



Early Maternal Employment And Children’s School Readiness: Changing Associations Over Time?

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Abstract

This study assessed whether the links between early maternal employment and children’s school readiness have changed over time. Research has examined mothers’ labor force participation and its associations with children’s well-being. As maternal employment has become more normative, these associations may have changed, particularly among subgroups of families. Data come from two large, longitudinal samples of children born in the U.S. in 1991 ($N = 1042$) and in 2001 ($N = 7850$). OLS regression models estimated changes between cohorts in the associations between early maternal employment and children’s reading/language skills, math skills, and conduct problems at age 4 and school entry. Despite similar prevalence rates of maternal employment by 9 months between the 1991 and 2001 samples, there were differences in the demographic characteristics of mothers in each employment pattern over the decade. Examining associations between the early maternal employment patterns and children’s school readiness, results revealed that full time employment by 9 months in comparison to non-employment shifted to having more positive associations with reading/language skills at age 4 and school entry from 1991 to 2001. However, full time maternal employment by 9 months was associated with children’s higher conduct problems at school entry in 1991 and 2001, and by 2001, part time employment had similar repercussions. The results differed by family income. There have been small changes in the associations between early maternal employment and children’s school readiness over time.

Keywords Maternal employment · School readiness · Reading/language skills · Mathematical skills · Conduct problems

Highlights

- Full time employment by 9 months shifted to having more positive links with reading/language skills from 1991 to 2001.
- Full time maternal employment by 9 months was associated with children’s higher conduct problems in 1991 and 2001.
- Changes in the associations between maternal employment and school readiness differed by family income.

The increase in maternal employment over the end of the last century spurred a substantial body of research on mothers’ labor force participation and its associations with children’s well-being. A particular focus has been on women with infants whose employment rates rapidly increased from 34% in 1975 to over 60% in recent estimates (U.S. Department of Labor, 2018). Whereas other countries

scaled up their parental leave policies in response to these demographic shifts, providing income and job protections, U.S. policy expansions, thus far, have been significantly more limited with no federal paid parental leave and a limited federal unpaid parental leave policy (Isaacs et al. 2017; Ruhm 2011; Teti et al. 2017; Waldfogel et al. 2019). Lacking paid leave and job protection, many new mothers in the U.S. either exit the labor force or return to work soon after childbirth (Isaacs et al. 2017). The COVID-19 pandemic has further highlighted the uncertain nature of maternal labor force participation (Landivar et al. 2020).

Much of the research on early maternal employment has utilized a handful of large, longitudinal survey studies of U.S. families with children born in the 1980’s, 1990’s, and early 2000’s due to data availability. Initially, this research

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documented small negative links between maternal employment begun in a child's first year and children's later outcomes among the full samples of children (Brooks-Gunn et al. 2002 2010; Han et al. 2001; Hill et al. 2005). For example, in a sample of children born in 1991, Brooks-Gunn et al. (2002; 2010) found that maternal employment begun before the child's 9th month was linked to lower child cognitive and behavioral skills at ages 3 and 4 years and extending to ages 7 and 8 years. Conversely, in a more recent nationally representative birth cohort of children born in 2001, few links were found between maternal work before 9 months and children's kindergarten skills (Lombardi and Coley 2014). These neutral findings of maternal work before 9 months and children's school entry skills were replicated in two nationally representative birth cohorts of children born in the early 2000's in the U.K. and Australia (Lombardi and Coley 2017).

Leveraging two of these surveys that followed U.S. children from infancy through entry into kindergarten, the purpose of this study was to ask whether the associations between mothers' early returns to the labor market and children's school readiness have changed over time. The two large, longitudinal surveys utilized in this study assessed children born one decade apart, in 1991 and 2001. They each include comparable information on early maternal employment and children's school readiness, allowing for the examination of whether the initial negative associations between early maternal employment and child outcomes have diminished. Given that existing findings suggest that associations may vary by family economics (Berger et al. 2008; Coley and Lombardi 2013; Lombardi and Coley 2014; Perry-Jenkins and Gerstel 2020), patterns of association were also examined by family income. Understanding how the associations between early maternal employment and children's development have changed over time is important to family science, informing our understanding of contextual influences on children's development as well as parental leave, work flexibility, and child care policies. Prior literature has explored similar questions in various samples, however has not examined variations between them (Greenfield 2017). The current study synthesizes these questions into a single study with the purpose of using the same methodology to examine whether the patterns of association have changed over time.

Changing Associations Over Time: Theoretical and Methodological Perspectives

Social science theories suggest a variety of hypotheses regarding how maternal employment relates to child development. These perspectives suggest that maternal

employment provides benefits to mothers, children, and families, yet also may pose challenges (Heinrich 2014). Maternal employment brings economic resources to mothers (Becker and Tomes 1986), and may also provide cognitive, social, and psychological benefits (Bianchi 2000; Hoffman 1989; Raver 2003). These resources and benefits may promote children's development directly and indirectly through financial investments, social capital, and maternal well-being (Becker and Tomes 1986; Bianchi 2000; Heinrich 2014; Hoffman 1989; Lombardi 2021; Parcel and Menaghan 1997; Raver 2003). Conversely, employment may limit time and energy for parenting (Becker and Tomes 1986; Bianchi 2000; Hoffman 1989), create work-to-family conflict (Hoffman 1989; Holmes et al. 2018; Borelli et al. 2017), or hamper child attachment (Chase-Lansdale and Owen 1987; Hoffman 1989). Taken together, these theoretical perspectives argue for counteracting mediational processes, in which maternal employment provides potential benefits, yet also poses challenges for families.

Maternal employment and these resulting processes may have different implications for children born more recently than it did previously due to numerous shifts within the economy, policy, family life, and culture (Perry-Jenkins and Gerstel 2020; Seltzer 2019). Changes in child care and employment policy in the 1990's included funding for Early Head Start, expansion of the Earned Income Tax Credit (EITC), and major revisions to the welfare program that dramatically increased funding for child care subsidies, while notably limiting cash assistance and increasing work requirements (Haskins 2006; Heinrich 2014). Simultaneously, there were public and private efforts to increase the quality of child care (Kamerman and Gatenio-Gabel 2007), including a revision of the National Association for the Education of Young Children (NAEYC)'s *Developmentally Appropriate Practice in Early Childhood Programs* (Bredenkamp and Copple 1997). Over the decade, there was substantial growth in center-based child care settings (Kamerman and Gatenio-Gabel 2007), child care enrollment rose, particularly among children from low-income families (Magnuson and Waldfogel 2016), and greater numbers of mothers with young children entered the labor force, especially those with low family incomes (Heinrich 2014). Despite higher maternal employment rates, there is evidence that mothers' time with their children remained consistent (Bianchi 2000), with greater engagement among fathers in child rearing (Bianchi 2000; Sayer et al. 2004) and an increase in multigenerational households (Pilkaukas et al. 2020). Simultaneously, there was changing cultural attitudes about women's roles at work and home with evidence of greater acceptance of working mothers over the 1990s (Donnelly et al. 2016). Given these notable changes, some of the previously negative implications of early maternal employment for children may have dissipated over time

whereas the benefits may have risen. However, the implications of these changes are likely to vary across families due to the differential impacts of these shifts on mothers, children, and families (Heinrich 2014; Perry-Jenkins and Gerstel 2020).

