental Profile: Infant–Toddler Checklist (Wetherby & Prizant, 2001), a 24-item parent report scale ($\alpha = .89$) measuring children's early social, language, and cognitive skills. The U.K. survey used eight items from the Denver Developmental Screening Test, assessing communication skills and motor coordination, as well as five items from the MacArthur Communicative Development Inventories, identifying early communication gestures ($\alpha = .65$; Fenson et al., 1993; Frankenburg & Dodds, 1967).

Maternal and Household Characteristics

Maternal and household characteristics included Wave 1 measures of maternal age and maternal education, categorized as less than a secondary education, a secondary education (omitted), some higher education, and a bachelor's degree or higher. Additional aspects of maternal employment status included an indicator designating mothers that were employed during the year before the child was born and an indicator designating mothers' employment status at the wave of child assessments. Dichotomous variables indicated whether the primary language of the household was non-English at Wave 1 and whether either parent was an immigrant. Several time-varying characteristics were measured at each wave of data collection (Waves 1, 2, 3, and 4) and aggregated over time by averaging for continuous variables and categorizing for categorical variables. Gross household income, excluding mothers' employment earnings, was averaged over all of the waves and standardized to equalize the scale across the two countries. Income was not adjusted for family size, however, several family structure and composition covariates were incorporated: maternal marital status, measured with indicators of whether the mother was consistently married or married at some waves (vs. never married); an indicator of whether the mother was cohabitating at any wave; the number of nonpartner adults in the household; the number of siblings at Wave 1, an indicator for a new child born by Wave 2; and an indicator for a new child born between Waves 2 and 4. Two dichotomous variables indicated whether the mother received welfare some or all of the study waves (vs. at no waves). Finally, paternal employment was assessed with two dichotomous variables indicating a working partner in the household at some or all of the study waves (vs. no partner or no working partner at all waves).

Analytic Approach

The primary goal of the analyses was to assess how early maternal employment was associated with children's academic and behavioral skills in first grade. This question was assessed using a series of ordinary least squares (OLS) regression models to predict children's skills at first grade from the timing of mothers' entry into employment after childbirth. A primary concern was selection bias, that is, that maternal or family characteristics associated with selection into employment, rather than

maternal employment per se, may explain associations with children's academic and behavioral skills. To address this significant concern, three techniques were incorporated in the analyses. First, we incorporated propensity score weighting (PSW; Imbens, 2000; Rosenbaum & Rubin, 1983). PS techniques restructure correlational data to mimic randomized experimental data where a treatment group and control group are equated on observed, preexisting characteristics (Rosenbaum & Rubin, 1983). Adjusting for the propensity to be in the "treatment" group has been shown to remove a substantial portion of selection bias in nonexperimental research (see Leon & Hedeker, 2006), although it is important to note that PS techniques cannot control for unobserved factors, the influence of which may even be magnified by matching on observables (Pearl, 2009).

PSWs were created using the three-step procedure described by Imbens (2000). The first step involved estimating the propensity of mothers to be in each employment group, conducted using a multinomial logistic regression model as a function of observed pretreatment covariates, including Wave 1 measures of child gender, low-birth weight status, twin status, number of siblings, race or ethnicity, immigrant and non-English household indicators, and mother's age, education, and work status in the year prior to the child's birth, variables shown to be associated with selection into employment in prior research in the United States (e.g., Brooks-Gunn et al., 2002; Hill et al., 2005; Lombardi & Coley, 2014). The models were weighted with sampling weights for each study, which adjust for sampling procedures and nonresponse and properly adjust standard errors. PSWs were then created by taking the inverse of each child's conditional probability of receiving the early maternal employment treatment that the child actually received. T tests were used to assess significant differences on the covariates between the employment groups before and after the PSWs were applied (results shown in Table S1). Without PSWs, 48% of the t tests were significantly different ($p < .05$) in the Australian data, and 80% were significantly different in the U.K. data. Weighting by the PSWs dramatically reduced these percentages to 2% in Australia and 11% in the United Kingdom, suggesting that the PSWs adjusted for most, but not all, of the measured differences in families and children across the three employment groups.

Thus, as a second method of adjusting for selection bias, OLS regression models predicting children's cognitive and behavioral skills at first grade incorporated the exogenous, pretreatment covariates, as well as child age at assessment, marital status, and nonparental adults, to help remove remaining bias, with models weighted with the early maternal employment treatment-specific PSWs to generate the average treatment effect of maternal employment, shown in Equation 1.

$$\text{Child Outcomes}_{4/5i} = B_0 + B_1\,\text{Maternal Employment}_1 + B_2\,\text{Maternal}_{1-4/5i} + B_3\,\text{Child}_{1-4/5i} + \varepsilon_i \quad (1)$$

As a more conservative estimate, a second set of models were estimated adding additional covariates that may be more endogenous to mothers' employment decisions, including working partner, additional children, nonmaternal household income, welfare receipt, and maternal employment at Wave 4. These models also included Wave 1 measures of child cognitive ability (for models predicting cognitive skills) or temperament (for models predicting behavioral outcomes) to further reduce concerns of omitted variable bias (Cain, 1975).

