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Job Displacement Among Single Mothers::

Effects on Children's Outcomes in Young Adulthood*

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Abstract

Given the recent era of economic upheaval, studying the effects of job displacement has seldom been so timely and consequential. Despite a large literature associating displacement with worker well-being, relatively few studies focus on the effects of parental displacement on child well-being, and fewer still focus on implications for children of single parent households. Moreover, notwithstanding a large literature on the relationship between single motherhood and children's outcomes, research on intergenerational effects of involuntary employment separations among single mothers is limited. Using 30 years of nationally representative panel data and propensity score matching methods, we find significant negative effects of job displacement among single mothers on children's educational attainment and social-psychological well-being in young adulthood. Effects are concentrated among older children and children whose mothers had a low likelihood of displacement, suggesting an important role for social stigma and relative deprivation in the effects of socioeconomic shocks on child well-being.

Keywords

job displacement; unemployment; single mothers; young adulthood; educational attainment; social-psychological well-being; causal inference; propensity score matching

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1 Introduction

Given the deep and broad recent economic downturn, studying the effect of job displacement on families has seldom been so timely and consequential. One in seven children in the U.S. under the age of 18 (i.e., 10.5 million children), had an unemployed parent in 2010, a number nearly double those who had an unemployed parent prior to the downturn (Lovell and Isaacs 2010). An even larger number of children had a parent displaced from a job, a form of involuntary job loss that occurs as a result of the operating decisions of employers, i.e., when firms downsize, restructure, close plants or relocate, as opposed to job separation that occurs when workers are fired or leave jobs voluntarily. Yet worker displacement is not limited to economic downturns. Over the last several decades, economic reorganization in the U.S. has been characterized by waves of job displacement, increasingly widespread job insecurity, and the perceived disappearance of a lifetime job with a single employer for growing segments of the workforce (Farber 2010; Farley 1996; Kalleberg 2000, 2009; Levy 1995; Wetzel 1995). Prior research suggests that job displacement is associated with subsequent non-employment, long-term earnings losses, and lower job quality; declines in physical and mental well-being; new patterns of interaction and involvement with family and peers; and loss of psychosocial assets and personal assessment in relation to societal norms and unemployment stigmatization (Brand 2006; Brand and Burgard 2008; Catalano et al. 2011; Cha and Morgan 2010; Chan and Stevens 2001; Charles and Stephens 2004; Couch and Placzek 2010; Fallick 1996; Farber 2005; Jacobson, LaLonde, and Sullivan 1993; Jahoda 1982; Jahoda, Lazarsfeld, and Zeisel 1933 [1971]; Kletzer 1998; Newman 1988; Pearlin et al. 1981; Podgursky and Swaim 1987; Ruhm 1991 Seitchik 1991; von Wachter 2010).

Notwithstanding this body of research on the effects of displacement on workers, we know relatively less about effects of parental displacement on children, and thus about the intergenerational impact of a consequential household event. A few recent studies find significant negative effects of parental job loss on children's academic achievement, socioeconomic status, and social-psychological well-being (e.g., Johnson, Kalil, and Dunifon 2012; Kalil and Ziol-Guest 2005, 2008; Oreopoulos, Page, and Stevens 2008; Page, Stevens, and Lindo 2009). However, these studies largely treat fathers as the essential component in the displacement equation; indeed, little work has examined the consequences of job displacement among mothers, and even fewer studies have focused on single mothers. As a large proportion of children in the U.S. will spend some part of their childhood raised by a single mother, and single mother families are a vulnerable population for which job displacement may be acutely taxing, we attend to effects on the children of displaced single mothers. While there is a large literature on the socioeconomic and social-psychological outcomes of children who grow up with single mothers [see Crosnoe and Cavanagh (2010) and McLanahan and Percheski (2008) for recent reviews], much of this work treats single mothers' labor market experience as a static state: women are either employed or unemployed, each with its associated trials for raising children. Although some recent research takes trajectories of labor force experiences among single mothers more seriously, this work largely treats those career trajectories as voluntary. Such studies hence face challenging problems of selection bias. Less subject to selection concerns, the study of job

displacement provides a unique opportunity to assess how socioeconomic hardship among single mothers affects the well-being of children. Displacement not only provides a sounder basis for studying the intergenerational impact of socioeconomic circumstances, but a substantial number of parents separate from jobs as a result of economic conditions rather than voluntary choices, and we should understand the potential intergenerational consequences of such events.

In this paper, we present evidence as to the effects of job displacement among single mothers on children's subsequent educational and social-psychological outcomes in young adulthood. Using data from the National Longitudinal Survey of Youth (NLSY) and from the National Longitudinal Survey's Child-Mother File (NLSCM), we match children whose single mothers were and were not displaced from their jobs but had the same propensity to be displaced based on a set of observed covariates. Matching is an intuitive approach for adjusting estimates of causal effects for confounding due to covariates that may be correlated with the causal variable and the outcome variable; the approach has been used in several prior studies of job displacement (e.g., Brand 2004, 2006; Brand and Burgard 2008; Couch and Placzek 2010). We also study variation in maternal displacement effects, including heterogeneous displacement effects by the observed propensity for maternal displacement (Brand and Simon Thomas 2013; Xie, Brand, and Jann 2012), multistate displacement effects by contexts with more and less concentrated unemployment, and time-varying displacement effects by children's age when maternal displacement occurs (Brand and Xie 2007).

2 Background and Significance

In this section, we first review the literature on the effects of parental displacement on children's outcomes. We then describe the socioeconomic and employment conditions among single mothers, and how job displacement among single mothers may yield particularly deleterious consequences for children. Finally, we discuss potential sources of heterogeneity in the effects of displacement on children's outcomes.

2.1 Parental Job Displacement Effects on Children

As job displacement has substantial, long-term effects on workers' socioeconomic status, physical and psychological well-being, and social involvement, we reasonably expect these consequences to negatively affect children of displaced workers. A decrease in parental economic resources may restrict the ability to purchase goods critical for child development, such as schooling, housing, food, and cognitively enriched learning environments (Conger and Elder 1994; Duncan and Brooks-Gunn 1997; Kalil and Ziol-Guest 2008). The association between job loss and home loss via mortgage default and foreclosure, landlord foreclosure, or inability to pay rent, and reliance on public assistance suggest additional mechanisms by which parental displacement can affect the well-being of children (Antel 1992). Parental socioeconomic shocks and downward mobility can also dampen children's confidence in the value of education and work.

Moreover, to the extent that displaced parents model despondency and despair, they may foster psychological distress among children. McLoyd and Wilson (1990) note,

"deterioration in the parent's psychological functioning in the context of economic loss or poverty may become a communicable social phenomenon to the extent that the child imitates the symptomatic affect and behavior of the parent" (p. 53). Displaced parents' decreased psychological well-being can also inhibit emotional warmth and incite erratic or punitive parenting practices leading to poor adjustment in children (Conger, Conger, and Elder 1997; Conger and Elder 1994; Elder 1974, 1998; Elder, Nguyen, and Caspi 1985; Kessler, Turner, and House 1989; McLeod and Shanahan 1993; McLoyd 1990, 1998; McLoyd et al. 1994; McLoyd and Wilson 1990). Children are particularly vulnerable to maternal depression, with social-psychological and behavioral effects persisting through adulthood (Elder 1998; Meadows, McLanahan, and Brooks-Gunn 2007; Turney 2011). Although periods of unemployment potentially allow parents more time to spend with children, the stress associated with financial and employment uncertainty and the time needed to devote to job search instead seemingly reduce the quantity and quality of time spent with children (Brooks-Gunn and Markman 2005; Lareau 2003). As families lacking social capital and collective efficacy have children with lower educational and socioeconomic attainment, displaced parents' geographic mobility[1] and withdrawal from social life may negatively affect children's outcomes (Astone and McLanahan 1994; Coleman 1988, 1990; Furstenberg et al. 1999; Haveman, Wolfe, and Spaulding 1991; Leventhal and Brooks-Gunn 2000; McLanahan 1983; Sampson, Morenoff, and Earls 1999; Sandefur and Lauman 1998).[2]

Given the many reasons to expect a link between parental displacement and children's outcomes, and the current timeliness of studying the consequences of economic contractions, a literature is emerging on the effects of parental displacement on children. Most of this literature has focused on short-term educational and social-psychological outcomes, including lower self-esteem and higher likelihood of grade repetition, dropout, and suspension or expulsion from school (Johnson, Kalil, and Dunifon 2012; Kalil and Ziol-Guest 2005, 2008; Stevens and Schaller 2010).[3] Yet as displacement is associated with enduring outcomes for displaced workers themselves, it may likewise exert long-term effects on children. One study finds a significant negative effect on children's educational attainment at age 21 (Kalil and Wightman 2011); another study finds parental displacement is associated with lower income of children in adulthood (Page, Stevens, and Lindo 2009). Studies on parental displacement in Canada and Norway find negative effects on children's educational attainment and positive effects on social assistance in adulthood (Coelli 2010; Oreopoulos, Page, and Stevens 2008; Rege, Telle, and Votruba 2011). These studies, however, largely emphasize the deleterious effects of fathers' loss of financial standing in the family among married couple households. Those studies examining differences between paternal and maternal displacement effects among married couples find significant effects of paternal but not maternal displacement (Kalil and Ziol-Gest 2008; Rege, Telle, and Votruba

[1]It may be that the change in neighborhood characteristics typically associated with geographic mobility is the cause of declines in child well-being (Jackson and Mare 2009).

[2]Job displacement is also associated with divorce (Charles and Stephens 2004). However, as we focus on single mothers at the time of displacement in this paper, we do not review the links between displacement and divorce or between divorce and children's outcomes.

[3]Another strand of work shows that community-level job losses affect the achievement test scores of children, possibly the result of both direct effects on children whose parents lost jobs and indirect peer and teacher effects (Ananat, Gassman-Pines, and Gibson-Davis 2011).

2011); they generally hypothesize that maternal displacement is not as detrimental to children's outcomes as paternal due to greater psychological consequences associated with employment and income loss among fathers who are largely expected to maintain the role of primary provider. However, these studies do not explicitly examine the effects of displacement among single mothers.

2.2 Single Parenthood, Maternal Employment, and Children's Outcomes

The employment experiences of single mothers are important for a significant population of children in the U.S., as about half will spend a portion of their childhood raised by a single parent (Brown 2010; Ellwood and Jencks 2004; McLanahan and Percheski 2008), about 84 percent of custodial single parents are mothers, and about 80 percent of single mothers are employed (U.S. Census Bureau 2009). Single working mothers are more likely to be Black and Hispanic, be low income, have lower earnings and lower earnings potential, live in poverty, and endure job displacement and spells of unemployment relative to married working mothers (Attewell 1999; Brown 2010; Cancian and Meyer 2004; Edin and Kefalas 2005; Edin and Lein 1997a, 1997b; Ellwood and Jencks 2004; Harris 1993; McLanahan 2004, 2009; McLanahan and Percheski 2008). Children raised by single mothers have on average worse educational, socioeconomic, and social-psychological outcomes, ostensibly the result of economic deprivation, reliance on public assistance, psychological strain, inconsistent parenting style, low social control, and residence in disadvantaged communities (Amato 1987; Amato and Keith 1991; Astone and McLanahan 1994; Brown 2010; Crosnoe and Cavanagh 2010; Dornbusch et al. 1985; McLanahan 1985, 2004; McLanahan and Percheski 2008; McLanahan and Sandefur 1994; Pebley and Sastry 2004; Seltzer 1994).[4] Attention to the impact of labor market work among single mothers has increased, especially as welfare reform has meant that a larger proportion of single mothers are in the labor force and face even greater consequences to work interruption (Crosnoe and Cavanagh 2010; Danziger et al. 2002). Past research has focused on the constraints single mothers face to serving the dual role of nurturer and provider (Conger and Elder 1994; Edin and Lein 1997a, 1997b; Hao and Brinton 1997; Harknett 2006; McLoyd et a. 1994; Scott et al. 2001). This discourse and research on employment among single mothers largely treats labor force participation as a static and voluntary state. Yoshikawa, Weisner, and Lowe (2006) comment: "What is missing from this research literature on the effects of work on children? Astonishingly, almost none of the studies on maternal work and children's development examine the impact of changes in maternal work and its conditions on children" (p. 12).

There are, of course, noteworthy exceptions to this leaning, i.e. studies that have examined the relationship between employment trajectories, job instability, and children's outcomes among single-parent families (Chase-Lansdale et al. 2003; Hill et al. 2011; Kalil, Duniform, and Danziger 2001; Kalil and Ziol-Guest 2005; Stevens and Schaller 2011; Yoshikawa, Weisner, and Lowe 2006). Yet while this work captures the complexity of employment trajectories among single mothers, it does not generally differentiate between voluntary and involuntary job separation, and is thus faced with significant issues of selection bias. Several

[4]There is considerable family status complexity and instability within the "single" mother population, and thus heterogeneity in the social, and emotional support, as well as strain, mothers and children experience (Brown 2010; Yoshikawa, Weisner, and Lowe 2006). Nevertheless, variation in child well-being outside of two-parent married families is comparatively low (Brown 2010).

of these studies employ research designs to address concerns with selection, such as instrumental variables and quasi-experimental designs, but in so doing limit the generalizability of their findings to specific subpopulations. By contrast, displacement events are relatively exogenous to individual characteristics (i.e., relative to employment trajectories and voluntary job transitions). Stevens and Schaller (2010), for example, find little difference in the effects of parental displacement on children's outcomes using alternative estimation strategies, including fixed effects, leading them to assert that effects of displacement are not driven by unobserved heterogeneity. Indeed, several recent studies of parental job displacement have used the displacement event as a purer estimate of the effects of parental income shocks on children's outcomes (Page, Stevens, and Lindo 2009; Oreopoulos, Page, and Stevens 2008; Stevens and Schaller 2011).[5] In addition to reducing concerns over selection, estimating the effects of involuntary employment separations should be a focus of study for understanding the potential intergenerational consequences of the recent recession.