Research using two large studies of children born in the U.S. in the 1980's and early 1990's found negative links between full time maternal employment begun in the first 9 or 12 months and children's cognitive and socio-emotional well-being at ages 3 and 4 years (Brooks-Gunn et al. 2002; Hill et al. 2005) and extending to ages 7 and 8 years (Brooks-Gunn et al. 2010; Han et al. 2001; Hill et al. 2005). Similar slight negative associations between early maternal employment in the first year and children's later cognitive and behavioral development have been found among children born in the 1970's, 1980's, and 1990's in the U.K. (Ermisch and Francesconi 2000; Gregg et al. 2005; Joshi and Verropoulou 2000). However, research on a sample of children born in the U.S. in 2001 found few links between maternal work by 9 months and children's cognitive and behavioral skills in kindergarten (Lombardi and Coley 2014). Parallel neutral links between maternal employment by 9 months and children's cognitive and behavioral skills at school entry were found among children born in the early 2000's in Australia and the U.K. (Lombardi and Coley 2017). Although descriptive comparisons between studies suggest that the influences of maternal employment on children's development may have changed as maternal work has become more normative, it is also possible that variations in the results are due to differences in methodology or changing demographics of employed and non-employed mothers (Cotter et al. 2013; Duncan et al. 2004).

Providing support for the hypothesis about changing selection effects, research examining differences by family income suggest some benefits of early maternal employment begun by 9 or 12 months after childbirth for the development of children from low-income families (Berger et al. 2008; Coley and Lombardi 2013; Lombardi and Coley 2014). Given that there were increased numbers of low-income mothers in the labor market following the changes to the welfare program, child subsidies, and the EITC in the time period around 1996 (Cotter et al. 2013; Haskins 2006; Heinrich 2014), it is possible that these increases might explain the shift from negative to neutral associations with children's development. At the same time, researchers have utilized different approaches to addressing selection bias in observational data and the measurement and inclusion of specific variables. Therefore, it is difficult to disentangle changes in the relations between early maternal employment and children's outcomes from differences in research methodology and changing selection effects over time. It is also important to consider heterogeneity in changing

associations by family income, as well as other factors (Perry-Jenkins and Gerstel 2020).

The Present Study

The purpose of this study was to determine if the links between early maternal employment and children's well-being changed over time in the U.S. using two large-scale, longitudinal datasets of children born in 1991 and 2001. There were three primary research goals: (1) to assess how the characteristics of children and families correlated with maternal employment patterns following childbirth have changed over time, (2) to examine how the links between early maternal employment patterns and children's school readiness have changed over time, and (3) given that the associations between early maternal employment and children's development may not be uniform across families (Perry-Jenkins and Gerstel 2020), to determine how the patterns of change over time differ across family income groups.

To answer these questions, data was drawn from the NICHD Study of Early Child Care and Youth Development (SECCYD) and the Early Childhood Longitudinal Study-Birth Cohort (ECLS-B). The SECCYD is a large ($N = 1364$) longitudinal study of children born in the U.S. in 1991 (<https://www.nichd.nih.gov/research/supported/seccyd>). The sample was not nationally representative and prior research has found it to have, on average, slightly higher levels of income and education and lower proportions of racial and ethnic minorities (NICHD ECCRN, 1997). However, in general, it has been found to closely match the demographic characteristics of those living in the same geographic areas at the beginning of the study (NICHD ECCRN, 1997). The ECLS-B is a large ($N \sim 10,500$) longitudinal birth cohort study, representative of children born in the U.S. in 2001 (<https://nces.ed.gov/ecls/birth.asp>).

Although these questions have been asked within separate samples of U.S. children, these analyses used two cohorts of children born 10 years apart and identical research methodology. A strength is the ability to examine the links between early maternal employment and children's school readiness at two ages within two samples that span children's entry into kindergarten (4 years and in kindergarten or first grade), capturing children's development over a critical time point. In addition, this study provides evidence on the extent to which employment patterns and associations with children's development have changed over time within low-, middle-, and high-income families, which have been shown to have varying patterns of maternal work and links with children's development (Berger et al. 2008; Coley and Lombardi 2013; Lombardi and Coley 2014; Perry-Jenkins and Gerstel 2020).

Based upon existing research and policy changes that occurred in the 1990's (Cotter et al. 2013; Haskins 2006; Heinrich 2014), it was expected that more mothers with low family incomes would have entered the workforce soon after childbirth, and at a higher intensity, in 2001 in comparison to 1991. Based upon these expected higher rates of early employment by mothers with low family incomes combined with prior research finding more positive associations between early employment and children's development among low-income mothers (Berger et al. 2008; Coley and Lombardi 2013; Lombardi and Coley 2014), it was hypothesized that there would be small positive changes in the association between early maternal employment and children's school readiness between 1991 and 2001.

Methods

This study leveraged secondary data from two large-scale, longitudinal studies of children born in the U.S. Born in 1991, children in the NICHD Study of Early Child Care and Youth Development (SECCYD) were assessed at 6, 15, 24, and 36 months as well as at 4½ years and in first grade (M age = 7.01 years, SD = 0.29). Born 10 years later in 2001, children in the Early Childhood Longitudinal Study-Birth Cohort (ECLS-B) were assessed at 9 months, 2 years, 4 years, and after kindergarten entry (M age = 6.26 years, SD = 0.77).

The SECCYD and the ECLS-B were chosen due to similarities in the measurement of maternal employment and children's development. In each study, the most knowledgeable caregiver, nearly always the biological mother, was interviewed. Children's development was assessed using reliable and well-validated instruments. No other known surveys provide comparable measures of mothers' early employment and children's development at school entry in the U.S. Although each study has limitations, these datasets represent the two largest, most comprehensive longitudinal samples of U.S. children born in a single year and followed from infancy through school entry, providing a unique opportunity to examine the experiences of children over time. Ethical approval was obtained from the University of Connecticut Institutional Review Board (protocol: H17-104; project name: Early maternal employment and children's school readiness: Changing associations over time).

Children Born in 1991

The SECCYD is a prospective longitudinal study that was originally designed to examine early child care. Shortly after giving birth in 1991, 1364 women and their recently born children living in or near 10 urban and suburban sites in the United States were recruited to participate in the SECCYD using a conditional random sampling method.

Families were excluded from the study if children had a disability or mothers were younger than 18 years old, were not fluent in English, or lived in a very dangerous neighborhood. Although the sample is economically and geographically diverse, these exclusion criteria limited the number of children from the most disadvantaged families and from non-White families (NICHD ECCRN, 1997).

Children Born in 2001

The ECLS-B is a longitudinal study of a nationally representative cohort of 10,700 children born in the U.S. in 2001 (Flanagan and West 2004). Births were sampled from 96 core primary sampling units (PSU), which were geographic regions consisting of counties or groups of counties. Children who died or were adopted prior to 9 months, and children born to mothers younger than age 15, were excluded. Data were collected in a multitude of languages.

Both analytic samples consisted of children who had valid assessment data. Within these analytic samples, there were still missing data on individual measures. To avoid bias from listwise deletion, missing data were imputed in Stata 16 using multiple imputation by chained equations to create 20 complete datasets for each sample (Little et al. 2013). The imputation models included all covariates and dependent variables, however cases with imputed dependent variables were dropped (Von Hippel 2007). For the 1991 sample, this resulted in analytic samples of $N = 1042$ (age 4) and $N = 1003$ (first grade). For the 2001 sample, there were analytic samples of $N \sim 7850$ (age 4) and $N \sim 6450$ (kindergarten). For comparability and to reduce the possible role of sampling differences, analyses of the 2001 sample were also run on the subsample of children who had a mother 18 years or older when the child was born and were fluent in English. Analyses of this subgroup yielded similar results.

Measures

Measures were created in a parallel fashion for both datasets, except as noted.