After the main effects models assessing associations between the timing of maternal employment and children's school readiness skills, several additional models were estimated to address the role of maternal time and income. All further models were estimated with PSWs and included the full set of covariates and lagged child functioning variables, as has been done in similar research (e.g., Brooks-Gunn et al., 2002, 2010; Hill et al., 2005; Lombardi & Coley, 2014). To assess support for the theoretical suppositions that maternal time and money would serve as mediating processes linking early maternal employment to child functioning, OLS models were estimated predicting each of the hypothesized mediating processes, and then models predicting child outcomes were reestimated including the measures of time (children's weekly hours in nonparental care) and money (annual maternal earnings and maternal earnings percentage of total household income) as well as maternal employment patterns.

The third set of models assessed whether maternal time and money acted as moderators of early maternal employment. We first assessed the role of time by splitting each of the early employed groups into separate part-time and full-time groups. The resultant five categories of employment were analyzed using the three-step PSW technique described earlier. Next, we tested interactions between

maternal employment and centered, continuous measures of children's hours in nonparental child care. The role of money was tested with interactions with first, mothers' earnings, and second, earnings as a percent of total household income. Note that because these measures were continuous rather than categorical, PSW weights were not reassessed and thus these statistical models adjusted for selection into employment timing groups but not for selection into child-care hours or maternal earnings.

Results

Characteristics of Children and Mothers Associated With Early Employment Patterns

Table S2 presents descriptive statistics. Below we highlight the employment patterns in each country and the characteristics of mothers and children associated with these patterns.

Australia

Mothers entered the labor force slowly in Australia; almost 2/3 (62%) of mothers reported no employment in the 2 years following the focal child's birth, with 18% of mothers beginning employment prior to the child's 9th month, and 20% beginning employment between 9 and 24 months. Among mothers employed by 24 months, half were employed by 9 months (the mean month of return was also 9 months). Part-time employment was most common with approximately 3/4 of the mothers in both employment timing groups starting employment part-time (73% for mothers employed before 9 months, 79% for mothers employed between 9 and 24 months). Very early returns to employment that are common in the United States were rare in Australia, with only 8% of mothers returning to work by 3 months and 14% of mothers in the labor force at 6 months.

Numerous differences in mother and family characteristics emerged among nonemployed mothers, mothers employed before 9 months, and mothers employed between 9 and 24 months, generally suggesting that mothers that entered employment in the 2 years after childbirth were more advantaged with greater human and financial capital and healthier children, with few differences between mothers who entered employed before 9 months versus between 9 and 24 months. These patterns highlight the importance of selection factors in understanding early maternal employment. Considering the process variables, descriptive data show that children of employed mothers spent more hours in child care than children of nonemployed mothers, with the highest hours (18 hr per week) found among children of mothers employed between 9 and 24 months. Income from maternal employment was similar among children of mothers employed before 9 months or between 9 and 24 months, whereas mothers employed before 9 months contributed the most toward their total household income.

United Kingdom

U.K. mothers reported higher levels of early employment, with equal proportions of mothers entering entry into employment by 9 months (42%) as did those who reported no employment during the first 2 years (42%) with the remaining 16% entering employment between 9 and 24 months. Among mothers employed by 24 months, half returned to work by 5 months (average return month was 8 months), slightly earlier than in Australia. Similar to Australia, the majority of employed mothers started working part-time (64% of those employed before 9 months and 82% of those employment between 9 and 24 months), while a greater proportion of mothers who started work before 9 months worked full-time versus those who started work between 9 and 24 months. Although a very early return to employment was more common in the United Kingdom than in Australia, it was much less prevalent than in the United States. Twelve percent of U.K. mothers had entered the labor force by 3 months after childbirth, and 34% by 6 months.

As was seen in Australia, numerous differences in mother and family characteristics emerged between children of mothers who entered employment at different times or remained nonemployed during the first 24 months. The pattern in the United Kingdom was slightly different, generally suggesting that children of mothers who entered employment before 9 months had healthier children and were more advantaged than both nonemployed and later employed mothers. Descriptives of the process variables indicate that child-care hours were highest among mothers employed before 9 months in the United Kingdom versus between 9 and 24 months in Australia. The relative measure of maternal employment earnings was highest among the earliest employed mothers in Australia, whereas both maternal earnings and earnings as a proportion of total household income were highest

among mothers employed between 9 and 24 months in the United Kingdom.

Bivariate associations indicated that, across both countries, maternal employment was significantly associated with children's cognitive and behavioral skills when not adjusting for maternal and family characteristics. Findings suggest that children of mothers employed by 24 months (either before or after 9 months) had higher cognitive and behavioral skills in first grade in comparison to children whose mothers remained out of the labor market for the first 2 years, with few significant differences between mothers employed before 9 months and those employed between 9 and 24 months in either Australia or the United Kingdom.