2.3 Variation in Parental Job Displacement Effects on Children

It is implausible to assume that children respond identically to parental displacement. We first hypothesize that displacement effects on children vary by parents' likelihood of displacement, which is influenced by worker characteristics and economic conditions. Displacement that occurs during recessions, in which many workers are laid off, is associated with greater economic losses than displacement that occurs during economic expansions (Couch, Jolly, and Placzek 2011; Davis and von Wachter 2011; Fallick 1996; von Wachter 2010). However, contexts of widespread unemployment lessen the internalization of blame and social stigma associated with job loss (Brand, Levy, and Gallo 2008; Charles and Stephens 2004; Clark 2003, 2010; Miller and Hoppe 1994). That is, displaced workers may benefit from a "social norm effect": as aggregate unemployment increases, one's own unemployment represents a smaller deviation from the social norm (Clark 2010), and thus displacement effects on social-psychological well-being are often less in contexts of mass layoffs. Likewise, while more disadvantaged workers, for whom displacement is more likely, may be more vulnerable to financial shocks, such economic adversity is a comparatively normative experience; by contrast, job displacement and socioeconomic decline may instigate an acute sense of deprivation among more advantaged families whose peers tend to be likewise advantaged and for whom displacement is a relative shock. Prior parental displacement research has examined variation in effects on socioeconomic attainment by worker characteristics, finding that effects are concentrated among disadvantaged families (Kalil and Wightman 2011; Oreopoulos, Page, and Stevens 2008; Stevens and Schaller 2011). However, this work does not consider how effects vary

[5]Although studying displacement reduces concerns over selection bias, we do not mean to say that we fully mitigate endogeneity issues. Employers may lay off workers they deem to be less productive, motivated, or committed to the job, or for a host of other idiosyncratic reasons. One additional strategy to deal with endogeneity concerns is to separate layoffs from plant closings, where the effects of plant closings provide a less biased estimate of displacement. However, we are not convinced this is the appropriate interpretation of such differences, and we do not employ this as a strategy to deal with selection in our main analyses. Job losses due to layoffs and those due to plant closings are also potentially different treatment conditions. Layoffs may produce larger effects due to lower post-displacement productivity signals (irrespective of actual worker characteristics) (Gibbons and Katz 1991), the loss of a job from larger, higher wage employment establishments (Krashinsky 2002), or from greater post-displacement internalization, stigmatization, and fewer similarly strained workers to offer a network of support (Brand, Levy, and Gallo 2008; Miller and Hoppe 1994).

within a sample of single parent households, effects on children's social-psychological well-being, or how effects vary by the likelihood of displacement.

We further hypothesize that child age when parental job displacement occurs interacts with the effects of displacement, an issue that has received little attention to date. As early childhood is important for cognitive, health, social, emotional development (Dahl and Lochner 2005; Duncan and Brooks-Gunn 1997; Duncan, Ziol-Guest, and Kalil 2010; Duncan et al. 1998; Shonkoff and Phillips 2000), it may be a period especially sensitive to parental displacement and associated economic adversity. Conversely, periods of unemployment allow mothers more time to spend with children, potentially deflating the deleterious effects of economic hardship among preschool-aged children. Moreover, young children are less subject to the social-psychological effects of relative socioeconomic status declines, whereas older children are more attuned to social stigma and relative status (Conger, Conger, and Elder 1997).[6] Economic adversity is also critical to adolescent well-being, for their extracurricular activities and social networks (Mistry et al. 2001) and in their educational decision making process.[7]

3 Data, Descriptive Statistics, and Methods

3.1 National Longitudinal Survey of Youth (NLSY) and National Longitudinal Survey's Child-Mother file (NLSCM)

We use data from the National Longitudinal Survey of Youth (NLSY) and the National Longitudinal Survey's Child-Mother file (NLSCM). The NLSY is a nationally representative sample of 12,686 respondents who were 14 to 22 years old when first surveyed in 1979; these individuals were interviewed annually through 1994 and biennially thereafter. In 1986, the National Longitudinal Survey began a separate survey of the children of NLSY women, the NLSCM. Data have been collected every two years since 1986, with new sections added in 1994 as children entered young adulthood. As of 2010, the 6,283 NLSY women had given birth to about 11,500 children. The NLSY is an underutilized resource for the study of job displacement (Kletzer and Fairlie 2003). In addition to extensive information on individual characteristics, NLSY data allow distinction between layoffs and firings, which stands in contrast to many surveys used to study displacement.[8] It also has a short recall period for reporting job losses for a panel survey, from one (in 1984–1994) to two (in 1996–2010) years, an important component for retrospective reports of unemployment (Duncan and Mathiowetz 1988).

We define displacement as termination from the mother's main job between each interview period as a result of layoff or plant closing; in other words, we consider mothers who quit jobs or were fired as non-displaced.[9] As the NLSY grouped layoffs with temporary job

cioeconomic outcomes, and negative effects if employment is marked by poor working conditions, but positive effects of maternal employment when children are adolescents [see Crosnoe and Cavanagh (2010) for a review].

[7]In our analyses, we focus on variation in effects by the treatment condition rather than by the sample condition. Another potentially interesting hypothesis is that maternal displacement effects within a "single" mother population vary by family composition, e.g., by partnership status, characteristics of partners, or marital status at the time of birth. We explore several such models in results not shown, and do not find systematic differences; however, in future work we continue to explore these questions.

[8]Measurement error is nonetheless possible if respondents report they were laid off when they were in fact fired, a problem common to all survey data attempting to make this distinction.

endings prior to 1984, we do not use pre-1984 data on displacement. These years also correspond to early labor market activity, marked by job churning, and are not the primary focus of most displacement studies. We merge data on women from the NLSY to data on children from the NLSCM (n=4,931 mothers and n=11,504 children, where children become our unit of analysis) and reconstruct displacement indicators from year (1984–2010) to child age (0–17). We restrict our sample to children whose mothers were not continuously married and living with a spouse between 1984 and 2010 and for whom we have data on mothers' job separation (n=3,109 mothers and n=6,751 children), and to children who were at least 19 years old in 2010 (n=2,834 mothers and n=5,697 children), as all our outcomes pertain to children who are at least 19 years old. Single motherhood is not a static state. Displaced mothers were single when they were displaced, as were non-displaced mothers at some period during their children's childhood, but not necessarily continuously single. Our primary indicator of displacement captures maternal job loss that occurs anytime during childhood (age 0–17). Alternative displacement indicators are described below.

Covariates used to estimate the propensity for maternal displacement are described in Table 1. Most of theses measures are straightforward. In 1980, 94 percent of NLSY respondents (the mothers) were administered the ASVAB, a battery of ten intelligence tests measuring knowledge and skill in areas such as mathematics and language. We first residualize each of the ASVAB tests on age at the time of the test separately by race and ethnicity. Residuals were standardized to mean zero and variance one. We construct a scale of the standardized residuals (α = .92) with mean zero, standard deviation 0.8, and range of −3 to 3. We incorporate two measures of personality characteristics (or "non-cognitive" skills). First, we include the "Rotter Locus of Control Scale" collected in 1979, designed to measure the extent to which individuals believe they have control over their lives through self-motivation or self-determination (internal control) as opposed to the extent that the environment (chance, fate, luck) controls their lives (external control). The scale ranges from 4 to 16, where lower values indicate greater internal control. Although the internal consistency of the scale is low for the NLSY cohort (α = .36), the scale correlates well with self-esteem, education, and social class. Second, we construct a measure of delinquent activity based on sixteen questions collected in 1980 asking whether or not the respondent engaged in activity such as stealing, gambling, fighting, or doing drugs. We use several additional time-varying pre-displacement characteristics of mothers: number of children, married or partnered,[10] years of education, region of residence (Northeast and North Central or South and West), employer tenure (measured in weeks), and whether or not mothers were manufacturing or trade workers. For the full sample, covariates are measured at children's birth (i.e., pre-displacement interval), but we also construct each of these time-varying measures for children at ages 6 and 12, i.e., as baseline measures for each time-varying displacement interval.

[9]We restrict displacement to the CPS job, or the main job respondents held in each spell. Our restriction, like that employed in definitions of displacement by the Bureau of Labor Statistics, is motivated to establish worker attachment to jobs lost and not to categorize multiple overlapping jobs lost as displacements.

[10]Although women are single when they are displaced, they may have different relationship statuses throughout the course of their child's lives, and we therefore include married or partnered status as a baseline covariate.

In order to assess the impact of maternal displacement during childhood on both educational attainment and social-psychological well-being of young adults, we explore five outcomes: high school completion by age 19, college attendance by age 21, college completion by age 25, and depressive symptoms at ages 20–24 and 25–29. Depressive symptoms in young adulthood were collected in 1994–2010 and measured with a 7-item Center for Epidemiological Studies Depression Scale (CESD) (Radloff 1977) that asked respondents whether they never/rarely, sometimes, occasionally, or most/all of the time: (1) had poor appetite; (2) had trouble keeping their mind on tasks; (3) were depressed; (4) felt that everything took extra effort; (5) had restless sleep; (6) were sad; and (7) could not get going. We perform factor analyses for each set of items in 1994 through 2010 and find that the 7 items load onto a single factor in each year. We create scales for each year that range from zero to one; alphas range from 0.66–0.74. We then construct two measures that correspond to children age 20–24 and 25–29, where we use the most recent assessment for children older than the lower bound age.

3.2 Estimating Maternal Displacement Effects

For unit *i*, the effect of maternal displacement is defined as the difference between the two potential outcomes in the treated and untreated states (*d=1,0*) (Morgan and Winship 2007; Heckman 2005; Imbens 2004; Rubin 1974):

$$\delta_i = y_i^{d=1} - y_i^{d=0}. \quad (1)$$

That is, we ask whether children whose mothers were displaced from jobs have different outcomes than they otherwise would have had if their mothers had not been displaced. While less governed by selection than voluntary job separation, displacement is nonetheless conditioned by maternal characteristics that are also associated with levels of subsequent child outcomes. If unobserved maternal characteristics affect decisions to work at firms that are prone to instability and these characteristics are also correlated with parenting and outcomes of children, the effects of maternal displacement on children will be biased. Or, if firms make idiosyncratic layoff decisions, it may be that relatively less productive workers (e.g., workers with lower levels of motivation and ability) are also parents of children who have worse outcomes. The key to our identification strategy is the assumption that displacement is an exogenous event that is not correlated with such unobserved factors that could affect children's outcomes. Although we condition on a rich set of observed characteristics, including factors like cognitive ability and personality characteristics, we can never be sure that this assumption is fully satisfied.

We report a series of estimates of maternal displacement, beginning with simple bivariate associations, or unmatched mean differences, to provide a baseline estimate of differences in outcomes between children whose mothers were and were not displaced. We then report kernel matching estimates where children whose mothers were and were not displaced are matched according to their propensity for maternal displacement (Rosenbaum and Rubin 1983, 1984; Rubin 1997). We estimate the propensity score with a logit regression of the following form:

$$P_i=p(d_i=1|X)=\log\frac{d_i}{1-d_i}=(\sum_{k=0}^{K}\beta_k X_{ik}). \quad (2)$$

Differences between the unmatched and matched estimates suggest selection into displacement by observed covariates. We then examine both the average treatment effect on the treated (*TT*)

$$E(\delta|d=1,P)=E(y^{d=1}-y^{d=0}|d=1,P), \quad (3)$$

and the average treatment effect on the untreated (*TUT*)

$$E(\delta|d=0,P)=E(y^{d=1}-y^{d=0}|d=0,P). \quad (4)$$

Differences between the *TT* and *TUT* suggest heterogeneity in treatment effects, an issue with substantive significance to which we return below. Appendix A provides more details regarding our matching estimators.[11],[12]

3.3 Estimating Variation in Maternal Displacement Effects

3.3.1 Heterogeneous Treatment Effects—We first consider variation in effects of maternal displacement on children by the observed likelihood of having a mother who is displaced from a job based upon a range of maternal characteristics. Our stratification-multilevel (SM) method to estimate heterogeneous treatment effects (Jann, Brand, and Xie 2010; Xie, Brand, and Jann 2012) involves the following steps: (1) Estimate propensity scores for each child for the probability of maternal displacement given a set of observed covariates [$P(d=1|X)$]; (2) Construct balanced propensity score strata such that there are no significant differences in the average values of covariates and the propensity scores between the children whose mothers were and were not displaced; (3) Estimate propensity score stratum-specific maternal displacement effects (level-1 effect estimates); and (4) Evaluate trends across strata using variance-weighted least squares regressions of the strata-specific displacement effects obtained in step (3) on strata rank (level-2 effect estimates). We estimate our level-2 model by:

$$\delta_s=\hat{\delta}_1+\gamma S+\varepsilon_s, \quad (5)$$

where level-1 slopes (δs) are regressed on propensity score rank indexed by *S*, δ_{-1} represents the level-2 intercept (i.e., the predicted value of the effect of maternal displacement for the lowest propensity stratum), and γ represents the level-2 slope (i.e., the

[11]There are at least two advantages to using matching over conventional regression models. First, in contrast to regression, we make no functional form assumption for the relationship between the covariates and outcomes using matching. Second, covariate imbalance (also called “common support”) is a focal concern in matching routines, while imbalance between treated and untreated cases goes undetected all too often in regression analyses.

[12]We do not use fixed effects models because the young adult outcomes we explore are not repeated before and after the displacement interval. We do not use sibling fixed effects models because the siblings share the treatment condition (i.e., siblings jointly experience maternal displacement, at least over their childhood). But even had siblings not shared the treatment, we question whether the fixed family effect in such a study would induce an endogenous selection bias.

change in the effect of maternal displacement on children's outcomes with each one unit change to a higher propensity score stratum). Our objective is to look for a systematic pattern of treatment effects across strata. The assumption is that we consider all units within strata, treated and untreated, as homogeneous for estimating treatment effects. Although the assumption of within-stratum homogeneity is unlikely to be true, it is less stringent than the full sample homogeneity assumption. This method has been used in empirical research on the effects of education (Brand 2010; Brand and Davis 2011; Brand and Xie 2010; Musick, Brand, and Davis 2012) and market processes in China (Xie and Wu 2005), but not for the effects of job transitions.

We also test sensitivity to the parametric and strata-specific homogeneity assumptions imposed in SM using a newly developed matching-smoothing method of estimating heterogeneous treatment effects (MS; Xie, Brand, and Jann 2012) which involves the following steps: (1) Estimate propensity scores for each unit; (2) Match treated units to untreated units with a matching algorithm; (3) Plot the observed differences between treated and untreated units against a continuous representation of the propensity score; and (4) Use a nonparametric model (local polynomial with degree 1 and bandwidth 0.1) to smooth the variation in matched differences to obtain the pattern of treatment effect heterogeneity as a function of the propensity score.

3.3.2 Multistate Treatment Effects—Second, we study variation in effects of maternal displacement on children's outcomes by considering multistate treatment conditions, where we separate displacement that occurred in contexts of more or less concentrated unemployment. That is, we examine separately the effects for children whose mothers were displaced during recessionary (i.e., 1990–1992, 2001–2002, 2008–2010) and non-recessionary periods (i.e., 1984–1989, 1993–2000, 2003–2007). Additionally, using private geocode data from the NLSY, we separate children whose mothers were displaced in labor market areas (LMAs) (i.e., metropolitan or micropolitan areas or the computed balance of the state unemployment rate) with high and "non-high" unemployment, where high unemployment is defined as at least 9 percent unemployed.[13] The untreated groups in both cases include children whose mothers were not displaced. Use of alternative indicators also provides a measure of robustness to results suggesting that context impacts maternal displacement effects on children. Both of these multistate indicators test the degree to which maternal displacement effects on child well-being are more sensitive to economic adversity, generally greater in high unemployment contexts, or social stigma and relative deprivation [i.e., the evaluation of relative standing vis-à-vis reference peers (Davis 1959; Merton and Kitt 1950)], generally greater in lower unemployment contexts. However, the macroeconomic context may involve less social salience for individual experiences than the regional context if reference comparisons are situated at more proximate levels of aggregation (Clark 2003).