Maternal employment

In each survey, mothers reported on their employment history and intensity, which were used to create categorical measures of the timing and intensity of first employment after childbirth. Several timing cut-offs were considered, culminating in a decision to delineate three mutually exclusive categories: first entry into employment full time (30 h per week or more) before 9 months, first entry into employment part time (<30 h per week) before 9 months, and no employment (termed non-employment) before 9 months. The timing and definitions of employment

intensity were chosen to match prior research (Brooks-Gunn et al. 2002, 2010; Coley and Lombardi 2013; Lombardi and Coley 2014).

Children's school readiness

Measures of children's reading or language skills, math skills, and conduct problems were selected at two time points in each sample that most closely aligned with children's entry into school. These measures are described in more detail below. All of the school readiness outcome measures were standardized to have a mean of 0 and a standard deviation of 1. This was done for two reasons: (1) to help adjust for differences in the measurement of the outcome variables between samples and between ages within samples, and (2) to ease interpretability of the results because coefficients represent a one standard deviation (*SD*) shift.

In the 1991 sample, children's skills were directly assessed at 4½ years and in first grade with the Woodcock Johnson Achievement and Cognitive Batteries (WJR; Woodcock and Johnson 1989), an assessment of children's cognitive skills and achievement that has been shown to have good reliability and validity (McGrew et al. 1991). Children's language skills were measured with the Letter-Words Identification subscale, which measures a student's word identification skills. Initial items require a student to identify individual letters in bold type. Most items require a student to read words of increasing difficulty in isolation (words are in list form). Children's math skills were assessed with the Applied Problems subscale, which measures quantitative reasoning, math achievement, and math knowledge. It requires children to analyze and solve practical mathematics problems presented orally while being shown pictured objects. Vertically equated *W*-scores were used, which measure children's achievement and item difficulty on the same scale (Mather and Jaffe 2002).

In the 2001 sample, children's skills were directly assessed at age 4 and kindergarten. These assessments were comprised of items drawn from well-validated standardized instruments including the *Peabody Picture Vocabulary Test Third Edition* (Dunn and Dunn 1997), the *PreLAS 2000* (Duncan and DeAvila 1998), the *Preschool Comprehensive Test of Phonological & Print Processing* (Lonigan et al. 2002), and the *Test of Early Mathematics Ability* (3rd ed.; Ginsburg and Baroody 2003). The early reading assessment (50 items at age 4, $\alpha = 0.84$; 74 items at kindergarten, $\alpha = 0.92$) consisted of items measuring early reading and language skills, including letter knowledge, word recognition, print conventions, and phonological awareness. The math assessment (46 items at age 4 $\alpha = 0.89$; 58 items at kindergarten, $\alpha = 0.92$) consisted of items assessing number sense, properties, operations, and probability.

Children's conduct problems were assessed with parent report in both samples. Parent reports were utilized because teacher reports on children's behavior were not available at ages 4 and 4½ years for all children. In the 1991 sample, mothers reported on their child's externalizing behaviors at both ages using the Child Behavior Check List (CBCL; Achenbach 1991). The CBCL is a widely used measure of social competence in children. Aggressive and destructive behaviors were rated on a 3-point scale from 0 (*not true of the child*) to 2 (*very true of the child*). The Cronbach's alpha for the scale was high at both time points (54 months $\alpha = 0.89$; first grade $\alpha = 0.84$).

In the 2001 sample, children's conduct problems were assessed on items drawn from the Preschool and Kindergarten Behavior Scales-Second Edition (Merrell 2003), the Social Skills Rating Scales (Gresham et al. 1987) and items created for the ECLS-B. Mothers rated the frequency of the child's engagement in impulsive, disruptive, and aggressive behaviors on 5-point scales ("never" to "very often"). Factor analyses led to the construction of a conduct problems scale that was comprised of 7 items (age 4 $\alpha = 0.78$; kindergarten $\alpha = 0.81$).

Covariates

Two other aspects of maternal employment characteristics were included in the models as covariates: 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 the child assessment. Indicators were also included for children's primary child care type reported by parents at 9 months. Child care type has been used as a proxy for child care quality in existing literature, given that center care has been found to be, on average, of higher quality relative to informal care settings (e.g., Coley et al. 2013; Votruba-Drzal et al. 2013). Responses were coded into center care, informal care (relative, non-relative, and home-based care), and parent care. Children reported to be in center or informal care for <10 h per week were coded as parent care.

Numerous child and maternal characteristics were incorporated as covariates following prior research (Brooks-Gunn et al. 2002; Hill et al. 2005; Lombardi and Coley 2014; 2017). Child characteristics included sex (girl omitted) and indicators for child race/ethnicity: non-Hispanic White (reference), non-Hispanic Black, Hispanic, Asian (this category was only large enough to separate in the 2001 sample), and Other, which included American Indian, Alaska natives, Native Hawaiian, other Pacific Islanders, multiracial, and Asian (only for the 1991 sample). An indicator was included if the child was born low birthweight (<2500 grams), had an older sibling(s) at birth, and if they had any younger sibling(s) before the assessment wave. Due

to a greater range in the timing of the assessments in the 2001 sample, children's age at the assessment and an indicator for entering kindergarten at wave 5 was included for this sample only. Similarly, due to an oversampling of twins in the 2001 sample, an indicator for a twin birth was included as a covariate for the 2001 sample only.

Several maternal characteristics were also included as covariates, including wave 1 measures of maternal age and years of education. Several time-varying characteristics were measured at each wave of data collection and averaged over time. Family structure was assessed with time-varying indicators of the mothers' marital status (married vs. not married) and having a working partner in the household. Family economics was assessed with time-varying indicators of receipt of welfare and household income, excluding the mother's income from employment, measured in units of 10,000 and averaged over the waves.

Statistical Analyses

To examine how the links between early maternal employment and children's school readiness have changed over time, OLS regression models were run within each sample, following prior literature (e.g., Brooks-Gunn et al. 2002, 2010; Coley and Lombardi 2013; Lombardi and Coley 2014; 2017). For each outcome and in each sample, a model was estimated:

$$\begin{aligned} \text{ChildOutcome}_i = & B_0 + B_1\text{FTEmp9mths}_i \\ & + B_2\text{PEmp9mths}_i + B_3\text{Child}_i \\ & + B_4\text{Maternal}_i + \varepsilon_i \end{aligned}$$

Here, children's functioning at school entry was estimated from the timing and intensity of mothers' entry into employment after childbirth (full time or part time by 9 months) with non-employment as the omitted category. Statistically significant differences between the full time and part time employment coefficients within each sample were examined with post hoc tests. A comprehensive set of covariates that have been shown to be associated with selection into employment were included in all models (Brooks-Gunn et al. 2002; 2010; Lombardi and Coley 2014). Although these covariates have been shown to account for much of the selection into employment in prior research, even the most comprehensive set of covariates leaves open potential omitted variable bias (Duncan et al. 2004). As a robustness check, models were re-estimated using a three-step propensity score weighting approach (Imbens 2000). The first step was to estimate the propensity of mothers to be in each employment group, utilizing multinomial logistic regression models as a function of observed pretreatment covariates, including child sex, race/ethnicity, low birthweight, and mother's age, education, and pre-birth employment. Second, propensity score weights

were created by taking the inverse of the probability of being in the employment group that the child was actually in. Third, the models were re-estimated with these weights.

Following estimating the regression models within each sample, the regression estimates were compared across samples to examine whether the associations between early maternal employment patterns and children's school readiness had changed over time. Following best practices, estimates were statistically compared by calculating Z scores to compare the regression coefficients across the two models (Clogg et al. 1995; Paternoster et al. 1998).