Addressing Potential Selection Bias Using Covariates and PS

Tables 2 (Australia) and 3 (U.K.) present results from the multivariate PSW OLS regression models assessing child outcomes. The first set (Model 1), including a limited selection of time-invariant and pretreatment covariates, found that early maternal employment showed no significant associations with Australian children's cognitive or behavioral skills in first grade. In the United Kingdom, children of mothers who entered employed between 9 and 24 months had higher spatial, reading, and number skills and lower conduct problems than their peers whose mothers did not report any employment (Table 3). These differences were very small in size, ranging from 0.04 (spatial skills) to 0.06 (number skills and conduct problems) *SD* units.

The second model (Model 2) included a larger set of family characteristics as well as child functioning lags. The additional covariates did little to change the neutral pattern of results in Australia, but eliminated the significant pattern of associations in the United Kingdom (models with all of the covariates except the child functioning lag similarly found no associations in either country, results not shown). As such, these results suggest that the very small associations between maternal employment and child functioning in the United Kingdom may have been related to covarying family structure and resource characteristics.

Two additional sets of models were estimated in each country to test different specifications of the

Table 2
Australia: Influence of the Timing of Employment After Birth on the Development of Children's Cognitive and Behavioral Skills

	Cognitive skills			Behavioral skills		
Independent variables	Academic skills	Matrix reasoning	Vocabulary	Conduct	Prosocial	Attention
Model 1: Limited covariates						
Emp < 9 months	.02 (.05)	.08 (.06)	.02 (.05)	−.04 (.05)	−.04 (.06)	−.01 (.06)
Emp 9–24 months	.07 (.04)	.08 (.04)$^{+}$	.02 (.05)	−.09 (.05)	.05 (.05)	.07 (.05)
F of model	9.04**	5.69**	13.65**	4.62**	8.92**	11.73**
R^2	.10	.04	.13	.05	.09	.12
Model 2: All covariates and lag of outcome						
Emp < 9 months	.00 (.06)	.07 (.05)	.01 (.05)	−.04 (.06)	−.04 (.06)	−.01 (.06)
Emp 9–24 months	.06 (.05)	.07 (.05)	.01 (.05)	−.10 (.05)$^{+}$	.05 (.05)	.08 (.05)$^{+}$
F of model	6.97**	4.21**	10.57**	3.64**	6.38**	8.79**
R^2	.11	.05	.14	.06	.10	.13
Model 3: Testing child-care hours and annual maternal earnings as mediators						
Emp < 9 months	−.00 (.05)	.06 (.06)	.01 (.06)	−.07 (.06)	−.03 (.06)	.02 (.06)
Emp 9–24 months	.06 (.05)	.05 (.05)	.03 (.05)	−.16 (.06)**	.07 (.05)	.15 (.06)*
Child-care hours W1/2	−.01 (.03)	−.00 (.03)	−.03 (.02)	.06 (.03)*	−.02 (.03)	−.08 (.03)**
Annual maternal earnings W1/2	.05 (.03)	.04 (.04)	.03 (.04)	.02 (.04)	−.01 (.03)	.01 (.03)
F of model	6.63**	3.98**	10.26**	3.78**	6.07**	8.88**
R^2	.11	.05	.14	.06	.10	.13

Note. N = 5,093 Employed groups are compared to the omitted category of no employment. All models were estimated using OLS regression and weighted with propensity score weights. Model 1 controlled for the W1 value of child age, gender, low-birth weight status, twin status, number of siblings, and child age at assessment; the W1 value of mother age, education, Asian, indigenous, immigrant household, and English-speaking household; averages over W1–4 of the number of nonpartner adults living in the household, cohabitation, and marital status. Models 2 and 3 also controlled for a lag of the DV, an indicator for new sibling(s) W2, an indicator for new sibling(s) W3–4; averages over W1–4 of welfare recipient status, working partner, and household annual income excluding mother's earnings.
$^{+}p < .10$. *$p < .05$. **$p < .01$.

Table 3
United Kingdom: Influence of the Timing of Employment After Birth on the Development of Children's Cognitive and Behavioral Skills