3.3.3 Time-Varying Treatment Effects—Third, to study variation in effects of maternal displacement by children's age when displacement occurs, we construct three age-specific

[13]Results are robust to alternative thresholds (i.e., 8 and 10 percent) for defining high unemployment.

displacement intervals: 0–5 (early childhood years), 6–11 (middle childhood years), and 12–17 (adolescent years). Within each interval, displaced mothers must be single at the time of the event and non-displaced mothers must have been single at some point during the interval; both displaced and non-displaced mothers could be married at other times. To address the counterfactual complexity involved in studying time-varying treatments, we adopt the conceptual framework of Brand and Xie (2007). Simplifying by restricting to non-repeatable events, in this case initial maternal displacement, treatment can occur in period $d=t$, where $t=\{$age 0–5, 6–11, 12–17$\}$. Analogous to an event history set-up, children at risk for experiencing maternal displacement at time interval t have not experienced the event up to the baseline of t. The reference children include all those who have not experienced a maternal displacement up through time t and those who do and do not experience maternal displacement at any time subsequent to t. We thus remain agnostic about future events, treating future paths as unknown to us as they are to the individuals living them.[14] Figure 1 is a flowchart depicting our framework for estimating time-varying maternal displacement effects. We begin with all children, and those children's mothers can either be displaced when children are 0–5 or not displaced; those whose mothers are non-displaced by age 5 can either have mothers displaced at 6–11 or not displaced; those whose mothers are non-displaced by age 11 can either have mothers displaced at 12–17 or not displaced. Each transition is associated with a marginal probability weight $p()$ of being treated or $q()$ of not being treated in period t. We define the treatment effect at t on an outcome measured at T as:

$$\delta_i^{t^*} = y_i^{d=t} - y_i^{*d>t}, \quad (6)$$

where $y_i^{d=t}$ is the value of the outcome for children whose mothers were displaced in period $d = t$ and $y_i^{*d>t}$ is the value of the outcome for the same unit had that unit not been treated up until t. We define $y_i^{*d>t}$ as:

$$y_i^{*d>t} = \sum_{h=1}^{T} w_{ih} y_i^{d=h} + w_{T+} y_i^{d>t}, \quad (7)$$

where w's are weights, we denote children whose mothers were not displaced in any of the observed periods by $d > T$, and we apply the following normalization constraint:

$$\sum_{h=1}^{T} w_{ih} + w_{T+} = 1. \quad (8)$$

We match children by the time-invariant covariates and time-varying covariates that correspond to child age prior to each treatment interval (i.e., age 0, 6, and 12).

[14]For example, consider a child whose mother lost her job when the child was 8 years old, i.e. during the age interval 6–11. The reference child is one whose mother had not lost a job up though age 11, but whose mother may or may not have lost a job when the child was age 12–17.

4 Results

4.1 Descriptive Statistics

Table 1 describes covariates used to predict maternal displacement and children's outcomes.[15] Displaced mothers are more disadvantaged than non-displaced mothers on most indicators: they have more disadvantaged family backgrounds, have lower measured ability and fewer years of education, are more likely to have engaged in delinquent activity, have more children, less employer tenure, and are more likely to be in manufacturing and trade industries. We also report descriptive statistics for our five outcomes. Children whose mothers were displaced have lower educational attainment and higher levels of depressive symptoms than children whose mothers were not displaced.

4.2 Effects of Maternal Displacement on Children's Outcomes

We first derived estimated propensity scores for maternal displacement for children age 0–17 using the set of pre-displacement covariates. Logistic regression results reported in Table 2 suggest that black mothers are significantly more likely to be displaced than white mothers, as are mothers with low measured ability, mothers who have engaged in delinquent activity, and mothers who do not attend college. Employer tenure is protective as is working in a non-manufacturing and non-trade industry. Our propensity equation does not have strong predictive ability, as expected given the relatively exogenous shock of a displacement event (Brand 2004).[16] Table 2 reports only one of the nine propensity score models we run, given that we also estimate multistate and time-varying displacement effects. The alternative propensity model estimates are available upon request.

We report unmatched differences and two sets of propensity score matching estimates of maternal displacement on children's outcomes in young adulthood in Table 3. Results pertain to maternal displacement that occurs anytime when the child is age 0–17.[17] The unmatched differences establish a benchmark to compare to matched results. All effect estimates are statistically significant. Children whose mothers were displaced have a 5 percentage point lower level of high school and of college completion (or a 22 and 41 percent decrease in the expected odds, respectively), and a 9 percentage point lower level of college attendance (or a 32 percent decrease in the expected odds) than children whose mothers were not displaced. Our measure of CESD ranges from 0 to 1, with an overall mean of about 0.23 for both 20–24 and 25–29 year olds. Children whose mothers were displaced have a 0.02 increase in depressive symptoms at age 20–24 and a 0.03 increase at age 25–29 relative to children whose mothers were not displaced.

We next turn to kernel matching results.[18,19] We report both treatment effects for the treated (*TT*) (i.e., effects pertaining to children whose mothers were displaced) and treatment

[15]We impute missing values using the full set of covariates for all variables with at least 1 percent missing. Mothers' mothers' education (i.e., children's grandmothers), mothers' delinquency, and mothers' ability had the most missing values (7.6, 6.6, and 4.8 percent, respectively). The remaining missing propensity score values (2.8 percent, n=158) were imputed using the results of successive propensity score models for each year of the survey.

[16]Alternatively, we are missing covariates that would enable stronger prediction of maternal displacement events.

[17]In results not shown, we stratified analyses by child's gender and found that effect estimates do not significantly differ. We also ran regression models where we cluster on mothers to account for the dependence among siblings; substantive findings were not affected by this adjustment.

effects for the untreated (*TUT*) (i.e., effects pertaining to children whose mothers were not displaced, had they been displaced) to provide preliminary evidence as to variation in effects by the propensity for treatment. For the *TT*, although point estimates of maternal displacement effects are lower than unmatched differences, displacement remains associated with lower levels of high school completion and college attendance and completion (a 4, 6, and 4 percentage point difference, or a 15, 24, and 33 percent decrease in the expected odds, respectively), and higher levels of depressive symptoms in the late 20s. The estimates of the *TUT* are larger than those for the *TT* for all five outcomes, including a 22, 35, and 35 percent decrease in the odds of high school completion, college attendance, and completion, respectively, and larger increases in depressive symptoms. As the distribution of the untreated population is weighted toward lower propensity individuals, *TUT* > *TT* suggests that effects of maternal displacement on children's educational attainment and psychological well-being in young adulthood are larger for children whose mothers are unlikely to experience a displacement event.

4.3 Variation in Effects of Maternal Displacement on Children's Outcomes

4.3.1 Heterogeneous Maternal Displacement Effects—Average effects of maternal displacement on children's outcomes may conceal underlying systematic effect heterogeneity (i.e., variation in effects by selection into treatment) shaped by the population composition of children of displaced mothers (Brand and Simon Thomas 2013; Xie, Brand, and Jann 2012). To assess effect heterogeneity we use the stratification-multilevel method (SM), in which we generate balanced propensity score strata, estimate effects by strata (level-1), and then estimate the trends in effects (level-2). In contrast to comparing differences between *TT* and *TUT* matching estimates, we explicitly estimate effects across the propensity score distribution and assess the trend in effects using the SM approach. Our analysis resulted in five strata by which the sample is divided, where stratum 1 corresponds to the lowest propensity and stratum 5 to the highest propensity children (based on their mothers' probability of displacement).[20] As we observe from the strata-specific population composition of children and their displaced mothers reported in Appendix B, young black mothers with low measured ability who are high school dropouts, engaged in delinquent activity, who grew up in the south, work in manufacturing, and have only a few months job tenure are characteristic of mothers with a high propensity for displacement. By contrast, relatively older white mothers with higher measured ability who attend college, work outside manufacturing, and have at least a year of job tenure are characteristic of mothers with a low propensity for displacement.

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[18]We also estimate *t*-tests for equality of means between treated and control groups, the standardized bias before and after matching, and the achieved percentage reduction in bias. The standardized bias is the difference in means in the treated and non-treated (full or matched) subsamples as a percentage of the square root of the average of the sample variances in the treated and control groups (Rosenbaum and Rubin 1985). We achieve substantial reduction in bias via matching (results available upon request).

[19]Morgan and Winship (2007) find that kernel matching (Leuven and Sianesi 2003) performs best (has least bias) with a well-specified propensity score equation, but that matching with 5 nearest neighbors (Abadie et al 2004; Herr et al. 2004) performs best with a poorly specified propensity score equation. In results not shown, we compare kernel matching estimates to matching with five nearest neighbors as a sensitivity test for misspecification. Results are substantively similar.

[20]Even the highest propensity score stratum has a lower bound propensity score of 0.2 on a range of 0 to 1, due to the limited predictive ability of our propensity score equation.

Results reported in Table 4 suggest declines in the deleterious effects of maternal displacement as the propensity for displacement increases. That is, examining the trend in treatment effects (i.e., the level-2 slopes) we find that children with the most advantaged mothers who have the lowest propensity for displacement have the largest negative effects of maternal displacement on high school completion and college attendance and the largest positive effects on depressive symptoms outcomes in young adulthood. We find, however, no trend in effects for college completion. We observe several significant level-1 slopes among low propensity children in stratum 1, generally larger than the average effects we report in Table 3, one marginally significant effect in stratum 2, and no significant effects among higher propensity children in strata 3–5. Figure 2a and 2b summarize the results from Table 4. The *x*-axes indicate propensity score strata and *y*-axes the displacement effects, where "points" represent level-1 and lines represent level-2 slopes. Results from Table 4 and Figure 2 provide further support for the matching results in Table 3 suggesting $TUT > TT$, as both indicate that children with a low propensity for maternal displacement are most negatively impacted by the event.

As we do not observe a clear monotonic trend in effects, we test the sensitivity of our analyses to the parametric assumption we impose in SM using the matching-smoothing heterogeneous treatment effects method (MS). Figures 3a and 3b depict local polynomial smoothed curves fit to kernel-matched differences between children whose mothers were and were not displaced by estimated propensity scores. The *x*-axes indicate estimated propensity for maternal displacement and *y*-axes the matched differences between treated and controls. The scatterplots are omitted for simplicity. Confirming our results from SM, we observe the negative effect of maternal displacement on high school completion and college attendance and the positive effect on depressive symptoms decrease as the propensity for displacement increases. The effects on college completion have an approximate U-shape, indicating the largest effect for children whose mothers have a mid-propensity for displacement.[21]

We do not mean to suggest that children with mothers who have a high propensity of displacement are more advantaged in their levels of educational attainment and psychological well-being, as they nevertheless face a variety of disadvantaged circumstances through childhood; they are, nonetheless, less impacted by maternal displacement compared to lower propensity children. To underscore this point, we report levels of children's outcomes by maternal displacement and strata in Appendix B.

4.3.2 Multistate Maternal Displacement Effects—In Table 5, we report estimates of multistate maternal displacement effects on children's outcomes in young adulthood. We compare effects for children whose mothers were displaced during recessionary and non-recessionary periods (to assess differences in macroeconomic contexts) and effects for children whose mothers were displaced in labor market areas with at least 9 percent unemployment to areas with less than 9 percent unemployment (to assess differences in

[21]To facilitate implementation of our analyses of heterogeneous treatment effects, we use the Stata modules -hte- for SM (Jann, Brand, and Xie 2010) and -hte2- for MS. We thank Ben Jann for programming modifications to hte2 to facilitate presentation of our results.

local contexts). We also compare the *TT* to the *TUT* within each treatment condition. For the *TT*, we find a significant 8 percentage point lower level of high school completion and a 6 percentage point lower level of college completion (or a 29 and 49 percent decrease in the expected odds, respectively) for children whose mothers were displaced during recessions. The *TUT* estimate is larger for high school completion than the *TT* estimate, and significant for college attendance, but smaller for college completion. We find no significant effects on depressive symptoms for children whose mothers were displaced during recessions. For children whose mothers were displaced in non-recessionary periods, with one exception for the *TT* estimate for high school completion, effects estimates are significant for all outcomes. Point estimates are somewhat smaller for high school and college completion but larger for college attendance, suggesting a 7 and 11 percentage point lower level of college attendance for the *TT* and the *TUT* respectively. We find significant effects on depressive symptoms throughout the 20s, with larger effects in the late than the early 20s, and larger effects for the *TUT* than the *TT*.

Results for children whose mothers were displaced in labor market areas with high and non-high unemployment are similar to those for recessionary and non-recessionary displacements. That is, only high school completion and college attendance (for the *TUT*) are significant among children whose mothers were displaced in high unemployment areas, whereas all outcomes (except high school completion for the *TT*) are significant for children whose mothers were displaced in areas without high levels of unemployment. Point estimates are likewise similar across the two sets of results. Yet it is not the case that these are the same children across these treatment conditions (see Appendix C). Mothers displaced in high unemployment areas are more disadvantaged relative to mothers displaced in recessionary periods. Moreover, low propensity mothers differ from mothers displaced in low unemployment contexts (where in both cases, we find the largest effects of displacement): family backgrounds and employment profiles substantially differ, with low propensity mothers more advantaged. These groups share in common, however, that the displacement event should be a greater shock and potentially incite a greater sense of relative deprivation relative to high propensity displaced mothers and mothers displaced in high unemployment contexts, where economic adversity deviates less from the social norm.