To determine how the patterns of change over time differed across family income groups, the analysis process described above was repeated within subgroups. Specifically, analyses were rerun within low-, middle-, and high-income groups using income-to-needs during the child's first year: low-income was an income-to-needs <2, middle-income between 2 and 4, and high-income greater than 4. Following estimation of the models within each subgroup, the regression coefficients were again compared between the samples using Z scores.

All analyses for the 2001 sample were weighted with jackknife replicate weights, which adjust for sampling procedures, nonresponse, and properly adjust standard errors. Although studies assessing change over time use a variety of methods to detect significant change, such as pooling samples and examining interactions by year, due to the 2001 sample weights and slight variation in the covariates, these techniques were not appropriate for the current study.

Results

Differences Between Cohorts

Table 1 presents descriptive statistics for each sample, and significant differences between the two samples. It is important to note that while the 2001 sample was nationally representative, the 1991 sample was not nationally representative. Prior research has found it to have, on average, slightly higher levels of income and education and lower proportions of racial and ethnic minorities (NICHD ECCRN 1997). With these differences in mind, in the 2001 sample, mothers were more likely to work by 9 months with it more likely that this work was part time. Mothers were equally likely to be working full time by 9 months in both samples. In 2001, mothers were less likely to be working prior to the child's birth and less likely to be employed later when the child was 4 years old and entering school. In contrast, there were no differences in the type of child care that children were enrolled in by 9 months, with similar percentages in center care, informal non-relative and relative care, and parent care between the two samples. Among the child

Table 1 Descriptive statistics by cohort

	Children born in 1991, N = 1042		Children born in 2001, N = 7850		Difference	
	M	SD	M	SD	p	t
Employment characteristics						
Non-employment by 9 mths	0.49	0.50	0.40	0.49	<0.001	5.56
Full time by 9 mths	0.37	0.48	0.37	0.48		
Part time by 9 mths	0.15	0.36	0.22	0.40	<0.001	5.37
Employed before birth	0.83	0.37	0.74	0.45	<0.001	6.18
Employed at 4 years	0.71	0.46	0.59	0.49	<0.001	7.48
Employed at 5/6 years	0.75	0.43	0.64	0.48	<0.001	7.03
Child care characteristics						
Center care by 9 mths	0.10	0.31	0.08	0.27		
Informal care by 9 months	0.36	0.48	0.34	0.48		
Parent care through 9 months	0.54	0.50	0.57	0.50		
Child characteristics						
Boy	0.50	0.50	0.50	0.50		
Race/ethnicity						
White	0.79	0.41	0.58	0.50	<0.001	12.99
Black	0.11	0.32	0.13	0.36		
Hispanic	0.06	0.23	0.21	0.38	<0.001	12.44
Asian	–	–	0.03	0.30	–	–
Other	0.04	0.20	0.05	0.32		
Low birthweight	0.03	0.16	0.02	0.30		
Older sibling(s)	0.55	0.50	0.65	0.46	<0.001	6.52
Younger sibling(s)	0.43	0.49	0.68	0.47	<0.001	16.05
Maternal characteristics						
Age (years)	28.54	5.56	28.53	6.39		
Education						
Less than high school	0.08	0.28	0.16	0.37	<0.001	6.73
High school	0.20	0.40	0.27	0.44	<0.001	4.88
Some college	0.33	0.47	0.46	0.50	<0.001	7.94
Bachelor's degree or more	0.38	0.49	0.27	0.45	<0.001	7.33
Marital status						
Married	0.78	0.38	0.70	0.43	<0.001	5.72
Working partner	0.81	0.32	0.73	0.37	<0.001	6.66
Welfare receipt	0.18	0.32	0.07	0.20	<0.001	13.94
Non-mat. income (10,000s)	5.16	3.76	4.33	3.82	<0.001	6.60

Means and standard deviations are reported. Values are weighted with sample weights for the 2001 sample. Only significance ($p < 0.001$) differences between samples are shown. In the 1991 sample, there was not a large enough sample of Asian children to analyze separately, so they were combined with the Other group. The N of the 2001 sample was rounded to nearest 50 per NCES requirements

SOURCE: Children born in 1991: NICHD Study of Early Child Care and Youth Development (SECCYD), birth to first grade data collection. Children born in 2001: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B), 9-month to kindergarten data collection

characteristics, coinciding with demographic changes in the U.S., the 2001 sample had a lower percentage of White children and a higher percentage of Hispanic children. Children were more likely to have an older sibling at birth and have a new younger sibling born before entering school in the 2001 sample. Among the maternal characteristics,

mothers were of similar ages, however the 2001 sample was less advantaged in comparison to the 1991 sample. On average, mothers in the 2001 sample had lower levels of education, were less likely to be married, were less likely to have a working partner, and had lower household incomes from other sources in comparison to mothers from the 1991 sample. There was also lower welfare receipt in the 2001 sample, which was likely reflective of changing welfare eligibility guidelines.

Characteristics of Children and Mothers Correlated with Early Employment Patterns

To assess how the characteristics of children and mothers correlated with the maternal employment patterns following childbirth changed from 1991 to 2001, descriptive statistics for each employment pattern and significant differences on them between the two samples are shown in Table 2. Within the context of the differences in the samples from Table 1, several patterns emerged. First, employment before birth was more common among mothers employed part or full time by 9 months in 2001, while non-employment before birth in 2001 was more predictive of non-employment in the first 9 months. Second, higher proportions of mothers who were non-employed or part time employed by 9 months in the 1991 sample entered or stayed employed later, whereas these mothers in 2001 were less likely to be working later. Third, center and informal child care became less common among children of mothers not employed by 9 months while it became more common among mothers employed full time by 9 months. Child care type was similar between samples among mothers employed part time by 9 months. Fourth, full time employment by 9 months became more common among mothers of Black children, while non-employment by 9 months became less common. Fifth, despite lower rates of marriage and non-maternal household incomes in the 2001 sample relative to the 1991 sample, there were no differences in these characteristics for the mothers not employed by 9 months between the two samples. This suggests that unmarried mothers and those with lower non-maternal household incomes were more likely to be employed part or full time in the 2001 sample.

Associations between Early Employment Patterns and Children's School Readiness

Full samples

The primary goal was to understand how associations between early maternal employment and children's school readiness changed between children born in 1991 and in 2001 (Table 3). Given differences between the samples and changing selection factors into employment, described above, all

Table 2 Descriptive statistics on maternal employment following childbirth, 1991 and 2001