	Cognitive skills			Behavioral skills		
Independent variables	Spatial	Reading	Number	Conduct	Prosocial	Attention
Model 1: Limited covariates						
Emp < 9 months	.04 (.03)	.02 (.03)	.03 (.03)	−.04 (.03)	.04 (.03)	.02 (.03)
Emp 9–24 months	.04 (.02)*	.05 (.02)*	.06 (.02)*	−.06 (.03)*	.05 (.03)$^{+}$	.01 (.02)
F of model	22.18**	41.13**	23.29**	12.52**	21.54**	26.44**
R^2	.08	.12	.08	.06	.10	.12
Model 2: All covariates and lag of outcome						
Emp < 9 months	−.00 (.03)	−.02 (.03)	−.00 (.03)	.01 (.03)	.01 (.03)	−.02 (.03)
Emp 9–24 months	.01 (.02)	.02 (.03)	.03 (.02)	−.03 (.03)	.03 (.03)	−.01 (.03)
F of model	19.05**	35.29**	21.06**	10.70**	16.58**	20.82**
R^2	.09	.14	.10	.07	.10	.13
Model 3: Testing child-care hours and annual maternal earnings as mediators						
Emp < 9 months	−.03 (.03)	−.03 (.03)	−.03 (.03)	−.01 (.04)	.03 (.03)	.00 (.03)
Emp 9–24 months	−.02 (.03)	.01 (.03)	−.00 (.03)	−.05 (.03)	.05 (.03)	.01 (.03)
Child-care hours W1/2	.02 (.01)	.01 (.01)	.02 (.01)$^{+}$	.02 (.01)$^{+}$	−.02 (.01)	−.02 (.01)
Annual maternal earnings W1/2	.02 (.01)	.00 (.01)	.02 (.01)$^{+}$	.00 (.01)	−.00 (.01)	−.00 (.01)
F of model	18.46**	33.30**	20.28**	10.35**	15.67**	19.83**
R^2	.09	.14	.10	.07	.10	.13

Note. N = 18,497 Employed groups are compared to the omitted category of no employment. All models were estimated using OLS regression and weighted with propensity score weights. Model 1 controlled for the W1 value of child age, gender, race/ethnicity, low-birth weight status, twin status, number of siblings, and child age at assessment; the W1 value of mother age, education, immigrant household, and English-speaking household; averages over W1–4 of the number of nonpartner adults living in the household, cohabitation, and marital status. Models 2 and 3 also controlled for a lag of the DV, an indicator for new sibling(s) W2, an indicator for new sibling(s) W3–4; averages over W1–4 of welfare recipient status, working partner, and household annual income excluding mother's earnings.
$^{+}p < .10$. $*p < .05$. $**p < .01$.

timing of entry into employment, including (a) entry before 6, 6–11, and 12–24 months, and (b) entry before 12 and 12–24 months; with all models incorporating PSWs and adjusting for the full set of covariates (Models 1 and 2, Tables S3 and S4). There were no significant results in the United Kingdom. Two significant differences emerged in the Australian models to suggest that children with mothers employed before 6 months had lower attention skills in comparison to children of mothers employed either between 6 and 11 months or 12 and 24 months. Overall, the results suggest no significant patterns of associations between the timing of employment and children's first-grade skills in either country across several different operationalizations of entry into employment.

Maternal Time and Money as Mediating Processes

The second set of models assessed time and money as potential mediating processes linking early maternal employment to child functioning. Although direct effect models suggested no significant associations between employment timing and child functioning, it is possible that counteracting mediational processes were canceling each other out. Results from models predicting the measures of time (children's weekly hours in nonparental care) and money (annual maternal earnings and maternal earnings as percentage of total household income), adjusting for all covariates (Table S5), suggested that starting employment before 9 months or between 9 and 24 months were predictive of greater child-care hours, maternal employment income, and percentage of total income in comparison to nonemployment in both Australia and the United Kingdom. There were significant differences between mothers employed before 9 months and between 9 and 24 months that varied between countries. Child-care hours were highest among mothers employed before 9 months in the United Kingdom and among mothers employed between 9 and 24 months in Australia. Maternal earnings were highest among mothers employed between 9 and 24 months in both countries, whereas percentage of total income was highest among mothers employed prior to 9 months in Australia and among U.K. mothers employed 9 to 24 months.

Models including measures of time and money to predict child functioning (Model 3, Tables 2 and 3) showed limited associations between child-care hours or maternal earnings and children's outcomes. In Australia, higher child-care hours at the time of first employment were associated with higher conduct problems and lower attention skills (0.06 and 0.09 *SDs* for each 10 hr of child care, respectively). In the United Kingdom, child-care hours and annual maternal earnings were not significantly associated with children's first-grade outcomes. Substituting maternal earnings as a percentage of total household income found similar results, with no significant associations with children's outcomes in either country (results not shown).

Sobel tests found evidence in Australia of significant indirect effects from employment prior to 9 months or between 9 and 24 months running through child-care hours to children's heightened conduct problems ($z = 2.10_{\text{emp }0\text{–}8}$, $p < .05$; $z = 2.15_{\text{emp }9\text{–}24}$, $p < .05$) and lower attention skills ($z = -2.72_{\text{emp }0\text{–}8}$, $p < .01$; $z = 2.84_{\text{emp }9\text{–}24}$, $p < .01$). But these indirect effects were counteracted by stronger direct effects of maternal employments' association with children's more positive behavioral skills in the models including the mediating processes. This was true for both conduct problems and attention skills with the size of the effect larger for employment begun between 9 and 24 months (effect sizes of 0.16 and 0.15 *SDs*, respectively) than earlier employment (0.07 and 0.02 *SDs*). There were not any significant indirect effects of child care in the United Kingdom nor was there any evidence of indirect effects through maternal earnings in the United Kingdom or Australia.