4.3.1 Time-Varying Maternal Displacement Effects—We report *TT* and *TUT* kernel matching estimates of time-varying effects of maternal displacement in Table 6. For the first column labeled “mother displaced child age 0–5,” we matched by propensity scores estimated with a logit regression of maternal displacement when children are 0–5 on the time-invariant predictors and those predictors corresponding to children at age 0. In the second column labeled “mother displaced child age 6–11,” we used the same time-invariant predictors and predictors corresponding to children at age 6 to construct propensity scores. And for “mother displaced child age 12–17,” we used the time-invariant predictors and predictors corresponding to children at age 12. As we describe above, children whose mothers were displaced in prior periods are no longer at risk for initial maternal displacement and were dropped from subsequent comparisons.[22]

We find only one marginally significant estimate of maternal displacement occurring in early childhood (*TUT* for college attendance).[23] By contrast, we find significant deleterious

effects of maternal displacement occurring in middle childhood on college attendance (a 30 decrease in the expected odds) and psychological well-being in the late 20s (in both cases the *TUT* is modestly larger than the *TT*). For children whose mothers were displaced when they were adolescents, we find large significant *TT* effects on every outcome. The *TUT* point estimates are all greater than the *TT* for adolescents whose mothers were displaced, but effects on college completion and depressive symptoms in the late 20s are not significant. For the *TT*, we observe a 12 percentage point lower level of high school completion, a 10 percentage point lower level of college attendance, and a 5 percentage point lower level of college completion (a 40, 25, and 45 percent decrease in the expected odds, respectively). We find large effects of displacement on depressive symptoms in the 20s among children whose mothers were displaced in adolescence, but effects in the late 20s are larger among children whose mothers were displaced in middle childhood.

4.3.4 Descriptive Statistics of Family and Socioeconomic Statuses of the Displaced—Table 7 reports descriptive statistics of family and socioeconomic statuses pre- and post-maternal displacement and throughout childhood for our full sample of children whose mothers were displaced and each subpopulation defined by displacement propensity, context, and timing. Panel A describes family structure heterogeneity over the course of childhood for the population of children whose "single" mothers were displaced. The average child of a displaced mother spends 18 percent of childhood with married parents. Children of displaced mothers have on average two maternal relationship transitions (between marriage or partnership states). We observe little difference in marital or partnership statuses, or the number of relationship transitions, among mothers across displacement contexts. We find higher post-displacement marriage levels, but not partnership levels or relationship transitions, among mothers who were displaced when children were young relative to mothers who were displaced when children were older. The most notable differences lie across displacement propensity. Children whose mothers have a higher likelihood of displacement spend less time with married or partnered parents and have more relationship transitions. Low propensity children are therefore more likely to have another resident adult present, but nevertheless have larger effects of maternal displacement on attainment and well-being.

In Panel B, we describe unemployment, wages (among employed workers), and "welfare" receipt (including welfare, food stamps, or other public assistance). Post-displacement unemployment is uniformly high across displaced subpopulations, but particularly for those displaced in high unemployment contexts. Wages significantly decline following a displacement, but generally resume pre-displacement levels 2–4 years post. Mothers

[22]Our time-varying treatments were constructed such that adolescents whose mothers experienced displacement were preceded by a decade or more in which no job loss occurred, while young children whose mothers experienced displacement may have been preceded by frequent losses. In results not shown, we estimated two additional series of matching models to test the sensitivity of our results to this specification. First, we estimated time-varying maternal displacement effects where we eliminated children whose mothers experienced multiple displacements (47 cases for children age 0–5, 63 cases for children age 6–11, and 15 cases for children age 12–17). Second, we estimated time-varying effects where we relaxed our preferred event history set-up, and allowed the control units to include children whose mothers were displaced at earlier periods (resulting in no change to the sample of children age 0–5, but adding 23 cases to children age 6–11 and 53 cases to children age 12–17). Both specifications yield results that are substantively similar to our original time-varying specification.

[23]Young children have a longer period between the displacement event and the outcome than older children whose mothers were displaced. It is unclear, however, whether maternal displacement effects would diminish or accumulate over this period.

displaced in recessions have larger wage declines than mothers displaced in expansions, but we find little difference between mothers displaced in high relative to non-high unemployment areas. Mothers displaced when children are adolescents have higher pre-displacement wages (as these mothers tend to be older) and have greater wage declines post-displacement than mothers displaced when children are younger. As expected, mothers' pre-displacement wages decrease and levels of welfare increase as the propensity for displacement increases. Wages in the period immediately following displacement are roughly equalized across the propensity for displacement, but return to their pre-displacement pattern 2–4 years post. We thus observe a potentially larger short-term economic impact, but less overall economic adversity, among low propensity mothers.

5 Conclusions

The study of parental job displacement effects on children augments an extensive literature on the relationship between family socioeconomic status and children's life outcomes by relating career shocks, economic restructuring, and structural labor market conditions to parental attainment and the intergenerational transmission of status. Job displacement is a precipitating life event that entails a sequence of stressful experiences, from job loss notification, anticipation, dismissal, and unemployment, to job search, possible retraining, and eventual reemployment, often in a job of inferior quality and lower earnings relative to the job lost. Displacement is the result of conditions that are largely beyond the control of parents, nonetheless hindering parents' ability to sustain a career characterized by upward mobility and to transmit accrued advantages to children. By studying displacement and its effects on intergenerational mobility, we capitalize on a scientific opportunity provided by extreme economic change. Abrupt changes in economic conditions provide a stronger basis for the study of socioeconomic transmission than the usual practice of examining the covariation of outcomes with socioeconomic status that arise from a variety of sources over an indeterminate period.

Despite this motivation for studying displacement and the large literature linking displacement to deleterious worker outcomes, we know relatively less about how displacement among parents, particularly single parents, affects children. The possibility that children will endure adverse socioeconomic consequences and model psychological distress resulting from displacement is heightened in single-parent families because such children generally lack the advantage of an additional parent or parental figure who may either be employed or possibly temper a depressive outlook with a more optimistic and positive style of coping. As past research on displacement is largely silent as to intergenerational effects among single parents, so too past research on single parents is fairly limited as to the consequences of involuntary employment separations. Much of this latter work treats employment status as a static state, and those studies attending to employment trajectories among single parents treat some combination of voluntary and involuntary transitions as employment instability, thereby limiting causal inference.

In this study, we expand and integrate past research by examining how job displacement among single mothers divides children's educational and social-psychological outcomes in young adulthood. We use data on women from the National Longitudinal Survey of Youth

1979 (NLSY) who were followed for the last three decades, and on their children from the National Longitudinal Survey's Child-Mother File (NLSCM) who have been followed for over two decades. The NLSY and NLSCM are well suited for studying intergenerational effects of maternal displacement. They contain rich panel data on the social background, education, and labor market experiences of women and their children. In contrast to most panel data, the NLSY does not group workers who lost jobs due to layoffs with workers who were fired; consequently, selection bias poses less of an obstacle to estimating effects of involuntary employment separation. Estimating the propensity for maternal displacement with a range of maternal characteristics, we find that mothers with disadvantaged socioeconomic backgrounds, with low achievement and ability, engaged in delinquent activity, and with low adult socioeconomic status are most likely to be displaced from jobs, and consequently face an additional hardship while raising their children. Using propensity score kernel matching, we find significant deleterious effects of maternal displacement on children's high school completion, college attendance and completion, and depressive symptoms as young adults. These lower levels of educational attainment and social-psychological well-being render children of displaced mothers more likely to experience job displacement over the course of their own careers, signifying a potential intergenerational transmission of employment instability.

We also explore variation in the effects of displacement by the likelihood a child's mother lost her job, by loss occurring in contexts with more or less unemployment, and by the child's age at which a mother lost her job (i.e., by displacement propensity, context, and timing, respectively). As to variation in effects by displacement propensity and context, one possibility is that income shocks are more damaging to children of families with a high likelihood of displacement and those who experience the event in high unemployment contexts, i.e. situations in which economic adversity tends to be greater (Couch, Jolly, and Placzek 2011; Davis and von Wachter 2011; von Wachter 2010). But this conjecture is largely unsupported by our analyses of the effects of maternal displacement on children, particularly for effects on children's social-psychological well-being. Our results instead suggest that maternal displacement among children whose mothers had a low likelihood of displacement and children whose mothers were displaced in low unemployment contexts yield the largest effects. Prior research found larger effects on workers' social-psychological distress in contexts without widespread unemployment, as such settings heighten the internalization of blame and social stigma associated with job loss (Brand, Levy, and Gallo 2008; Charles and Stephens 2004; Clark 2003, 2010; Miller and Hoppe 1994); but these studies have not considered effects on children. Yet another strand of research demonstrates that social stigma and relative deprivation are primary factors linking socioeconomic shocks to child well-being (Duncan and Brooks-Gunn 1997; MacLeod and Shanahan 1993). Thus, although economic adversity is generally less for children of low propensity mothers and those displaced in lower unemployment contexts, such families lack referents to similarly strained families and a social norm of deprivation. Mothers who have a high likelihood of displacement, by contrast, may expect more socioeconomic instability in their lives and be embedded in a social network in which income shocks and economic distress are normative experiences and less stigmatized as a result of individual failure, rendering the effects of displacement on their children less severe.

As to variation in displacement effects by timing, despite developmental theory suggesting critical consequences of socioeconomic adversity in early childhood, we find no negative effects among young children whose mothers were displaced. We find, however, significant effects when maternal displacement occurs in middle childhood and, especially, adolescence. To the extent that older children are more sensitive to experiences of social stigma and relative deprivation than younger children, these findings may likewise suggest the importance of these social-psychological mechanisms in the impact of family socioeconomic shocks on child well-being. There are a few alternative, or additional, explanations for variation in effects by displacement timing. The positive effects of mothers home to tend to their young children may counterbalance the negative effects and economic pressures associated with job loss. Or the lengthy time elapsing between maternal displacement in early childhood and young adult outcomes may dilute, rather than strengthen, initial effects (at least for educational attainment). Or adolescents may enter the labor market when mothers lose jobs to partially offset family economic distress, and thus be less likely to continue their education.

We caution that results such as ours are always subject to the possibility that some important omitted variables differentiate children whose mothers were and were not displaced. Indeed, an alternative interpretation for heterogeneity in effects involves differential selection bias. That is, women with a low propensity for job displacement and women displaced in relatively low unemployment settings may have more unobservable characteristics that bias the relationship between maternal displacement and children's outcomes. We cannot adjudicate between this possibility and the explanations we offer above, but we speculate that both play a role. Our study is also limited in that we do little to attend to the heterogeneity of the "single mother" population. Future work will explore the complex interrelationship between family structure, parental displacement, and child well-being. Moreover, we do not distinguish different recessionary periods. As data become available, future work should focus more explicitly on the effects of parental displacement occurring during the Great Recession on children's long-term outcomes. Finally, we do not explicitly assess potential mechanisms linking maternal displacement to children's outcomes. Our approach focuses on first determining that main effects exist, an issue that, as demonstrated throughout these analyses, is sufficiently complicated and important as to warrant undivided attention. The effects of mediators on later outcomes, often estimated by simply including such variables in expanded regression models, seldom warrant causal interpretations and can lead to erroneous conclusions regarding both the intermediary and main effects (Elwert and Winship 2013; Holland 1988; Sobel 2008). Future work should attend to the causal effects of the mechanisms linking parental displacement to children's well-being.

As at least half of all children will spend some portion of their childhood raised by a single mother, the socioeconomic well-being of such families is a fundamental concern. We should protect disadvantaged children because they have not made the choices that have resulted in their socioeconomic conditions, or so goes the rhetoric on social class disparities in children's resources. Such discourse implicitly assumes mothers *have* made such choices. But women are also subject to structural conditions largely beyond their control. Debates about social assistance should acknowledge that job separation among single mothers is at

times involuntary, and that such involuntary events are associated with long-term unemployment, socioeconomic and social-psychological decline, and significant intergenerational effects. We should neither restrict assistance to the most disadvantaged mothers nor to those mothers only displaced in economic contractions, as particularly deleterious maternal displacement effects on life trajectories of children may accrue among otherwise more advantaged single parent families.

Biographies

Jennie E. Brand is Associate Professor of Sociology at the University of California – Los Angeles and Associate Director of the California Center for Population Research (CCPR). Her research centers on inequality and its implications for various outcomes that indicate life chances. This substantive focus accompanies a methodological focus on causal inference and the application and innovation of statistical models for panel data. Current research projects include evaluation of heterogeneity in the effects of education on socioeconomic outcomes and the socioeconomic and social-psychological consequences of job displacement.

Juli Simon Thomas is a Ph.D. candidate at the University of California – Los Angeles and a student affiliate at the California Center for Population Research (CCPR). Her research centers on social stratification and mobility. She is particularly interested in choices people make at transitional times in the life course, what disruptions in the life course mean to these transitional times, and the roles that education and income inequality play. Methodologically, she focuses on causal inference.

References

Abadie, Alberto; Drukker, David; Herr, Jane L.; Imbens, Guido W. Implementing Matching Estimators for Average Treatment Effects in Stata. Stata Journal. 2004; 4(3):290–311.

Amato, Paul R. Family Processes in One-Parent, Stepparent, and Intact Families: The Child's Point of View. Journal of Marriage and the Family. 1987; 49:327–337.

Amato, Paul R.; Keith, Bruce. Parental Divorce and Adult Well-Being: A Meta-Analysis. Journal of Marriage and Family. 1991; 53(1):43–58.

Ananat, Elizabeth O.; Gassman-Pines, Anna; Gibson-Davis, Christina M. The Effects of Local Employment Losses on Children's Educational Achievement. In: Duncan, Greg J.; Murname, Richard, editors. Whither Opportunity: Rising Inequality, Schools, and Children's Life Chances. New York: Russell Sage Foundation; 2011. p. 299-313.

Antel, John J. The Intergenerational Transfer of Welfare Dependency: Some Statistical Evidence. The Review of Economics and Statistics. 1992; 74(3):467–473.

Astone, Nan M.; McLanahan, Sara S. Family Structure, Residential Mobility, and School Dropout: A Research Note. Demography. 1994; 31:575–584. [PubMed: 7890092]

Attewell, Paul. The Impact of Family on Job Displacement and Recovery. The ANNALS of the American Academy of Political and Social Sciences. 1999; 562:66–82.

Brand, Jennie E. Enduring Effects of Job Displacement on Career Outcomes. University of Wisconsin – Madison, Doctoral Dissertation; 2004.

Brand, Jennie E. The Effects of Job Displacement on Job Quality: Findings from the Wisconsin Longitudinal Study. Research in Social Stratification and Mobility. 2006; 24:275–298.

Brand, Jennie E. Civic Returns to Higher Education: A Note on Heterogeneous Effects. Social Forces. 2010; 89(2):417–434.

Brand, Jennie E.; Burgard, Sarah A. Job Displacement and Social Participation over the Life Course: Findings for a Cohort of Joiners. Social Forces. 2008; 87(1):211–242.

Brand, Jennie E.; Davis, Dwight. The Impact of College Education on Fertility: Evidence for Heterogeneous Effects. Demography. 2011; 78(3)

Brand, Jennie E.; Levy, Becca; Gallo, William T. Effects of Layoffs and Plant Closings on Depression among Older Workers. Research on Aging. 2008; 30(6):701–721. [PubMed: 20011238]

Brand, Jennie E.; Thomas, Juli Simon. Causal Effect Heterogeneity. In: Morgan, Stephen L., editor. Handbook of Causal Analysis for Social Research. Springer Series; 2013. p. 189-214.