	No work by 9 months			Full time by 9 months			Part time by 9 months			Difference						
	2001, N = 3300		t	2001, N = 388		t	2001, N = 1600		t	2001, N = 158		t				
	M	SD		M	SD		M	SD		M	SD					
Employment characteristics																
Employed before birth	0.71	0.45	0.49	0.50	<0.001	13.50	0.90	0.10	0.93	0.27	3.55	<0.001	0.87	0.35	<0.001	6.79
Employed at 4 years	0.62	0.48	0.36	0.49	<0.001	16.13	0.78	0.42	0.79	0.39	3.55	<0.001	0.66	0.47	<0.001	7.85
Employed at 5/6 years	0.71	0.45	0.46	0.50	<0.001	15.34	0.81	0.39	0.82	0.37	3.55	<0.001	0.68	0.47	<0.001	4.56
Child care characteristics																
Center care by 9 months	0.11	0.31	0.02	0.15	<0.001	15.47	0.12	0.32	0.17	0.36	-4.27	<0.001	0.07	0.25	0.07	0.25
Informal care by 9 months	0.26	0.44	0.10	0.32	<0.001	14.43	0.49	0.50	0.61	0.49	-7.41	<0.001	0.32	0.47	0.33	0.47
Parent care through 9 months	0.62	0.48	0.88	0.35	<0.001	-21.5	0.39	0.49	0.22	0.42	12.02	<0.001	0.61	0.49	0.60	0.49
Child characteristics																
Boy	0.48	0.50	0.50	0.50			0.52	0.50	0.51	0.50			0.51	0.50	0.50	0.50
Race/ethnicity																
White	0.76	0.43	0.58	0.50	<0.001	11.09	0.82	0.50	0.55	0.50	16.38	<0.001	0.81	0.39	0.65	0.50
Black	0.14	0.35	0.11	0.34	<0.01	2.67	0.07	0.39	0.17	0.39	7.78	<0.001	0.12	0.33	0.10	0.34
Hispanic	0.05	0.21	0.24	0.40	<0.001	15.10	0.07	0.26	0.20	0.36	11.27	<0.001	0.05	0.22	0.19	0.38
Asian	-	-	0.03	0.32			-	-	-	0.03	0.37		-	-	0.02	0.23
Other	0.05	0.22	0.04	0.30			0.04	0.20	0.05	0.32			0.02	0.14	0.05	0.35
Low birthweight	0.02	0.15	0.02	0.32			0.03	0.17	0.01	0.00	10.42	<0.001	0.02	0.14	0.01	0.00
Older sibling(s)	0.57	0.49	0.71	0.44	<0.001	9.52	0.46	0.50	0.61	0.48	9.43	<0.001	0.71	0.45	0.61	0.47
Younger sibling(s)	0.42	0.49	0.69	0.47	<0.001	17.33	0.43	0.50	0.66	0.48	14.46	<0.001	0.44	0.50	0.70	0.47
Maternal characteristics																
Age (years)	28.60	5.7	28.3	6.57			28.4	5.36	29	6.06	3.19	<0.001	28.63	5.50	28.14	6.4
Education																
Less than high school	0.10	0.30	0.23	0.42	<0.001	9.67	0.06	0.24	0.10	0.29	4.26	<0.001	0.09	0.28	0.14	0.36
High school	0.20	0.40	0.28	0.44	<0.001	5.57	0.22	0.41	0.28	0.44	4.17	<0.001	0.16	0.37	0.23	0.44
Some college	0.34	0.47	0.41	0.49	<0.001	4.35	0.34	0.47	0.50	0.50	9.77	<0.001	0.30	0.46	0.51	0.50
Bachelor's degree or more	0.36	0.48	0.24	0.44	<0.001	8.18	0.38	0.48	0.29	0.47	5.79	<0.001	0.45	0.50	0.32	0.45
Married	0.74	0.74	0.72	0.43			0.81	0.34	0.68	0.42	9.58	<0.001	0.79	0.37	0.71	0.44
Working partner	0.77	0.36	0.75	0.37			0.87	0.25	0.71	0.36	13.91	<0.001	0.82	0.31	0.75	0.37
Welfare receipt	0.22	0.37	0.09	0.23	<0.001	15.74	0.12	0.25	0.04	0.15	14.71	<0.001	0.19	0.33	0.06	0.21
Non-maternal income (10,000s)	4.86	3.9	4.96	4.31			5.56	3.71	3.37	2.97	21.66	<0.001	5.13	3.40	4.79	3.9

Means and standard deviations are reported. Values are weighted with sample weights for the 2001 sample. Only significance ($p < 0.05$) differences between samples are shown. In the 1991 sample, there was not a large enough sample of Asian children in analyze separately, so they were combined with the Other group. For the full samples, 1991 $N = 1042$ and 2001 $N = 7850$ (rounded to nearest 50 per NCES requirements)

SOURCE: Children born in 1991: NICHD Study of Early Child Care and Youth Development (SECCYD), birth to first grade data collection. Children born in 2001: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B), 9-month to kindergarten data collection

Table 3 Associations between maternal employment and children's school readiness skills, 1991 and 2001

	Skills at Age 4				Skills at School Entry			
	1991	2001	Difference		1991	2001	Difference	
	<i>N</i> = 1042	<i>N</i> ~ 7850	<i>p</i>	<i>z</i>	<i>N</i> = 1003	<i>N</i> ~ 6450	<i>p</i>	<i>z</i>
Reading/language skills								
Employment by 9 mths								
FT < 9 mths vs. non-emp	-0.13(0.06)*	0.01(0.04)	<0.05	1.91	-0.08(0.07)	0.08(0.04) ⁺	<0.05	1.91
PT < 9 mths vs. non-emp	-0.04(0.08)	0.03(0.04)			0.03(0.09)	-0.02(0.04)		
FT < 9 mths vs. PT < 9 mths	-0.09(0.08)	-0.02(0.04)			-0.11(0.09)	0.09(0.04)*	<0.05	2.00
Employment characteristics								
Employed before birth	0.09(0.08)	0.03(0.03)			-0.01(0.09)	0.05(0.04)		
Employed at outcome	-0.04(0.06)	0.04(0.03)			0.10(0.07)	0.07(0.03)*		
Child care characteristics								
Center care by 9 mths	-0.12(0.09)	0.08(0.05)	<0.05	1.86	-0.04(0.11)	0.07(0.06)		
Informal care by 9 months	-0.02(0.06)	0.02(0.03)			0.01(0.07)	-0.03(0.04)		
Child characteristics								
Boy	-0.17(0.05)**	-0.16(0.02)**			-0.13(0.06)*	-0.15(0.03)**		
Black	-0.15(0.1)	0.02(0.04)			-0.30(0.11)**	0.07(0.04) ⁺	<0.01	3.08
Hispanic	-0.26(0.12)*	-0.25(0.03)**			-0.08(0.13)	-0.12(0.04)**		
Asian	-	0.29(0.05)**			-	0.42(0.05)**		
Other	0.29(0.13)*	0.06(0.06)			0.07(0.15)	-0.01(0.06)		
Low birthweight	-0.11(0.17)	-0.21(0.03)**			0.04(0.19)	-0.28(0.04)**		
Older sibling(s)	-0.40(0.06)**	-0.24(0.03)**	<0.01	2.37	-0.26(0.07)**	-0.18(0.03)**		
Younger sibling(s)	-0.10(0.06) ⁺	0.01(0.04)			-0.03(0.07)	-0.02(0.04)		
Child age at outcome	-	0.07(0.00)**			-	0.08(0.00)**		
Twin	-	-0.09(0.03)**			-	-0.10(0.03)**		
Kindergarten entry wave 4	-	-			-	0.04(0.01)**		
Maternal characteristics								
Age (years)	-0.01(0.01)	0.01(0.00)*	< 0.05	2.32	-0.01(0.01)	0.00(0.00)		
Years of education	0.10(0.01)**	0.10(0.01)**			0.08(0.02)**	0.08(0.01)**		
Married	0.22(0.12) ⁺	0.10(0.04)*			0.07(0.14)	0.14(0.05)**		
Working partner	-0.18(0.14)	-0.02(0.05)			-0.04(0.15)	0.02(0.06)		
Welfare receipt	-0.46(0.13)**	-0.19(0.07)**			-0.53(0.14)**	-0.28(0.09)**		
Non-maternal income (10,000s)	0.02(0.01)*	0.04(0.00)**	<0.01	2.39	0.01(0.01)	0.04(0.01)**	<0.01	3.04
Math skills								
FT < 9 mths vs. non-emp	-0.05(0.06)	0.04(0.04)			0.00(0.07)	0.04(0.04)		
PT < 9 mths vs. non-emp	0.06(0.08)	0.04(0.04)			0.08(0.08)	-0.04(0.04)		
FT < 9 mths vs. PT < 9 mths	-0.11(0.08)	0.00(0.03)			-0.09(0.09)	0.08(0.04)*	<0.05	1.76
Conduct problems								
FT < 9 mths vs. non-emp	0.03(0.07)	0.06(0.04)			0.14(0.07) ⁺	0.10(0.05)*		
PT < 9 mths vs. non-emp	-0.04(0.09)	0.00(0.04)			-0.06(0.09)	0.08(0.05) ⁺		
FT < 9 mths vs. PT < 9 mths	0.06(0.09)	0.05(0.04)			0.20(0.09)*	0.02(0.05)	<0.05	1.70