Maternal Time and Money as Moderators of Early Employment

The third set of models assessed whether maternal time and money acted as moderators rather than mediators of early maternal employment, altering the directionality or strength of associations with children's cognitive and behavioral skills (Tables 4 and 5). Overall, the results did not provide substantial evidence to suggest that greater time devoted to employment, time in child care, or absolute or relative income from mothers' earnings, altered the associations between early maternal employment and children's later functioning in Australia or the United Kingdom.

Very limited significant results emerged in relation to time in employment (Model 1). In Australia, children of mothers employed part time (< 30 hr per week) between 9 and 24 months showed lower conduct problems than their peers of nonemployed or full time 9 to 24 months employed mothers. In the United Kingdom, children of mothers entering employment part-time between 9 and 24 months had higher reported prosocial skills than children of full timers. To assess the robustness of results, models were reestimated defining part-time work as < 20 hr per week and full-time work as 20 hr or more per week. Results (Model 3, Tables S3 and S4) showed no significant differences. In addition, no significant interactions emerged between employment timing and child-care hours in Australia or the United Kingdom (Model 2, Tables 4 and 5).

In relation to money, few significant interactions emerged between maternal employment and maternal earnings (Models 3 and 4, Tables 4 and 5). There were no significant interactions in Australia for either the absolute or relative measures of maternal employment income. In the United Kingdom, maternal earnings were less positively linked with child cognitive skills for mothers first employed 9 to 24 months with employment begun during this time becoming less beneficial as maternal earnings increased. No evidence of differential links by relative maternal monetary contributions emerged in the United Kingdom.

Discussion

Returning to the labor force soon after childbirth is common among mothers in modern families, serving to sustain women's career trajectories, encourage more balanced gender roles within families, and increase families' economic resources (Gornick & Meyers, 2003; Waldfogel, 1998). Recognizing this, all industrialized countries except the United States have implemented parental leave policies to provide income replacement and job protections for mothers for a period of time following childbirth (Kamerman, 2000; Ruhm, 2011). Despite the uniqueness of the U.S., the existing literature on the implications of mothers' labor force participation for children's development has primarily focused on American children. Findings from prior cohorts of American and U.K. children have produced conflicting findings, with some studies suggesting that maternal employment begun early in infancy appears to pose a small but statistically significant threat to children's development (Baydar & Brooks-Gunn, 1991; Berger et al., 2005; Brooks-Gunn et al., 2002, 2010; Ermisch & Francesconi, 2000; Gregg et al., 2005; Han et al., 2001; Hill et al., 2005; Joshi

Table 4
Australia: Influence of the Timing of Employment After Birth on the Development of Children's Cognitive and Behavioral Skills

	Cognitive skills			Behavioral skills		
Independent variables	Academic skills	Matrix reasoning	Vocabulary	Conduct	Prosocial	Attention
Model 1						
Emp < 9 months part-time	−.03 (.07)	.08 (.07)	.03 (.06)	−.06 (.06)	−.07 (.07)	−.03 (.07)
Emp < 9 months full-time	−.06 (.10)	.10 (.09)	−.08 (.09)	.07 (.12)	−.01 (.12)	−.06 (.13)
Emp 9–24 months part-time	.06 (.05)	.06 (.05)	.01 (.06)	−.13 (.06)*[a]	.05 (.06)	.08 (.06)
Emp 9–2 months full-time	−.07 (.09)	.07 (.09)	−.02 (.08)	.09 (.11)[a]	−.06 (.10)	−.05 (.08)
F of model	4.70**	2.71**	6.83**	2.42**	4.02**	5.88**
R^2	.11	.05	.14	.06	.10	.14
Model 2						
Emp < 9 months	.02 (.06)	.07 (.06)	.02 (.06)	−.07 (.06)	−.03 (.06)	.03 (.06)
Emp 9–24 months	.07 (.05)	.05 (.06)	.04 (.05)	−.16 (.06)**	.09 (.05)$^+$	.17 (.06)**
Child-care hours W1/2	−.07 (.03)*	.01 (.03)	−.04 (.03)	.07 (.04)$^+$	−.04 (.03)	−.13 (.04)**
Emp < 9 Months × Child-Care Hours W1/2	.09 (.05)	−.01 (.05)	.02 (.05)	−.01 (.05)	.05 (.05)	.09 (.05)$^+$
Emp 9−24 Months × Child-Care Hours W1/2	.08 (.05)$^+$	.01 (.05)	.02 (.05)	−.01 (.05)	−.01 (.05)	.05 (.05)
F of model	6.38**	3.85**	9.83**	3.68**	5.92**	8.81**
R^2	.11	.05	.14	.06	.10	.14
Model 3						
Emp < 9 months	.00 (.06)	.06 (.06)	.01 (.05)	−.06 (.06)	−.04 (.06)	.00 (.06)
Emp 9–24 months	.06 (.05)	.06 (.05)	.03 (.05)	−.12 (.06)*	.06 (.05)	.09 (.05)$^+$
Annual maternal earnings W1/2	−.02 (.05)	.03 (.05)	−.04 (.05)	.06 (.05)	−.00 (.06)	−.05 (.05)
Emp < 9 Months × Annual Maternal Earnings	.09 (.07)	.03 (.07)	.10 (.07)	−.03 (.07)	−.01 (.07)	.02 (.07)
Emp 9–24 Months × Annual Maternal Earnings	.05 (.07)	−.00 (.09)	.02 (.07)	−.02 (.08)	−.04 (.07)	.03 (.07)
F of model	6.53**	3.87**	9.73**	3.41**	5.88**	8.08**
R^2	.11	.05	.14	.06	.10	.13
Model 4						
Emp < 9 months	−.09 (.08)	.04 (.10)	−.03 (.10)	.03 (.10)	−.07 (.11)	−.12 (.09)
Emp 9–24 months	.00 (.08)	−.01 (.08)	−.08 (.08)	−.00 (.09)	.03 (.09)	−.01 (.07)
Maternal earnings % of total household W1/2	−.16 (.10)	−.12 (.10)	−.15 (.11)	.38 (.14)*	−.23 (.11)*	−.38 (.14)**
Emp < 9 Months × Maternal Earnings %	.31 (.27)	.13 (.24)	.14 (.27)	−.30 (.25)	.13 (.28)	.42 (.27)
Emp 9–24 Months × Maternal Earnings %	.21 (.23)	.27 (.24)	.33 (.22)	−.39 (.23)$^+$	.11 (.25)	.34 (.21)
F of model	6.55**	3.84**	9.05**	3.25**	5.39**	7.68**
R^2	.11	.05	.14	.06	.10	.13