Brand, Jennie E.; Xie, Yu. Identification and Estimation of Causal Effects with Time-Varying Treatments and Time-Varying Outcomes. Sociological Methodology. 2007; 37:393–434.

Brand, Jennie E.; Xie, Yu. Who Benefits Most from College? Evidence for Negative Selection in Heterogeneous Economic Returns to Higher Education. American Sociological Review. 2010; 75(2):273–302. [PubMed: 20454549]

Brown, Susan L. Marriage and Child Well-Being: Research and Policy Perspectives. Journal of Marriage and Family. 2010; 72:1059–1077. [PubMed: 21566730]

Bureau of Labor Statistics. U.S. Department of Labor. National Longitudinal Survey of Youth 1979 cohort, 1979–2002 (rounds 1–20) [computer file]; Produced and distributed by the Center for Human Resource Research, The Ohio State University; Columbus, OH: 2008.

Bureau of Labor Statistics. U.S. Department of Labor, and National Institute for Child Health and Human Development. Children of the NLSY79, 1979–2002 [computer file]; Columbus, OH. Produced and distributed by the Center for Human Resource Research, The Ohio State University; p. 2008

Burgard, Sarah A.; Brand, Jennie E.; House, James S. Toward a Better Estimation of the Effect of Job Loss on Health. Journal of Health and Social Behavior. 2007; 48:369–384. [PubMed: 18198685]

Cancian, Maria; Meyer, Daniel M. Alternative Measures of Economic Success among TANF Participants: Avoiding Poverty, Hardship, and Dependence on Public Assistance. Journal of Policy Analysis and Management. 2004; 23:531–548.

Catalano, Ralph; Goldman-Mellow, Sidra; Saxton, Katherine; Margerison-Zilko, Calire; Subbaraman, Meenakshi; LeWinn, Kaja; Anderson, Elizabeth. The Health Effects of Economic Decline. Annual Review of Public Health. 2011; 32:431–450.

Cha, Youngjoo; Morgan, Stephen. Structural Earnings Losses and Between-Industry Mobility of Displaced Workers, 2003–2008. Social Science Research. 2010; 39:1137–1152.

Chan, Sewin; Stevens, Ann Huff. Job Loss and Employment Patterns of Older Workers. Journal of Labor Economics. 2001; 19:484–521.

Charles, Kerwin Kofi; Stephens, Melvin, Jr. Job Displacement, Disability, and Divorce. Journal of Labor Economics. 2004; 22:489–522.

Chase-Lansdale, PLindsay; Moffitt, Robert; Lohman, B.; Cherlin, Andrew; Coley, R.; Pittman, L., et al. Mothers' Transitions from Welfare to Work and the Well-Being of Preschoolers and Adolescents. Science. 2003; 299:1548–1552. [PubMed: 12624259]

Clark, Andrew. Unemployment as a Social Norm: Psychological Evidence from Panel Data. Journal of Labor Economics. 2003; 21(2):323–351.

Clark, Andrew. Boon or Bane? Others' Unemployment, Well-Being and Job Insecurity. Labour Economics. 2010; 17:52–61.

Coelli, Michael. Parental Job Loss and the Education Enrollment of Youth. Labour Economics. 2011; 18:25–35.

Coleman, James. Social Capital in the Creation of Human Capital. American Journal of Sociology. 1988; 94:S95–S120.

Coleman, James. Foundations of Social Theory. Cambridge, MA: Harvard University Press; 1990.

Conger, Rand D.; Conger, Katherine Jewsbury; Elder, Glen H. Family Economic Hardship and Adolescent Adjustment: Mediating and Moderating Processes. In: Duncan, Greg; Brooks-Gunn, Jeanne, editors. The Consequences of Growing up Poor. New York: Russell Sage Foundation; 1997.

Conger, Rand D.; Elder, Glen H. Families in Troubled Times. New York: Walter de Gruyter; 1994.

Couch, Kenneth A.; Jolly, Nicolas A.; Placzek, Dana W. Earnings Losses of Displaced Workers and the Business Cycle: An Analysis with Administrative Data. Economics Letters. 2011; 111:16–19.

Couch, Kenneth A.; Placzek, Dana A. Earning Losses of Displaced Workers Revisited. American Economic Review. 2010; 100(1):572–589.

Crosnoe, Robert; Cavanagh, Shannon E. Families with Children and Adolescents: A Review, Critique, and Future Agenda. Journal of Marriage and Family. 2010; 72:594–611.

Dahl, Greg; Lochner, Lance. The Impact of Family Income on Child Achievement." NBER Working Paper No. 11279. Cambridge, MA: National Bureau of Economic Research; 2005.

Danziger, Sheldon; Heflin, Colleen M.; Corcoran, Mary E.; Oltmans, Elizabeth; Wang, Hui-Chen. Does it Pay to Move from Welfare to Work? Journal of Policy Analysis and Management. 2002; 21(4):671–692.

Davis, James A. A Formal Interpretation of the Theory of Relative Deprivation. Sociometry. 1959; 22:280–296.

Davis, Steven; Wachter, Till von. Recessions and the Cost of Job Loss. Conference Draft for Brookings Papers on Economic Activity. 2011

Dooley, David; Fielding, Jonathon; Levi, Lennart. Health and Unemployment. Annual Review of Public Health. 1996; 17:449–465.

Dornbusch, Sanford M.; Carlsmith, JMerrill; Bushwall, Steven J.; Ritter, Philip L.; Leiderman, Herbert; Hastorf, Albert H.; Gross, Ruth T. Single Parents, Extended Households, and the Control of Adolescents. Child Development. 1985; 56:326–341. [PubMed: 3987411]

Duncan, Greg J.; Brooks-Gunn, Jeanne. The Consequences of Growing up Poor. New York: Russell Sage Foundation; 1997.

Duncan, Greg J.; Mathiowetz, Nancy. Out of Work, Out of Mind: Response Error in Retrospective Reports of Unemployment. Journal of Business and Economic Statistics. 1988; 6(2):221–229.

Duncan, Greg J.; Ziol-Guest, Kathleen; Kalil, Ariel. Early-Childhood Poverty and Adult Attainment, Behavior, and Health. Child Development. 2010; 81(1):306–325. [PubMed: 20331669]

Duncan, Greg J.; Yeung, Jean; Gunn, Jeanne Brooks; Smith, Jeffrey. How Much Does Childhood Poverty Affect the Life Chances of Children? American Sociological Review. 1998; 63(3):406–423.

Edin, Katherine; Kefalas, Maria. Promises I Can Keep: Why Poor Women Put Motherhood Before Marriage. Berkeley: University of California Press; 2005.

Edin, Katherine; Lein, Laura. Work, Welfare, and Single Mothers' Economic Survival Strategies. American Sociological Review. 1997a; 62(2):253–266.

Edin, Katherine; Lein, Laura. Making Ends Meet: How Single Mothers Survive Welfare and Low-Wage Work. New york: Russell Sage Foundation; 1997b.

Elder, Glen. Children of the Great Depression. Chicago: University of Chicago Press; 1974.

Elder, Glen. The Life Course and Human Development. In: Damon, W.; Lerner, RM., editors. Handbook of Child Psychology. Theoretical Models of Human Development. Vol. 1. New York: Wiley; 1998. 1998. p. 939-991.

Elder, Glen H.; Nguyen, T.; Caspi, A. Linking Family Hardship to Children's Lives. Child Development. 1985; 56:361–375. [PubMed: 3987413]

Ellwood, David T.; Jencks, Christopher. The Uneven Spread of Single-Parent Families: What Do We Know? Where Do We Look for Answers?. In: Neckerman, KM., editor. Social Inequality. New York: Russell Sage Foundation; 2004. p. 3-77.

Elwert, Felix; Winship, Christopher. Endogenous Selection Bias. Working Paper; 2013.

Fallick, Bruce. A Review of the Recent Empirical Literature on Displaced Workers. Industrial and Labor Relations Review. 1996; 50:5–16.

Farber, Henry S. The Incidence and Costs of Job Loss: 1982-91. Brookings Papers on Economic Activity. Microeconomics. 1993a; 1:73–119.

Farber, Henry S. The Changing Face of Job Loss in the United States, 1981–1995. Brookings Papers on Economic Activity. Microeconomics. 1993b; 1:55–42.

Farber, Henry S. What do we know about job loss in the United States? Evidence from the Displaced Workers Survey, 1984–2004. Economic Perspectives. 2005; 2Q:13–28.

Farber, Henry S. Job Loss and the Decline of Job Security in the United States. In: Abraham, Katharine G.; Spletzer, James R.; Harper, Michael, editors. Labor in the New Economy. Chicago: University of Chicago Press; 2010. p. 223

Farley, Reynolds. The New American Reality: Who We Are, How We Got Here, Where We Are Going. New York, NY: Russell Sage Foundation; 1996.

Furstenberg, Frank; Cook, Thomas; Eccles, Jacquelynne; Elder, Glen; Sameroff, Arnold. Managing to Make It: Urban Families and Adolescent Success. Chicago: University of Chicago Press; 1999.

Gibbons, Robert; Katz, Lawrence. Layoffs and Lemons. Journal of Labor Economics. 1991; 9:351–380.

Hao, Lingxin; Brinton, Mary C. Productive Activities and Support Systems of Single Mothers. The American Journal of Sociology. 1997; 102(5):1305–1344.

Harknett, Kristin. The Relationship Between Private Safety Nets and Economic Outcomes Among Single Mothers. Journal of Marriage and Family. 2006; 68:172–191.

Harris, Kathleen Mullan. Work and Welfare Among Single Mothers in Poverty. American Journal of Sociology. 1993; 99(2):317–352.

Haveman, Robert; Wolfe, Barbara; Spaulding, James. Childhood Events and Circumstances Influencing High School Completion. Demography. 1991; 28:133–157. [PubMed: 2015940]

Heckman, James J. The Scientific Model of Causality. In: Stolzenberg, Ross M., editor. Sociological Methodology. Vol. 35. Boston, MA: Blackwell Publishing; 2005. p. 1-98.

Herr, Jane L.; Drukker, David; Imbens, Guido W.; Abadie, Alberto. NNMATCH: Matching Estimator for Average Treatment Effects in Stata. 2004

Hill, Heather D.; Morris, Pamela A.; Castells, Nina; Walker, Jessica Thornton. Getting a Job is Only Half the Battle: Maternal Job Loss and Child Classroom Behavior in Low-Income Families. Journal of Policy Analysis and Management. 2011; 30(2):310–333. [PubMed: 22162901]

Holland, Paul W. Causal Inference, Path Analysis, and Recursive Structural Equation Models. Sociological Methodology. 1988; 18:449–484.

Imbens, Guido W. Nonparametric Estimation of Average Treatment Effects under Exogeneity: A Review. The Review of Economics and Statistics. 2004; 86:4–29.

Jackson, Margot; Mare, Robert. Distinguishing between the Effects of Residential Mobility and Neighborhood Change on Children's Well-Being: A Research Note. California Center for Population Research Working Paper CCPR-2009-016. 2009

Jacobson, Louis S.; LaLonde, Robert J.; Sullivan, Daniel G. Earnings Losses of Displaced Workers. American Economic Review. 1993; 83:685–709.

Jahoda, Marie; Lazarsfeld, Paul F.; Zeisel, Hans. Marienthal: The Sociography of an Unemployed Community. 1933[1971] Transaction Publishers.

Jahoda, Marie. Employment and Unemployment: A Social Psychological Analysis. Cambridge: Cambridge University Press; 1982.

Jann, Ben; Brand, Jennie E.; Xie, Yu. HTE: Stata module to perform heterogeneous treatment effect analysis by propensity score stratification with a multilevel model. 2010. in Stata: ssc install hte; http://ideas.repec.org/c/boc/bocode/s457129.html

Jann, Ben; Brand, Jennie E.; Xie, Yu. HTE2: Stata module to perform nonparametric heterogeneous treatment effect analysis by propensity score matching with local smoothing. 2010

Jencks, Christopher; Mayer, Susan. The Social Consequences of Growing up in a Poor Neighborhood. In: Lynn, L., Jr; McGeary, MGH., editors. Inner-City Poverty in the United States. Washington D.C: National Academy Press; 1990. p. 11-95.

Johnson, Rucker C.; Kalil, Ariel; Dunifon, Racehl E. Employment Patterns of Less-Skilled Workers: Links to Children's Behavior and Academic Progress. Demography. 2012; 49:747–772. [PubMed: 22246798]

Kalil, Ariel; Duniform, Rachel; Danziger, Sandra. Are Children's Behavior Problems Affected by their Mothers' Work Participation since Welfare Reform. In: Duncan, Greg J.; Chase-Lansdale, P. Lindsay, editors. For Better and for Worse: Welfare Reform and the Well-Being of Children and Families. New York: Russell Sage Foundation; 2001.

Kalil, Ariel; Wightman, Patrick. Parental Job Loss and Children's Educational Attainment in Black and White Middle-Class Families. Social Science Quarterly. 2011; 92(1):57–78. [PubMed: 21523947]

Kalil, Ariel; Ziol-Guest, Kathleen M. Single Mothers' Employment Dynamics and Adolescent Well-Being. Child Development. 2005; 76(10):196–211. [PubMed: 15693767]

Kalil, Ariel; Ziol-Guest, Kathleen M. Parental employment circumstances and children's academic progress. Social Science Research. 2008; 37:500–515.

Kalleberg, Arne L. Changing Contexts of Careers: Trends in Labor Market Structures and Some Implications for Labor Force Outcomes. In: Kerkhoff, AC., editor. Generating Social Stratification: Toward a New Research Agenda. Boulder: Westview Press; 2000.

Kalleberg, Arne L. Precarious Work, Insecure Workers: Employment Relations in Transition. American Sociological Review. 2009; 74(1):1–22.

Kessler, Ronald C.; Turner, JBlake; House, James S. Unemployment, Reemployment, and Emotional Functioning in a Community Sample. American Sociological Review. 1989; 54:648–657.

Kletzer, Lori. Earnings after Job Displacement: Job Tenure, Industry and Occupation. In: Addison, JT., editor. Job Displacement: Consequences and Implications for Policy. Detroit: Wayne State University Press; 1991.

Kletzer, Lori. Job Displacement. Journal of Economic Perspectives. 1998; 12:115–136.

Kletzer, Lori; Fairlie, Robert W. The Long-Term Costs of Job Displacement for Young Adult Workers. Industrial and Labor Relations Review. 2003; 56(4):682–698.

Krashinsky, Harry. Evidence on Adverse Selection and Establishment Size in the Labor Market. Industrial and Labor Relations Review. 2002; 56(1):84–96.

Leana, Carrie; Feldman, Daniel. Coping with Job Loss: How Individuals, Organizations, and Communities Respond to Layoffs. New York: Lexington; 1992.