Values are weighted with sample weights for the 2001 sample. Outcomes have been standardized to have a mean of 0 and SD of 1. Standard errors are shown in parentheses. Only significant differences ($p < 0.05$) between cohorts are shown. All models control for the covariates shown for the first model. Per NCES requirements, the size of the 2001 sample is rounded to the nearest 50. ⁺ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$

SOURCE: Children born in 1991: NICHD Study of Early Child Care and Youth Development (SECCYD), birth to first grade data collection. Children born in 2001: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B), 9-month to kindergarten data collection

models controlled for these characteristics. As expected, estimates differed slightly from those reported in earlier research on these samples due to differences in the analytic models, which were made for the purposes of comparison. Among children born in 1991, full time employment before 9 months was associated with lower language skills at age 4 relative to non-employment (0.13 SDs), as well as higher conduct problems at school entry in comparison to part time employment (0.20 SDs). Among children born in 2001, children of mothers employed full time by 9 months had higher reading scores at school entry in comparison to children of mothers employed part time (0.09 SDs), as well as higher math skills at school entry relative to part time employment (0.08 SDs). Conversely, full time employment by 9 months was associated with higher conduct problems at school entry relative to non-employment (0.10 SDs).

To examine change between the two samples, *Z* scores were calculated. There was evidence of a small positive shift in the association between full time employment before 9 months and children's reading/language skills at age 4 and at school entry. For children of mothers employed before 9 months, children's reading/language skills positively improved by 0.14 SDs at age 4 and by 0.16 SDs at school entry from 1991 to 2001 in comparison to children of non-employed mothers. There was also evidence of a small positive shift in the association between full time employment and part time employment before 9 months and children's academic skills at school entry. Specifically, for children of mothers employed full time relative to part time before 9 months, children's reading/language skills positively improved 0.20 SDs and children's math skills positively improved 0.17 SDs. Conversely, for conduct problems, there was a small negative shift (0.18 SDs) in the association between part time employment by 9 months relative to full time. Specifically, whereas children with mothers employed part time by 9 months had lower conduct problems relative to children with mothers employed full time in 1991, by 2001, children of mothers employed both part and full time before 9 months had similar levels of conduct problems.

Two other specifications were examined. First, given sampling differences, the 2001 models were run on the subsample of children who had a mother 18 years or older at birth and fluent in English. Results were substantially similar. Second, the models were re-estimated using propensity score weights (Imbens 2000). The pattern of results for both samples were consistent with the OLS estimates.

Differences by family income

Table 4 shows results within low-, middle-, and high-income families in each sample. Among children born in 1991 in low-income families, there were no significant associations between part or full time employment by

9 months and children's school readiness. For children born in 2001 in low-income families, full time employment by 9 months was associated with higher reading/language skills at school entry relative to non-employment (0.11 SDs) and higher conduct skills relative to part time employment (0.16 SDs). There were no significant associations for children from middle-income families in either sample. Among children born in 1991 in high-income families, mothers' part time employment by 9 months was associated with higher reading/language skills at age 4 and school entry relative to full time employment (age 4 0.31 SDs; school entry 0.48 SDs) and higher reading/language skills at school entry in comparison to non-employment (0.32 SDs). Full time employment by 9 months was linked with higher conduct problems at school entry relative to part time employment (0.34 SDs) and non-employment (0.23 SDs). For children born in 2001 in high-income families, part time employment before 9 months was associated with lower reading/language skills relative to non-employment by 9 months (0.19 SDs).

To assess change from 1991 to 2001, *Z* scores are shown. Among low-income families, full time employment before 9 months relative to non-employment was associated with higher age 4 reading/language (0.25 SDs) and math skills (0.35 SDs) from 1991 to 2001. Among middle-income families, there were more positive associations between part time employment relative to non-employment for children's school entry reading/language skills from 1991 to 2001 (0.31 SDs). Among high-income families, from 1991 to 2001, part time employment became less positive for children's reading/language skills relative to non-employment (age 4 0.32 SDs; school entry 0.51 SDs) and full time employment (age 4 0.36 SDs; school entry 0.61 SDs). Part time employment by 9 months was associated with lower math skills relative to non-employment at school entry (0.34 SDs) and full time employment (0.39 SDs). Part time employment relative to full time employment shifted to having less positive associations with conduct problems over the decade (age 4 0.37 SDs; school entry 0.36 SDs).

Discussion

Although gender equality has risen in public discourse, the U.S. has a stagnant gender wage gap and limited policy supports for working parents, particularly around the time of childbirth (Blau and Kahn 2017; Ruhm 2011; Teti et al. 2017; Waldfogel et al. 2019). Perhaps it is not surprising that fewer mothers report wanting to work full time, motherhood wage penalties have risen, and the employment rates of U.S. mothers have stagnated, falling behind that of comparable countries (Collins 2019; Cotter et al. 2013; OECD 2016; Taylor et al. 2007; U.S. Department of Labor

Table 4 Maternal employment and children's school readiness skills within income groups, 1991 and 2001