Note. N = 5,093 Employed groups are compared to the omitted category of no employment. Within each column, groups shared superscript letters are different from each other at the $p < .05$ level. All models were estimated using OLS regression and weighted with propensity score weights. All analyses controlled for the W1 value of child age, gender, low-birth weight status, twin status, number of siblings, and a lag of the DV; an indicator for new siblings W2, an indicator for new siblings W3–4, and child age at assessment; W1 value of mother age, education, Asian, indigenous, immigrant household and English-speaking household; averages over W1–4 of the average number of nonpartner adults living in the household, cohabitation, marital status, welfare recipient status, working partner, and household annual income excluding mother's earnings.
$^+p < .10$. $*p < .05$. $**p < .01$.

& Verropoulu, 2000), although at least one more recent study has found few links between early maternal employment and children's development (Lombardi & Coley, 2014). The goal of the current study was to extend this research to other countries with diverse policy contexts. Australia and the United Kingdom were chosen due to the general similarities of social contexts with differing policies

Table 5
United Kingdom: Influence of the Timing of Employment After Birth on the Development of Children's Cognitive and Behavioral Skills

	Cognitive skills			Behavioral skills		
Independent variables	Spatial	Reading	Number	Conduct	Prosocial	Attention
Model 1						
Emp < 9 months part-time	.01 (.03)	.05 (.05)	.01 (.03)	.00 (.04)	−.01 (.04)	.02 (.03)
Emp < 9 months full-time	−.06 (.08)	−.03 (.07)	−.04 (.06)	.02 (.07)	−.03 (.06)	−.05 (.07)
Emp 9–24 months part-time	.02 (.03)	.06 (.03)$^{+}$	.03 (.03)	−.04 (.03)	.04 (.03)^{a}	.03 (.03)
Emp 9–24 months full-time	−.03 (.03)	.03 (.04)	.01 (.04)	.03 (.04)	−.05 (.04)^{a}	−.04 (.04)
F of model	9.46**	15.85**	10.15**	5.45**	9.57**	11.14**
R^2	.09	.14	.10	.07	.10	.13
Model 2						
Emp < 9 months	.00 (.04)	−.01 (.04)	−.01 (.04)	−.02 (.04)	.02 (.03)	−.00 (.04)
Emp 9–24 months	.03 (.03)	.03 (.03)	.04 (.03)	−.05 (.03)	.04 (.04)	.00 (.03)
Child-care hours W1/2	−.02 (.03)	−.01 (.02)	−.01 (.03)	.03 (.03)	−.01 (.02)	−.02 (.02)
Emp < 9 Months × Child-Care Hours W1/2	.02 (.04)	.00 (.03)	.03 (.04)	−.01 (.04)	−.01 (.03)	.01 (.03)
Emp 9–24 Months × Child-Care Hours W1/2	.06 (.03)$^{+}$	.04 (.03)	.04 (.03)	−.01 (.03)	−.01 (.03)	−.00 (.03)
F of model	17.99**	32.74**	19.52**	10.15**	15.61**	19.49**
R^2	.09	.14	.10	.07	.10	.13
Model 3						
Emp < 9 months	−.02 (.03)	−.04(.03)	−.02(.03)	.01 (.04)	.01 (.03)	−.03 (.03)
Emp 9–24 months	−.01 (.03)	.01 (.03)	.00 (.03)	−.03 (.03)	.04 (.03)	−.01 (.03)
Annual maternal earnings W1/2	.07 (.03)*	.07 (.02)**	.07 (.02)**	−.00 (.03)	.00 (.02)	.02 (.02)
Emp < 9 Months × Annual Maternal Earnings	−.03 (.04)	−.04 (.04)	−.03 (.03)	.01 (.05)	−.01 (.05)	−.03 (.05)
Emp 9–24 Months × Annual Maternal Earnings	−.06 (.03)*	−.08 (.03)**	−.06 (.03)*	.01 (.03)	−.01 (.03)	−.02 (.03)
F of model	18.30**	33.57**	20.81**	9.86**	15.36**	19.11**
R^2	.09	.14	.10	.07	.10	.13
Model 4						
Emp < 9 months	−.02 (.06)	−.03 (.06)	.00 (.07)	.01 (.06)	.01 (.06)	−.00 (.06)
Emp 9–24 months	.02 (.04)	.07 (.04)	.03 (.04)	−.04 (.04)	.04 (.04)	.01 (.04)
Maternal earnings % of total household W1/2	.07 (.07)	.07 (.06)	.01 (.06)	−.02 (.06)	.01 (.05)	.03 (.06)
Emp < 9 Months × Maternal Earnings %	.04 (.21)	.01 (.20)	−.02 (.23)	.02 (.21)	−.02 (.19)	−.07 (.19)
Emp 9–24 Months × Maternal Earnings %	−.05 (.09)	−.16 (.08)	.01 (.08)	.04 (.09)	−.03 (.09)	−.06 (.08)
F of model	17.92**	31.90**	19.25**	9.79**	15.40**	19.12**
R^2	.09	.14	.10	.07	.10	.13