Leuven, Edwin; Sianesi, Barbara. PSMATCH2: Stata Module to Perform Full Mahalanobis and Propensity Score Matching, Common Support Graphing, and Covariate Imbalance Testing. 2003. http://ideas.repec.org/c/boc/bocode/s432001.html. Version 3.1.5

Leventhal, Tama; Brooks-Gunn, Jeanne. The Neighborhoods They Live In: The Effects of Neighborhood Residence on Child and Adolescent Outcomes. Psychological Bulletin. 2000; 126(2):309–337. [PubMed: 10748645]

Levy, Frank. Incomes and Income Inequality. In: Farley, R., editor. State of the Union: America in the 1990s. New York, NY: Russell Sage Foundation; 1995. p. 1-58.

Lovell, Phillip; Isaacs, Julia B. Families of the Recession: Unemployed Parents and their Children. Washington D.C: First Focus Campaign for Children and the National Association for the Education of Homeless Children and Youth; 2010. Available online at www.firstfocus.net

MacLeod, Jane; Shanahan, Micahel. Poverty, Parenting, and Children's Mental Health. American Sociological Review. 1993; 58(3):351–366.

Mayer, Susan; Jencks, Christopher. Growing up in a Poor Neighborhood: How Much Does it Matter? Science. 1989; 243:1441–1445. [PubMed: 17839748]

McLanahan, Sara. Family Structure and Stress: A Longitudinal Comparison of Two-Parent and Female-Headed Families. Journal of Marriage and Family. 1983; 45:347–357.

McLanahan, Sara S. Family Structure and the Intergenerational Transmission of Poverty. American Journal of Sociology. 1985; 90:873–901.

McLanahan, Sara. Diverging Destinies: How Children Are Faring under the Second Demographic Transition. Demography. 2004; 41(4):607–627. [PubMed: 15622946]

McLanahan, Sara. Fragile Families and the Reproduction of Poverty. Annals of the American Academy of Political and Social Science. 2009; 621:111–131. [PubMed: 20204078]

McLanahan, Sara; Percheski, Christine. Family Structure and the Reproduction of Inequalities. Annual Review of Sociology. 2008; 34:257–276.

McLanahan, Sara; Sandefur, Gary. Growing Up with a Single Parent: What Hurts? What Helps?. Boston: Harvard University Press; 1994.

McLeod, Jane; Shanahan, Michael J. Poverty, Parenting and Children's Mental Health. American Sociological Review. 1993; 53(3):351–366.

McLoyd, Vonnie C. The Impact of Economic Hardship on Black Families and Children: Psychological Distress, Parenting, and Socioemotional Development. Child Development. 1990; 61(2):311–346. [PubMed: 2188806]

McLoyd, Vonnie C. Socioeconomic Disadvantage and Child Development. American Psychologist. 1998; 53:185–204. [PubMed: 9491747]

McLoyd, Vonnie C.; Jayaratne, Toby E.; Ceballo, Rosario; Borquez, Julio. Unemployment and Work Interruption among African American Single Mothers: Effects on Parenting and Socioeconomic Functioning. Child Development. 1994; 65:562–589. [PubMed: 8013240]

McLoyd, Vonnie C.; Wilson, Leon. Maternal Behavior, Social Support, and Economic Conditions as Predictors of Distress in Children. New Directions for Child Development. 1990; 46:49–69. [PubMed: 2348935]

Meadows, Sarah O.; McLanahan, Sara S.; Brooks-Gunn, Jeanne. Parental Depression and Anxiety and Early Childhood Behavioral Problems across Family Types. Journal of Marriage and Family. 2007; 69:1162–1177.

Merton, Robert K.; Kitt, AS. Contributions to the Theory of Reference Group Behavior. In: Merton, RK.; Lazarsfeld, PF., editors. Continuities in Social Research: Studies in the Scope and Method of “The American Soldier”. Glencoe, Ill: Free Press; 1950. p. 40-105.

Miller, Michael V.; Hoppe, Sue Keir. Attributions for Job Termination and Psychological Distress. Human Relations. 1994; 47:307–328.

Mistry, Rashmita S.; Crosby, Danielle A.; Huston, Aletha C.; Casey, David M.; Ripke, Marika N. Lessons form New Hope: The Impact on Children’s Well-Being of a Work-Based Antipoverty Program for Parents. In: Duncan, Greg J.; Chase-Lansdale, P. Lindsay, editors. For Better or for Worse: Welfare Reform and the Well-being of Children. New York: Russell Sage Foundation; 2001.

Morgan, Stephen; Harding, David. Matching Estimators of Causal Effects: Prospects and Pitfalls in Theory and Practice. Sociological Methods and Research. 2006; 35(1):3–60.

Morgan, Stephen; Winship, Christopher. Counterfactuals and Causal Inference: Methods and Principles for Social Research. Cambridge, UK: Cambridge University Press; 2007.

Musick, Kelly; Brand, Jennie E.; Davis, Dwight. Variation in the Relationship Between Education and Marriage: Marriage Market Mismatch? Journal of Marriage and Family. 2012; 74:53–69. [PubMed: 22563132]

Newman, Katherine S. Falling from Grace: The Experience of Downward Mobility in the American Middle Class. New York, NY: Vintage Books; 1988.

Oreopoulos, Philip; Page, Marianne; Stevens, Ann Huff. The Intergenerational Effects of Worker Displacement. Journal of Labor Economics. 2008; 6(3):455–483.

Page, Marianne; Stevens, Ann Huff; Lindo, Jason. Parental Income Shocks and Outcomes of Disadvantaged Youth in the United States. In: Gruber, J., editor. The Problems of Disadvantaged Youth: An Economic Perspective. University of Chicago Press; 2009. p. 213-236.

Pearl, Judea. Causality: Models, Reasoning, and Inference. 2nd Edition. Cambridge: Cambridge University Press; 2009.

Pearlin, Leonard; Lieberman, Morton; Menaghan, Elizabeth; Mullan, Joseph. The Stress Process. Journal of Health and Social Behavior. 1981; 22:337–356. [PubMed: 7320473]

Pebley, Anne; Sastry, Narayan. Neighborhoods, Poverty, and Children's Well-Being. In: Neckerman, K., editor. Social Inequality. New York: Russell Sage Foundation; 2004. p. 165-178.

Podgursky, Michael; Swaim, Paul. Job Displacement and Earnings Loss: Evidence from the Displaced Worker Survey. Industrial and Labor Relations Review. 1987; 41:17–29.

Radloff, Lenore S. The CES-D Scale: A Self-Report Depression Scale for Research in the General Population. Applied Psychological Measurement. 1977; 1:385–401.

Rege, Mari; Telle, Kjetil; Votruba, Mark. Parental Job Loss and Children's School Performance. Review of Economic Studies. 2011

Reich, Michael. High Unemployment After the Great Recession: Why? What Can We Do? Institute for Research on Labor and Employment, University of California – Berkeley Policy Brief, June 2010. 2010

Rosenbaum, Paul R.; Rubin, Donald B. The Central Role of the Propensity Score in Observational Studies for Causal Effects. Biometrika. 1983; 70:41–55.

Rosenbaum, Paul R.; Rubin, Donald B. Reducing Bias in Observational Studies Using Subclassification on the Propensity Score. Journal of the American Statistical Association. 1984; 79:516–524.

Rosenbaum, Paul R.; Rubin, Donald B. Constructing a Control Group Using Multivariate Matched Sampling Methods that Incorporate the Propensity Score. The American Statistician. 1985; 39(1):33–38.

Rubin, Donald. Estimating Causal Effects of Treatments in Randomized and Nonrandomized Studies. Journal of Educational Psychology. 1974; 66:685–701.

Rubin, Donald. Estimating Causal Effects from Large Data Sets Using Propensity Scores. Annals of Internal Medicine. 1997; 127:757–763. [PubMed: 9382394]

Ruhm, Christopher J. Are Workers Permanently Scarred by Job Displacement? The American Economic Review. 1991; 81:319–324.

Sampson, Robert; Morenoff, Jeffrey; Earls, Felton. Beyond Social Capital: Spatial Dynamics of Collective Efficacy for Children. American Sociological Review. 1999; 64:633–660.

Sandefur, Rebecca; Laumann, Edward. A Paradigm for Social Capital. Rationality and Society. 1998; 10:481–501.

Scott, Ellen K.; Edin, Kathryn; London, Andrew S.; Mazelis, Joan. 'My Children Come First': Welfare-Reliant Women's Post-TANF Views of Work-Family Trade-Offs and Marriage. In: Duncan, Greg J.; Chase-Lansdale, P. Lindsay, editors. For Better and for Worse: Welfare Reform and the Well-Being of Children and Families. New York: Russell Sage Foundation; 2001.

Seitchik, Adam. Who Are Displaced Workers?. In: Addison, JT., editor. Job Displacement: Consequences and Implications for Policy. Detroit, MI: Wayne State University Press; 1991.

Seltzer, Judith. Consequences of Marital Dissolution for Children. Annual Review of Sociology. 1994; 20:235–266.

Shonkoff, Jack; Phillips, Deborah A., editors. From Neurons to Neighborhoods: The Science of Early Childhood Development. Washington D.C: National Academy Press; 2000.

Sobel, Michael E. Identification of Causal Parameters in Randomized Studies with Mediating Variables. Journal of Educational and Behavioral Statistics. 2008; 33(2):230–251.

Stevens, Ann Huff; Schaller, Jessamyn. Short-Run Effects of Parental Job Loss on Children's Academic Achievement. Economic of Education Review. 2010; 30(2):289–299.

Strully, Kate W. Job Loss and Health in the U.S. Labor Market. Demography. 2009; 46(2):221–246. [PubMed: 21305391]

Sullivan, Daniel; Wachter, Till von. Job Displacement and Mortality: An Analysis Using Administrative Data. Quarterly Journal of Economics. 2009; 124:1265–1306.

Turner, JBlake. Economic Conditions and the Health Effects of Unemployment. Journal of Health and Social Behavior. 1995; 36:213–229. [PubMed: 7594355]

Turney, Kristin. Chronic and Proximate Depression among Mothers: Implications for Child Well-being. Journal of Marriage and Family. 2011; 73:149–163.

U.S. Census Bureau. Custodial Mothers and Fathers and their Child Support: 2007. Nov.2009

Vander Weele, Tyler J.; Robins, James. Four Types of Effect Modification: A Classification Based upon on Directed Acyclic Graphs. Epidemiology. 2007; 18(5):561–568. [PubMed: 17700242]

Von Wachter, Till. Long-Term Employment: Causes, Consequences, and Solutions. Testimony before the Joint Economic Committee of the U.S. Congress. 2010

Western, Bruce; Bloome, Deidre; Percheski, Christine. Inequality among American Families with Children, 1975 to 2005. American Sociological Review. 2008; 73(6):903–920.

Wetzel, James R. Labor Force, Unemployment and Earnings. In: Farley, R., editor. State of the Union: America in the 1990s. New York, NY: Russell Sage Foundation; 1995. p. 59-105.

Wilson, William Julius. The Truly Disadvantaged: The Inner City, the Underclass, and Public Policy. Chicago, IL: University of Chicago Press; 1987.

Xie, Yu; Brand, Jennie; Jann, Ben. Estimating Heterogeneous Treatment Effects with Observational Data. Sociological Methodology. 2012:42.

Yoshikawa, Hirokazu; Weisner, Thomas S.; Lowe, Edward D., editors. Making it Work: Low-Wage Employment, Family Life, and Child Development. New York: Russell Sage Foundation; 2006.

Appendix A

All matching estimators of the *TT* take the following general form:

$$\hat{TT} = {}^{1}\!/_{n_1} \sum_{i}^{n_i} (y_{i,d=1} - \sum_{i(j)}^{iJ} w_{i(j)} y_{i(j),d=0}), \quad \text{(A1)}$$

where n_1 is the number of treatment cases, *i* is the index over treatment cases, *i(j)* is the index over untreated cases for treated case *i (i(j)=1,…i(J)*, and $w_{i(j)}$ is the scaled weight (with sum of one) that measures the relative importance of each untreated case. The estimator for the *TUT is* simply the corollary, where each untreated case is matched to a treated case. Using kernel matching, all untreated units are used and weighted according to the distance from the estimated propensity score of the target treated unit. We define the kernel matching weight as:

$$w_{i(j)} = \frac{G\left[\frac{\hat{P}(s_j) - \hat{P}(s_i)}{a_n}\right]}{\sum_{j} G\left[\frac{\hat{P}(s_j) - \hat{P}(s_i)}{a_n}\right]}, \quad \text{(A2)}$$

where a_n is a bandwidth parameter that scales the difference in the estimated propensity scores based on the sample size and $P-$ (.) is the estimated propensity score. While scholars have not reached a consensus as to which matching estimator performs best in each application, or which expected variance of matching estimates should be used (Morgan and Harding 2006; Morgan and Winship 2007), Morgan and Winship (2007) find that kernel matching (Leuven and Sianesi 2003) has the least bias with a well-specified propensity equation.