	Skills at age 4		Difference		Skills at school entry		Difference	
	1991	2001	<i>p</i>	<i>z</i>	1991	2001	<i>p</i>	<i>z</i>
Low Income	<i>N</i> = 291	<i>N</i> ~ 3950			<i>N</i> = 275	<i>N</i> ~ 3350		
Reading/language skills								
FT < 9 mths vs. non-emp	-0.23(0.13) ⁺	0.02(0.04)	<0.05	1.78	-0.07(0.16)	0.11(0.06) [*]		
PT < 9 mths vs. non-emp	-0.12(0.15)	0.09(0.04) [*]			0.02(0.17)	0.03(0.06)		
FT < 9 mths vs. PT < 9 mths	-0.11(0.17)	0.07(0.04)			-0.09(0.19)	0.09(0.06)		
Math skills								
FT < 9 mths vs. non-emp	-0.29(0.16) ⁺	0.06(0.05)	<0.05	2.10	-0.13(0.14)	0.04(0.05)		
PT < 9 mths vs. non-emp	0.02(0.18)	0.08(0.05) ⁺			-0.08(0.16)	0.00(0.05)		
FT < 9 mths vs. PT < 9 mths	-0.31(0.20)	-0.02(0.05)			-0.05(0.18)	0.04(0.06)		
Conduct problems								
FT < 9 mths vs. non-emp	0.16(0.16)	0.10(0.06) ⁺			0.21(0.17)	0.11(0.07)		
PT < 9 mths vs. non-emp	0.08(0.18)	-0.06(0.06)			-0.01(0.18)	0.08(0.06)		
FT < 9 mths vs. PT < 9 mths	0.08(0.20)	0.16(0.06) ^{**}			0.21(0.21)	0.03(0.07)		
Middle income	<i>N</i> = 401	<i>N</i> ~ 1950			<i>N</i> = 384	<i>N</i> ~ 1550		
Reading/language skills								
FT < 9 mths vs. non-emp	-0.04(0.10)	-0.09(0.08)			-0.10(0.11)	-0.02(0.09)		
PT < 9 mths vs. non-emp	-0.10(0.12)	0.05(0.08)			-0.25(0.14) ⁺	0.06(0.08)	<0.05	1.95
FT < 9 mths vs. PT < 9 mths	0.05(0.13)	-0.14(0.07) ⁺			0.15(0.14)	-0.08(0.09)		
Math skills								
FT < 9 mths vs. non-emp	0.00(0.10)	-0.10(0.08)			0.08(0.10)	-0.01(0.09)		
PT < 9 mths vs. non-emp	0.02(0.12)	-0.01(0.08)			0.07(0.13)	-0.03(0.08)		
FT < 9 mths vs. PT < 9 mths	-0.02(0.13)	-0.09(0.07)			0.01(0.13)	0.02(0.09)		
Conduct problems								
FT < 9 mths vs. non-emp	-0.18(0.11)	0.03(0.08)			-0.02(0.11)	0.13(0.11)		
PT < 9 mths vs. non-emp	-0.05(0.14)	0.05(0.07)			-0.07(0.14)	0.11(0.08)		
FT < 9 mths vs. PT < 9 mths	-0.13(0.15)	-0.02(0.07)			0.05(0.15)	0.02(0.10)		
High Income	<i>N</i> = 350	<i>N</i> ~ 1950			<i>N</i> = 344	<i>N</i> ~ 1550		
Reading/language skills								
FT < 9 mths vs. non-emp	-0.13(0.11)	-0.09(0.11)			-0.16(0.11)	-0.06(0.09)		
PT < 9 mths vs. non-emp	0.18(0.15)	-0.14(0.10)	<0.05	1.74	0.32(0.16) [*]	-0.19(0.09) [*]	<0.01	2.78
FT < 9 mths vs. PT < 9 mths	-0.31(0.15) [*]	0.05(0.09)	<0.05	2.02	-0.48(0.16) ^{**}	0.13(0.07) ⁺	<0.001	3.42
Math skills								
FT < 9 mths vs. non-emp	0.00(0.09)	0.00(0.09)			-0.02(0.11)	0.04(0.09)		
PT < 9 mths vs. non-emp	0.12(0.12)	-0.01(0.08)			0.26(0.15) ⁺	-0.08(0.10)	<0.05	1.87
FT < 9 mths vs. PT < 9 mths	-0.12(0.12)	0.01(0.07)			-0.27(0.16) ⁺	0.12(0.07)	<0.05	2.28
Conduct problems								
FT < 9 mths vs. non-emp	0.15(0.11)	0.03(0.10)			0.23(0.11) [*]	0.06(0.12)		
PT < 9 mths vs. non-emp	-0.17(0.16)	0.08(0.09)			-0.11(0.15)	0.04(0.10)		
FT < 9 mths vs. PT < 9 mths	0.32(0.16) ⁺	-0.05(0.08)	<0.05	2.03	0.34(0.15) [*]	0.02(0.09)	<0.05	1.82

Values are weighted with sample weights for the 2001 sample. Outcomes have been standardized to have a mean of 0 and SD of 1. Standard errors are shown in parentheses. Only significant differences ($p < 0.05$) between cohorts are shown. All estimates control for a rich set of covariates, which included indicators for child care type by 9 months, child sex, race/ethnicity, low birthweight, older sibling(s) at birth, and younger sibling(s) as well as mothers' age, education, employment before birth and at assessment, and time-varying measures of mothers' marital status, working partner, welfare receipt, and non-maternal household income. For the 2001 sample only, models also controlled for the child's age at assessment, twin status, and wave of entry into kindergarten for the age 5 outcomes. Per NCES requirements, the size of the 2001 sample is rounded to the nearest 50. ⁺ $p < 0.10$, ^{*} $p < 0.05$, ^{**} $p < 0.01$

SOURCE: Children born in 1991: NICHD Study of Early Child Care and Youth Development (SECCYD), birth to first grade data collection. Children born in 2001: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B), 9-month to kindergarten data collection

2018; Weeden et al. 2016). Drops in maternal employment rates during the COVID-19 pandemic have further highlighted the unstable nature of maternal employment (Landivar et al. 2020). Yet, there is also evidence of the benefits of early maternal employment (Becker and Tomes 1986; Bianchi 2000; Heinrich 2014; Hoffman 1989; Raver 2003) and high levels of public support for family leave policies (Isaacs et al. 2017; Waldfogel et al. 2019). Still, there are notable and significant differences in the experiences of mothers in the labor market related to family income (Heinrich 2014), with implications for how these experiences relate to children's development (Berger et al. 2008; Coley and Lombardi 2013). This study employed two large, longitudinal surveys of children born in the U.S. to compare whether the associations between early maternal employment and children's outcomes changed from 1991 to 2001, asking this question within the full samples of children and within low-, middle-, and high-income families. Although existing studies have already explored similar questions within each dataset (e.g., Brooks-Gunn et al. 2002; 2010; Lombardi and Coley 2014), the current study synthesizes this work into a single study that sought to use identical measures and statistical methodologies.

Correlates of Early Maternal Employment in 1991 and 2001

There were notable changes in the demographics of non-employed and employed mothers between the two samples. Overall, non-employed and part time employed mothers in 1991 were less likely to be in the labor force several years later, whereas remaining in or re-entering the labor force in the several years after birth was more common among mothers in 1991. In 2001, mothers of Black children were more likely to be employed full time by 9 months and less likely to be non-employed. Among mothers employed full time by 9 months, center and informal child care became more common over the decade. Broadly, while there was heterogeneity in their characteristics, mothers employed full or part time by 9 months in 2001 were less advantaged in comparison to early employed mothers in 1991. There were historic changes to the welfare program and expansions to child care subsidies and the EITC that occurred between 1991 and 2001, pushing lower-income mothers into the labor market (Haskins 2006; Heinrich 2014; Kamerman and Gatenio-Gabel 2007). Simultaneously, more advantaged mothers scaled back their labor market participation to meet the demands of child rearing in dual-income households in which fathers increasingly work longer hours (Cha 2010; Weeden et al. 2016). Combined, results lend support for the hypothesis that some of the selection effects associated with early maternal employment changed over time.

Early Maternal Employment and Children's School Readiness

Controlling for these changing selection characteristics, there was evidence of a small positive shift in the association between full time employment before 9 months and children's reading/language skills at age 4 and school entry. Full time employment became associated with higher reading/language skills at both time points over the decade. There was also evidence of a small shift in the association between part time employment by 9 months relative to full time employment during this time period for children's conduct problems, with children of mothers employed part time by 9 months in 2001 having higher levels of conduct problems that were comparable to children of mothers employed full time. As maternal employment became more entrenched in society following several decades of sizeable proportions of mothers in the labor force, it is possible that coinciding changes in cultural attitudes, child care resources, and responsibilities by partners and extended family members reduced the negative implications of less maternal time for children's academic preparedness (Donnelly et al. 2016; Kamerman and Gatenio-Gabel 2007; Pilkauskas et al. 2020; Sayer et al. 2004). It is also possible that the results relate more to changes in the experiences of children with non-employed mothers. For example, there is evidence that fathers increasingly work longer hours and mothers work less due to this overwork (Cha 2010; Weeden et al. 2016). It may be that fathers increased work exerted more stress on non-employed mothers over time and, thus, the stress experienced by both employed and non-employed mothers of children born in 2001 was more similar than it had been a decade earlier. More research is needed to understand the implications of family-level employment experiences for children's development. Prior research from the U.S. and other countries have shown that paid and unpaid maternal leave policies promote job continuity, increase the likelihood of women returning to their pre-birth jobs, and women's long-term labor market success (Hofferth 1996; Ruhm 2011; Waldfogel et al. 2019). Taken together, these results suggest that a federal paid maternal leave policy or expanding state-level paid maternal leave policies may benefit children's development through supporting mothers' ties to the labor market after childbirth.