Note. N = 18,497 Employed groups are compared to the omitted category of no employment. Within each column, groups shared superscript letters are different from each other at the $p < .05$ level. All models were estimated using OLS regression and weighted with propensity score weights. All analyses controlled for the W1 value of child age, gender, race/ethnicity, low-birth weight status, twin status, number of siblings, and a lag of the DV; an indicator for new siblings W2, an indicator for new siblings W3–4, and child age at assessment; the W1 value of mother age, education, immigrant household, and English-speaking household; averages over W1–4 of the average number of nonpartner adults living in the household, cohabitation, marital status, welfare recipient status, working partner, and household annual income excluding mother's earnings.
$^{+}p < .10$. *$p < .05$. **$p < .01$.

surrounding early maternal employment and alternate care, as well as the availability of nationally representative longitudinal surveys.

We hypothesized that the implications of early maternal employment would have both similarities and differences across countries. Based upon the diverse policy contexts, we expected the counteracting mediational processes might differ somewhat in the United Kingdom and Australia versus the United States due to options and incentives for mothers

to remain out of the labor force through paid and unpaid maternity leave and to cultural norms promoting longer leaves. Given these differences, we thought that mothers who returned to work early may have done so because the economic benefits outweighed any negative repercussions of time, leading to more positive repercussions of early maternal employment for children's development. In contrast, based on theoretical models of child development posited to operate universally across diverse families, an alternate hypothesis was that the implications of early maternal employment might be similar across countries. The results provide more support for this later hypothesis.

First, descriptive data from both countries revealed that Australian and U.K. mothers returned to work later and at lower intensity in comparison to what is normative in the United States. This was particularly true for Australian mothers: Less than half were working 2 years after childbirth and, among those that did return to work, nearly three-fourth were working part-time. Although the descriptive differences in early maternal employment patterns were striking, there were similarities in the associations of these patterns with children's outcomes. We found few direct associations between maternal employment begun in the first 2 years after childbirth and children's cognitive or behavioral skills after entry into first grade in Australia or the United Kingdom. There were some very small positive associations between employment begun between 9 and 24 months and children's later cognitive and behavioral skills in the United Kingdom when only adjusting for covariates truly exogenous to employment. However, in more conservative models incorporating family structure and alternate economic resource covariates, no significant associations remained between early maternal employment and children's functioning. Overall, the neutral or slightly positive associations suggest that early employment poses no risks for children's cognitive skills development. These results coincide with the most recent national estimates of early maternal employment effects in the United States (Lombardi & Coley, 2014) to suggest that the negative associations of early maternal employment found for prior cohorts of U.S. and U.K. children may have changed as maternal employment has become more normative, child care more readily available, and fathers more engaged in childrearing (Gauthier, Smeeding, & Furstenberg, 2004; Hoffman & Youngblade, 1999; Kamerman, 2000; Smith et al., 2010).