Appendix B

Covariate Means by Maternal Displacement and Propensity Score Strata

	Stratum 1 p = [0–.05)			Stratum 2 p = [.05–.10)			Stratum 3 p = [.10–.15)			Stratum 4 p = [.15–.20)			Stratum 5 p = [.20–1)		
	$E(X)\|$ d=0	$E(X)\|$ d=1	B	$E(X)\|$ d=0	$E(X)\|$ d=1	B	$E(X)\|$ d=0	$E(X)\|$ d=1	B	$E(X)\|$ d=0	$E(X)\|$ d=1	B	$E(X)\|$ d=0	$E(X)\|$ d=1	B
Maternal time-invariant covariates															
Black (0/1)	0.080	0.101	0.016	0.316	0.278	0.012	0.467	0.564	0.010	0.854	0.928	0.120	0.770	0.967	0.103
Hispanic (0/1)	0.107	0.053	0.053	0.124	0.079	0.019	0.059	0.119	0.075	0.049	0.072	0.155	0.018	0.033	0.130
(Grand)mother's years of education	10.987	11.610	0.102	9.696	9.860	0.060	10.084	10.037	0.239	10.262	10.125	0.094	9.504	10.081	0.161
(Grand)parents' intact family age 14 (0/1)	0.697	0.720	0.079	0.611	0.630	0.052	0.539	0.504	0.004	0.579	0.695	0.227	0.503	0.521	0.048
(Grand)parents' southern residence (0/1)	0.297	0.178	0.002	0.486	0.502	0.103	0.362	0.343	0.015	0.612	0.639	0.179	0.623	0.658	0.272
Mental ability (ASVAB) (−3-3)	0.026	0.004	0.257	−0.429	−0.764	0.017	−0.642	−0.609	0.020	−0.618	−0.246	0.097	−0.611	−0.328	0.213
Locus of control (6–14)	8.589	8.697	0.049	9.749	10.094	0.140	9.532	8.816	0.057	10.230	8.637	0.174	9.742	9.070	0.245
Delinquency (0/1)	0.671	0.824	0.118	0.842	0.798	0.157	0.848	0.880	0.011	0.803	0.854	0.090	0.846	1.000	0.407
Maternal covariates, child age 0															
Age	22.100	22.230	0.183	20.697	23.104	0.026	20.058	20.759	0.335	20.353	22.448	0.091	19.611	19.708	0.185
Number of children	1.699	1.430	0.001	1.873	1.867	0.018	1.954	1.682	0.058	1.573	2.362	0.262	1.410	1.463	0.064
Marital / cohab. partner (0/1)	0.909	0.772	0.024	0.586	0.681	0.005	0.161	0.227	0.175	0.227	0.000	0.038	0.023	0.000	0.084
High school completion (0/1)	0.780	0.778	0.192	0.654	0.792	0.049	0.655	0.594	0.073	0.727	0.824	0.007	0.888	0.837	0.213
College completion (0/1)	0.053	0.013	0.390	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Region (0/1)	0.490	0.445	0.054	0.352	0.339	0.069	0.526	0.274	0.045	0.209	0.215	0.033	0.252	0.283	0.239
Employer tenure (weeks)	15.113	11.668	0.101	9.934	9.276	0.085	6.470	6.904	0.089	4.011	13.331	0.240	8.514	9.539	0.001
Full-time employment (0/1)	0.995	0.963	0.031	1.000	1.000	0.010	1.000	1.000	0.000	1.000	1.000	0.000	1.000	1.000	0.000
Manufacturing worker (0/1)	0.067	0.019	0.048	0.185	0.064	0.020	0.122	0.169	0.034	0.076	0.312	0.282	0.424	0.360	0.155
Trade worker (0/1)	0.186	0.186	0.026	0.143	0.164	0.007	0.114	0.166	0.103	0.059	0.174	0.152	0.075	0.068	0.188
Child outcomes in young adulthood															
High school completion (0/1)	0.802	0.835		0.664	0.594		0.733	0.666		0.837	0.672		0.845	0.857	
Some college attendance (0/1)	0.516	0.434		0.313	0.168		0.260	0.480		0.346	0.305		0.478	0.313	
College completion (0/1)	0.237	0.198		0.084	0.123		0.098	0.237		0.095	0.233		0.125	0.059	
CESD age 20–24 (0–1)	0.216	0.313		0.238	0.325		0.283	0.328		0.207	0.234		0.289	0.288	
CESD age 25–29 (0–1)	0.198	0.206		0.198	0.348		0.225	0.233		0.222	0.286		0.319	0.281	

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	Stratum 1 p = [0–.05)			Stratum 2 p = [.05–.10)			Stratum 3 p = [.10–.15)			Stratum 4 p = [.15–.20)			Stratum 5 p = [.20–1)		
	$E(X)\|d=0$	$E(X)\|d=1$	B	$E(X)\|d=0$	$E(X)\|d=1$	B	$E(X)\|d=0$	$E(X)\|d=1$	B	$E(X)\|d=0$	$E(X)\|d=1$	B	$E(X)\|d=0$	$E(X)\|d=1$	B
Sample Size	2369	172		1555	223		518	79		294	85		309	93	

Notes: Sample restricted to children whose mothers were not continuously married and living with their spouse, for whom we have data on job separation, and for children who were at least 19 years old in 2010 (n=5,697). $E(X)|d=0$ indicates the mean of X for children whose mothers were not displaced and $E(X)|d=1$ indicates the mean of X for children whose mothers were displaced. B is the standardized difference metric between the treated and control groups for X.

Appendix C

Covariate Means for Children of Displaced Mothers by Multistate Displacement Indicators

	Mother displaced during recessionary period	Mother displaced during non-recessionary period	Mother displaced in LMA with high unemployment	Mother displaced in LMA without high unemployment
Maternal time-invariant covariates				
Black (0/1)	0.360	0.394	0.411	0.382
Hispanic (0/1)	0.111	0.056	0.172	0.035
(Grand)mother's years of education	10.277	10.702	9.975	10.763
(Grand)parents' intact family age 14 (0/1)	0.793	0.613	0.530	0.684
(Grand)parents' southern residence (0/1)	0.392	0.391	0.292	0.434
Mental ability (ASVAB) (−3–3)	−0.181	−0.430	−0.331	−0.367
Locus of control (6–14)	8.811	9.265	8.871	9.271
Delinquency (0/1)	0.731	0.888	0.896	0.827
Maternal covariates, child age 0				
Age	22.923	21.869	20.860	22.522
Number of children	1.681	1.734	1.505	1.768
Marital / cohab. partner (0/1)	0.549	0.510	0.499	0.525
High school completion (0/1)	0.859	0.749	0.880	0.744
College completion (0/1)	0.000	0.006	0.000	0.006
Region (0/1)	0.349	0.357	0.402	0.335
Employer tenure (weeks)	8.622	10.647	18.874	7.835
Full-time employment (0/1)	1.000	0.982	1.000	0.982
Manufacturing worker (0/1)	0.143	0.103	0.205	0.091
Trade worker (0/1)	0.181	0.153	0.120	0.177
Child outcomes in young adulthood				
High school completion (0/1)	0.818	0.723	0.727	0.748
Some college attendance (0/1)	0.306	0.352	0.393	0.336
College completion (0/1)	0.072	0.168	0.235	0.122
CESD age 20–24 (0–1)	0.244	0.328	0.225	0.322
CESD age 25–29 (0–1)	0.197	0.282	0.200	0.270
Sample Size	203	507	161	491

Notes: Sample restricted to children whose mothers were not continuously married and living with their spouse, for whom we have data on job separation, and for children who were at least 19 years old in 2010 (n=5,697). Recessionary periods include 1990-92, 2001-02, and 2008-10; non-recessionary periods include the remaining periods. High unemployment areas include any displacement that occurred when the respondent lived in a labor market area (LMA) with at least 9 percent unemployment; without high unemployment areas include those with less than 9 percent unemployment.

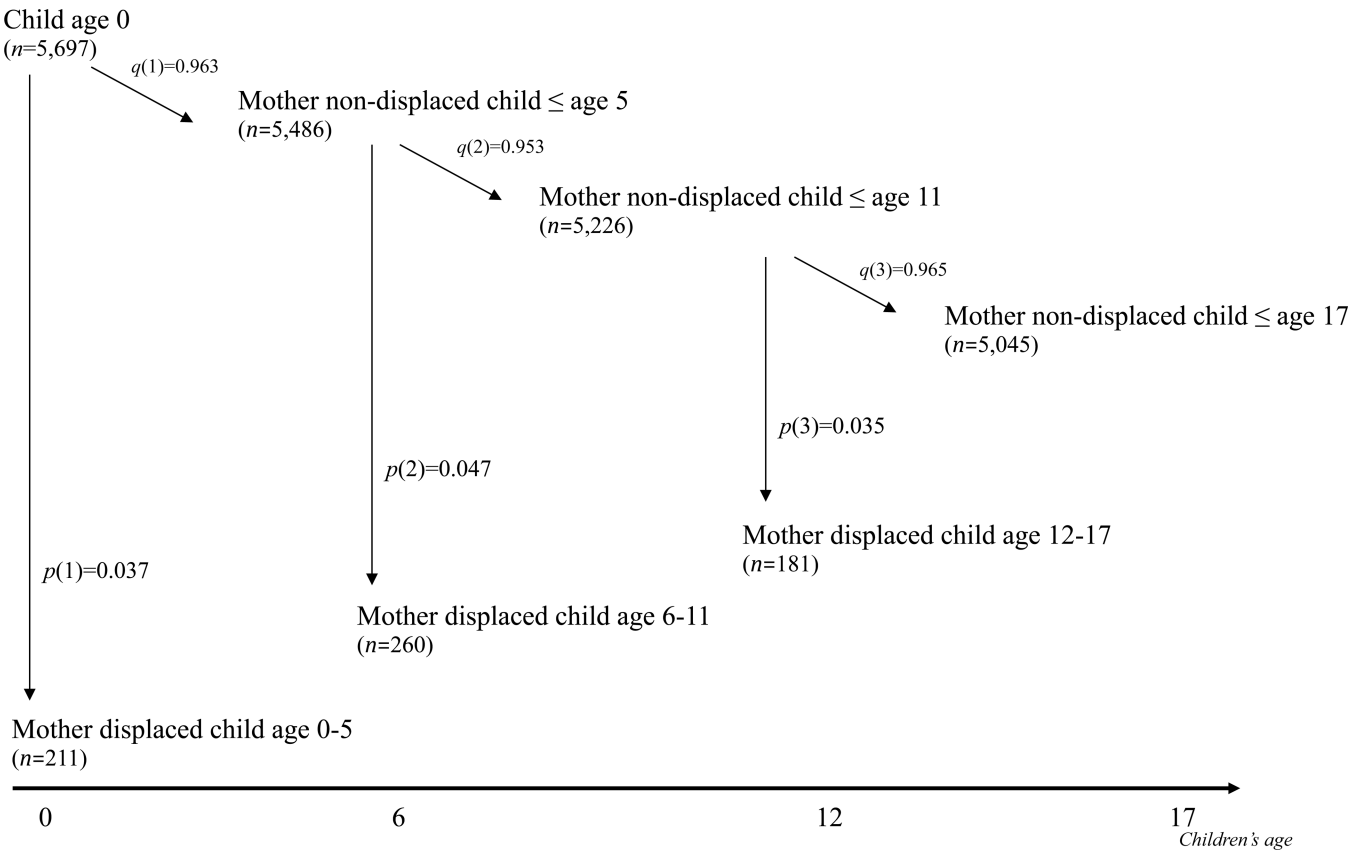
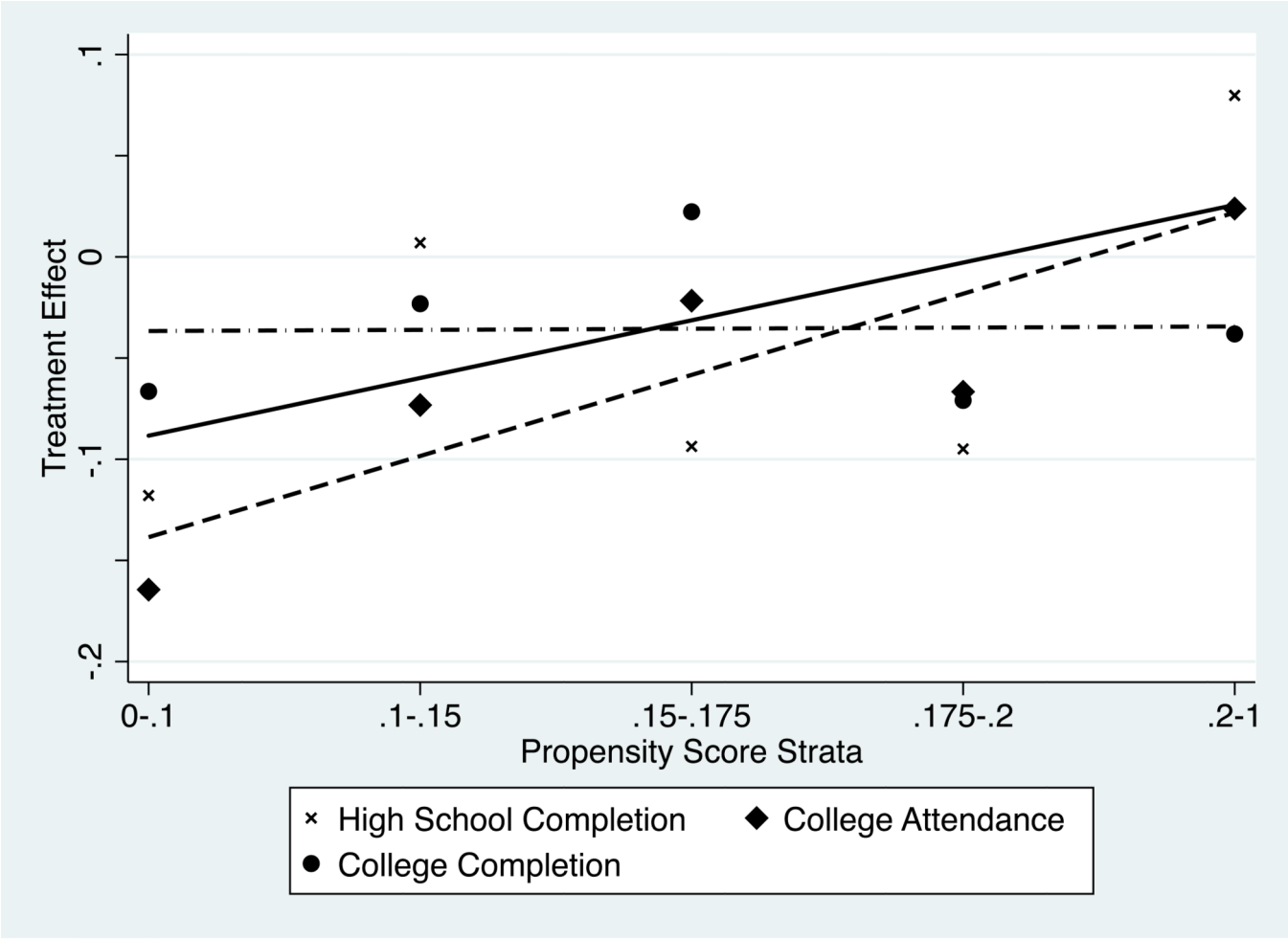
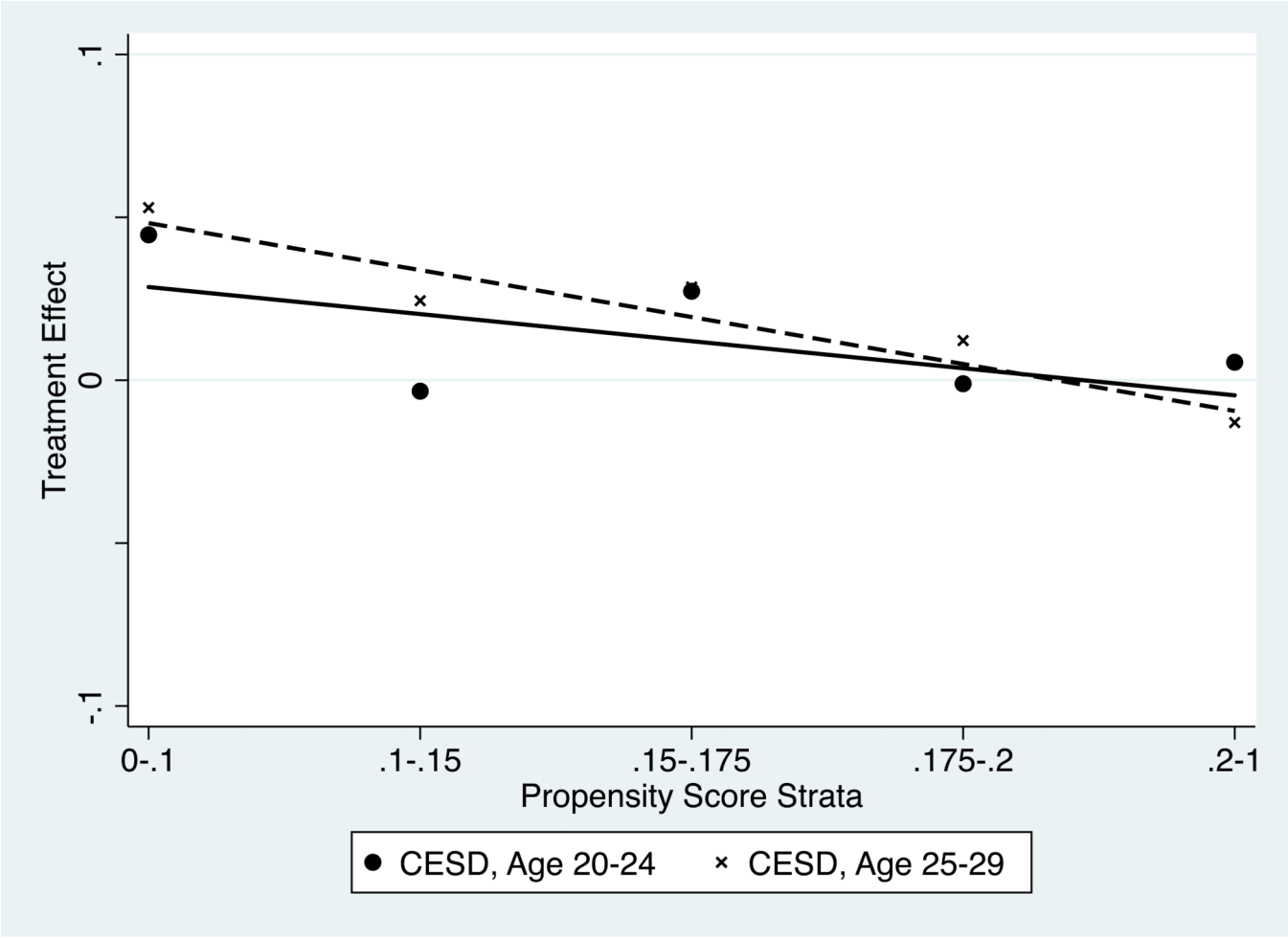