There was also evidence of consistent negative links between full time employment before 9 months and children's later conduct problems over the decade and an indication that early part time employment, which had been associated with fewer conduct problems at school entry in comparison to full time employment in 1991, became more similar to full time work. The findings regarding early full time maternal employment coincides with research on early child care finding links between greater hours of center care

and elevated child behavior problems in both samples used in this study (Coley et al. 2013; NICHD ECCRN 2003). However, there were no differences in child care type among mothers employed part time between the two samples, so changes in the use of center care among part time employed mothers do not explain these findings. As one possible explanation for why part time employment shifted over the decade to being more similarly associated with children's later higher conduct problems, it could be the changing nature of part time employment from 1991 to 2001, in terms of compensation, benefits, flexibility, or autonomy. There has been an increase in unpredictable and uncertain work schedules since the 1970's (Kalleberg 2009). It is possible that part time work arrangements for mothers of infants shifted from being more stable and consistent to being less certain and predictable, thereby providing fewer benefits of work (Bianchi 2000; Hoffman 1989; Raver 2003) or imposing greater strains on mothers and families (Borelli et al. 2017; Holmes et al. 2018; Kalleberg 2009). Policies that increase supports for parents, such as paid parental leave, workplace flexibility and paid sick days, and access to affordable and high quality child care may reduce these strains and thus benefit children. It was not possible to examine these potential explanations in the current data in a comparable way and further research in this area is needed.

Differences by family income

Findings indicated that the small positive shift in the associations between early full time employment and later reading/language skills were driven by children from low-income families and there was evidence that these positive associations extended to early math skills. These findings coincide with research finding benefits of early maternal employment for children from low-income families (Coley and Lombardi 2013; Lombardi and Coley 2014), and suggest that these positive associations increased over time for this group. It is possible that improvements in the child care system and expanded child care subsidies contributed to these positive shifts in children's development, through increased access to higher quality child care settings for children from low-income families (Heinrich 2014; Kamerman and Gatenio-Gabel 2007; Votruba-Drzal et al. 2013). It is also possible that the economic and psychological benefits of employment for mothers and families grew over time (Becker and Tomes 1986; Bianchi 2000; Heinrich 2014; Hoffman 1989; Parcel and Menaghan 1997; Raver 2003), translating into improved parenting and home environments (Lombardi 2021). It was not possible to test all of these hypotheses in the current study, however evidence that early full time employment became more beneficial for children from low-income families has important

policy implications. Specifically, paid maternal leave, child care subsidies, paid sick days, and other employment policies that have been found to promote employment continuity may benefit children, as well as mothers and families (Hofferth 1996; Ruhm 2011; Waldfogel et al. 2019).

For children from middle-income families, there were small positive shifts of early part time employment for children's later reading/language skills. There is little existing research focused explicitly on early maternal employment in middle-income families, and the positive shift over the decade of part time early employment for children's reading/language skills at school entry was unique to children in this income group. The prevalence of child care type did not change over the decade for children of mothers employed part time, however it is possible that the quality improved for children in center care settings (Bredenkamp and Copple 1997; Kamerman and Gatenio-Gabel 2007) and provided benefits to the development of children's reading/language skills (Votruba-Drzal et al. 2013). Further research is needed on parental work in middle-income families given the specific constraints these families face with a lack of policy support, through paid parental leave or child care subsidies, yet high child care costs and likely a greater reliance on maternal income from employment (Ruhm 2011; Teti et al. 2017).

Among high-income families, maternal entries into part time employment within 9 months after childbirth shifted to having more negative links with children's school readiness over the decade, being associated with lower reading/language skills and higher conduct problems. Results also revealed that the shift in full time employment being associated with higher reading/language skills over the decade in the full sample were not evident for these families. For high-income families, the added benefits of economic and psychological resources from employment (Bianchi 2000; Hoffman 1989; Raver 2003) may not have outweighed the challenges for families (Borelli et al. 2017; Chase-Lansdale and Owen 1987; Hoffman 1989; Holmes et al. 2018). It is also possible that these families were most impacted by fathers working longer hours (Cha 2010; Weeden et al. 2016) or the more precarious aspects of part time employment (Kalleberg 2009). Further research on parental employment in higher earning families is needed to understand these findings and identify potential policy solutions.

Limitations and Conclusions

In interpreting the results, it is essential to acknowledge the limitations. First, although the 2001 sample was a nationally representative sample, the 1991 sample was not. Descriptive data indicates that the 1991 sample was slightly more

advantaged and had fewer racial and ethnic minority children. These two samples were chosen because they included a large sample of children born in a single year in the U.S. and the studies had many other similarities in terms of the timing and methods of assessment. To investigate differences across families, analyses were run within family income subgroups for each sample. Nevertheless, statistical power in the 1991 sample subgroups was limited and it would be ideal to have two representative birth cohort studies of U.S. children, which, regrettably, does not exist. In particular, it is important to ask these questions within racial and ethnic subgroups of families, which have different experiences of maternal employment and existing research has found to be differentially linked with children's development (Berger et al. 2008; Coley and Lombardi 2013).

It is also important to acknowledge the later cohort was born in 2001 and since this time there have continued to be marked shifts in policies and cultural norms. Therefore, it is important that future research ask these questions among more recent cohorts of children. It is also important to acknowledge that the employment variables only measured mothers' first job following childbirth and did not address mothers' full employment histories, nor did they address other factors such as employment satisfaction or quality. Relatedly, this study was not able to assess changes in children's home or child care environments with measures of parenting or child care quality. Also, although the variables were measured in similar ways through maternal reports of employment, direct assessments of children's academic skills, and maternal reports of children's conduct problems, there may still be measurement bias due to changing cultural norms and expectations, particularly in regards to the maternal reports. Perceptions of children's conduct problems may have differed between employed and non-employed mothers between 1991 and 2001, introducing bias in understanding changes and similarities in these associations. Finally, although the models controlled for a wide range of measured characteristics of children, mothers, and families that might predispose women into employment patterns and also affect child functioning, results are correlational.

In the context of these cautions, the findings suggest that early maternal employment following childbirth shifted over time such that small negative associations of full time maternal employment by 9 months for children's later reading/language skills among children born in 1991 were more positive for children born in 2001. Conversely, there was also evidence that early full time maternal employment was associated with elevated conduct problems at school entry consistently across the decade, and part time employment had similar negative associations by 2001. Future research is needed to understand why maternal

employment may benefit children's academic skills and how children's early behavioral skills can be better supported in the context of most mothers in the U.S. working (U.S. Department of Labor 2018). There was heterogeneity in the patterns of change across families of different incomes, indicating the importance of examining these questions among subgroups of families. Overall, as early maternal employment has become more normative, there is evidence of positive benefits emerging for children's reading/language school readiness and consistent negative links with children's behavioral skills at school entry.

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Compliance with Ethical Standards

Conflict of Interest The author declares no competing interests.

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