Second, we found limited evidence of mediating or moderating processes related to maternal time or money in Australia or the United Kingdom. That is, there were few consistent patterns to suggest that these processes explained or altered associations between early maternal employment and children's school readiness skills, with only a handful of significant associations across the statistical models. For example, there was a slight indication that more time away from parenting was negatively linked to children's behavioral functioning. Full-time maternal employment begun between the child's 9th and 24th months showed small links with higher conduct problems for Australian children, and lower prosocial skills for children from the U.K., whereas part-time work during this time was associated with enhanced behavioral functioning. These results are similar to older research from the U.S. finding negative associations with early full-time work (Brooks-Gunn et al., 2002) but contrast with more recent U.S. research finding small negative associations between early part-time work and children's functioning (Lombardi & Coley, 2014). One explanation for why part-time employment may less beneficial in the United States than in Australia and the United Kingdom is the differing policy context between the countries. Part-time jobs in the United States tend to be lower paying and offer few benefits such as health insurance and paid sick days. In contrast, part-time jobs in Australia and the United Kingdom tend to offer prorated pay and benefits, government policies mandate paid days off for all employees, and health insurance is universal rather than employer provided (Ray, Sanes, & Schmitt, 2013).

Another indication that time away from parenting may be important derived from models assessing the mediational role of children's hours in nonparental care. That is, in Australia, we found very small indirect effects running from early maternal employment to greater hours in nonparental care to worse behavioral skills among children. These findings on the effects of child care replicate research on Australian (Coley, Lombardi, & Sims, 2014) and American children (e.g., Coley, Lombardi, et al., 2013; Coley, Votruba-Drzal, Miller, & Koury, 2013; Magnuson, Ruhm, & Waldfogel, 2007; NICHD Early Child Care Research Network, 2003; Phillips, McCartney, & Sussman, 2006), which found that attending early education and care programs, particularly full-time center-based programs begun early in life, are predictive of lower behavioral functioning later in childhood. However, the small effect found for Australian children in this

study was counteracted by a positive direct connection suggesting that a different mechanism (other than maternal earnings) was counteracting the role of hours in child care. For example, employed mothers may gain self-esteem, intellectual stimulation, or social connections through work that in turn help to support positive child development.

A second set of results emerged suggesting the potential importance of maternal earnings in understanding effects of early maternal employment, although these results were limited to the U.K. and to employment begun later in the child's infancy. These results suggested that maternal earnings were less related to children's cognitive functioning when mothers entered employment between 9 and 24 months. That is, children with lower earning mothers appeared to benefit from employment begun during this time period in comparison to children with lower earning mothers who began employment earlier or were not employed during the first 2 years. These results align with research on samples of U.S. children that has found some positive associations of early maternal employment for children's development in low-income families (Berger et al., 2008; Coley & Lombardi, 2013).

In summary, this study found few significant links between mothers' return to work after childbirth and children's later cognitive and behavioral skills in recent cohorts of Australian and U.K. children. Although one set of results suggested that time away from parenting may drive small negative links between early employment and children's behavioral functioning and that maternal earnings may be less associated with cognitive skills for children of mothers who started employment between 9 and 24 months, results overall suggested that there are limited repercussions of early maternal employment. Despite policy and cultural differences across countries impacting mothers' incentives, options, and norms about returning to work, the overall neutral associations between maternal employment and children's development appeared generally robust both across countries and between subgroups within countries.

Limitations and Conclusions

In interpreting the significance and implications of the results from this study, it is essential to acknowledge study limitations. The employment variables only measured mothers' first job following childbirth and did not address full employment histories and the consistency of mothers' employment over the course of the study. We also lacked data on employment satisfaction or quality. Second, although the variables in this study were fairly objective (e.g., demographic characteristics and the timing of employment after birth) and both of the surveys used well-validated direct assessments and teacher reports of children's skills, there may still be issues of equivalency and measurement bias across the data sets due to cultural norms and expectations. Finally, although the statistical models used quasi-experimental methods to control for a range of measured characteristic of children, mothers, and families that might predispose women into employment patterns and affect child functioning, the data remain correlational and do not show causal effects, and hence results need to be interpreted with caution.

In the context of these cautions, findings from the present study suggest that early movements into employment following childbirth may not be associated with developmental risks or benefits for most modern children in Australia and the United Kingdom. These results were replicated across multiple statistical models in contemporary birth cohort studies in these two countries. Shifting social norms, family behaviors, and economic forces may have reduced the negative effects of increased time devoted to employment and increased the positive effects of income from maternal employment for children's development.

These findings are good news—maternal employment is a norm worldwide and an important contributor to both families' and countries' economies. As seen in the descriptive findings from this study, the majority of mothers in the United Kingdom (nearly 60%) returned to work within the first 2 years after childbirth, whereas a smaller percentage, more than one third, of Australian mothers were working by the time their child was 2 years old. Families and societies benefit from mothers' work: It supports women's careers, encourages balanced gender roles, and increases families' economic resources (Gornick & Meyers, 2003; Waldfogel, 2010). Our findings suggested that children from Australia and the United Kingdom are not harmed by this employment.

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Supporting Information

Additional supporting information may be found in the online version of this article at the publisher's website:

Table S1. Mean Statistics of Preemployment Covariates Before and After Adjusting for Propensity Score Weighting (PSW) in Australian and U.K. Samples