Figure 1.
Time-Varying Treatment Flow Chart: Maternal Job Displacement by Child Age
Note: p(k) + q(k) = 1.



A:

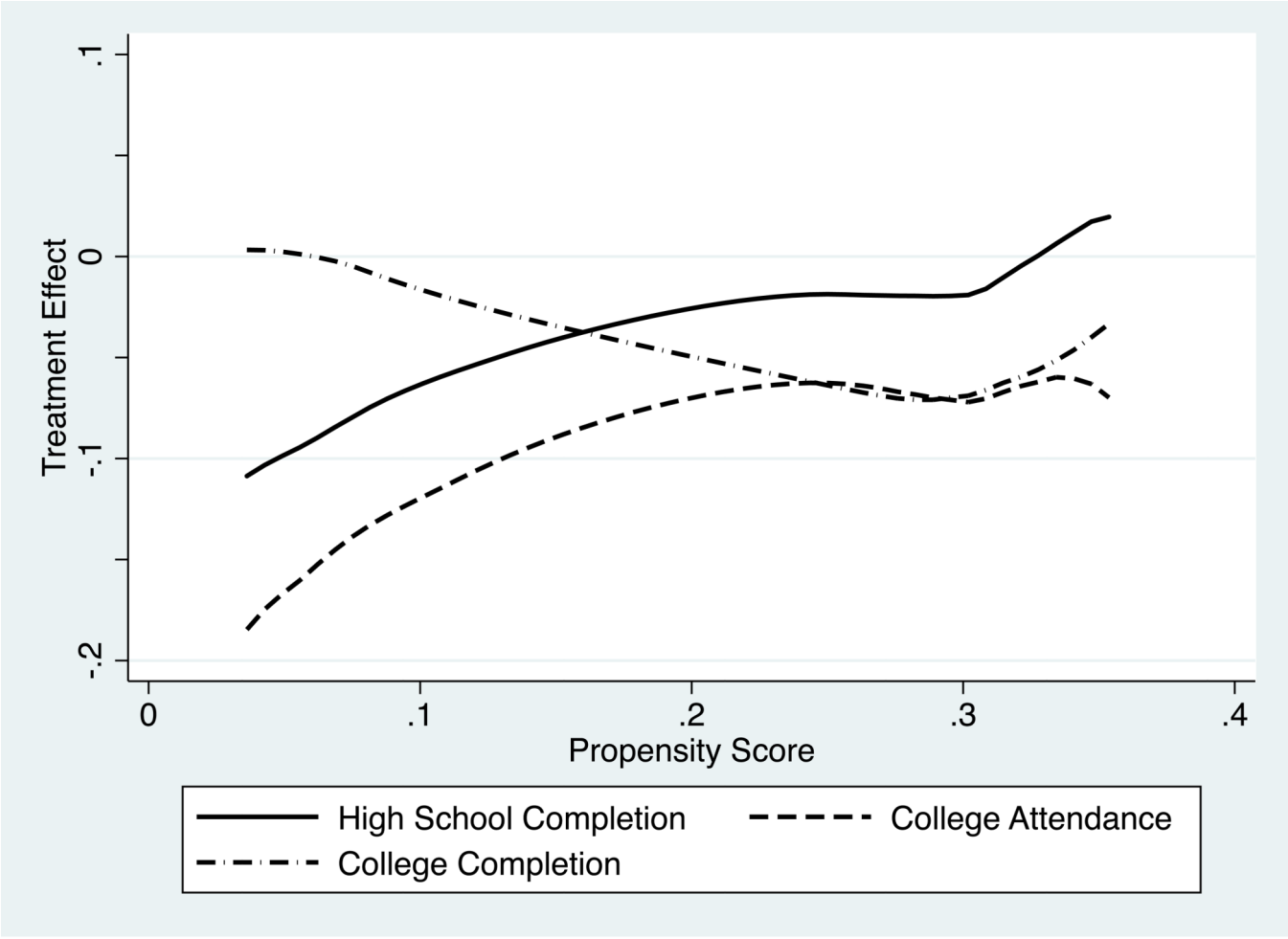


B:

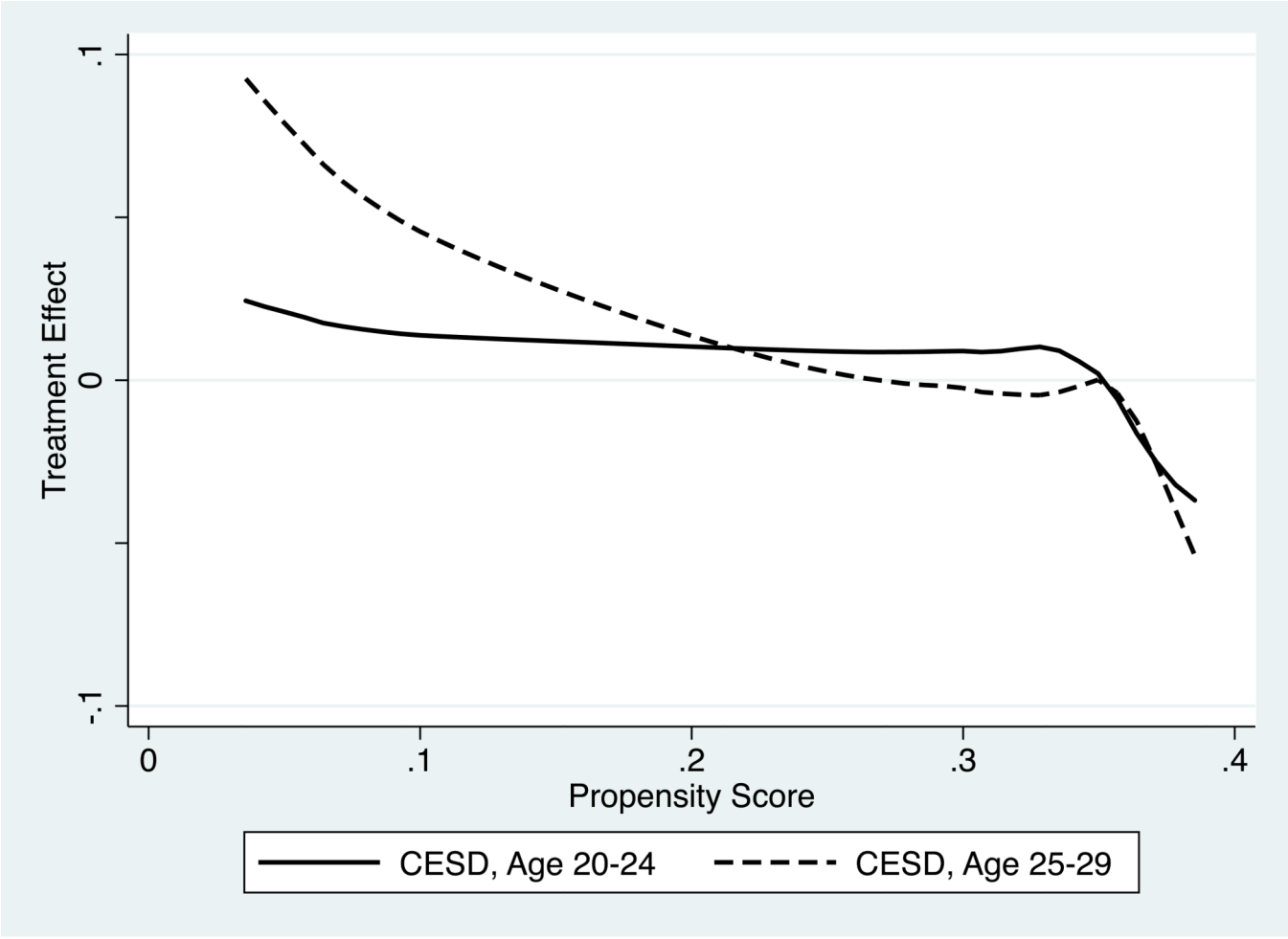
Figure 2.

A: Stratification-Multilevel (SM) Heterogeneous Maternal Displacement on Children's Educational Attainment

B: Stratification-Multilevel (SM) Heterogeneous Maternal Displacement on Children's Social-Psychological Well-Being



A:



B:

Figure 3.

A: Matching-Smoothing (MS) Heterogeneous Maternal Displacement on Children's Educational Attainment

B: Matching-Smoothing (MS) Heterogeneous Maternal Displacement on Children's Social-Psychological Well-Being

Table 1

Descriptive Statistics: NLSY Women (1979–2010) and NLSCM Children (1986–2010)

	Mother not displaced child age 0–17		Mother displaced child age 0–17		t-tests
	Mean/Prop.	**(SD)**	**Mean/Prop.**	**(SD)**	
Maternal time-invariant covariates					
Black (0/1)	0.248	-	0.389	-	***
Hispanic (0/1)	0.101	-	0.067	-	
(Grand)mother's years of education	10.429	(2.699)	10.577	(2.399)	†
(Grand)parents' intact family age 14 (0/1)	0.643	-	0.648	-	*
(Grand)parents' southern residence (0/1)	0.386	-	0.400	-	**
Mental ability (ASVAB) (−3-3)	−0.222	(0.730)	−0.359	(0.661)	***
Rotter locus of control scale (6–14)	9.127	(2.380)	9.176	(2.312)	*
Delinquency (0/1)	0.750	-	0.843	-	**
Maternal covariates, child age 0					
Age	21.315	(2.816)	22.128	(3.097)	**
Number of children	1.751	(1.152)	1.706	(1.060)	
Marital or cohabitating partner (0/1)	0.676	-	0.519	-	***
High school completion (0/1)	0.737	-	0.776	-	
College completion (0/1)	0.028	-	0.005	-	***
Region (0/1)	0.430	-	0.351	-	
Employer tenure (weeks)	12.099	(19.081)	10.447	(17.299)	**
Full-time employment (0/1)	0.997	-	0.986	-	
Manufacturing worker (0/1)	0.126	-	0.118	-	**
Trade worker (0/1)	0.157	-	0.164	-	
Maternal covariates, child age 6					
Age	27.315	(2.816)	28.128	(3.097)	**
Number of children	2.451	(1.206)	2.395	(0.939)	
Marital or cohabitating partner (0/1)	0.606	-	0.409	-	***
High school completion (0/1)	0.776	-	0.792	-	
College completion (0/1)	0.039	-	0.005	-	***

	Mother not displaced child age 0–17		Mother displaced child age 0–17		t-tests
	Mean/Prop.	**(SD)**	**Mean/Prop.**	**(SD)**	
Region (0/1)	0.413	-	0.368	-	
Employer tenure (weeks)	21.514	(31.264)	17.980	(26.842)	***
Full-time employment (0/1)	0.996	-	0.994	-	
Manufacturing worker (0/1)	0.124	-	0.199	-	***
Trade worker (0/1)	0.175	-	0.231	-	
Maternal covariates, child age 12					
Age	33.315	(2.816)	34.128	(3.097)	**
Number of children	2.756	(1.245)	2.644	(1.036)	
Marital or cohabitating partner (0/1)	0.599	-	0.399	-	***
High school completion (0/1)	0.826	-	0.824	-	
College completion (0/1)	0.054	-	0.029	-	***
Region (0/1)	0.404	-	0.365	-	
Employer tenure (weeks)	36.838	(47.026)	24.581	(31.872)	***
Full-time employment (0/1)	0.822	-	0.834	-	†
Manufacturing worker (0/1)	0.119	-	0.147	-	***
Trade worker (0/1)	0.175	-	0.251	-	***
Child covariate					
Age in 2010	27.348	(2.377)	27.092	(2.331)	
Child outcomes in young adulthood					
High school completion (0/1)	0.760	-	0.743	-	*
Some college attendance (0/1)	0.427	-	0.350	-	***
College completion (0/1)	0.169	-	0.149	-	**
CESD age 20–24 (0–1)	0.231	-	0.298	-	*
CESD age 25–29 (0–1)	0.208	-	0.254	-	**
Weighted Sample Proportion	0.86		0.14		

Notes: Sample restricted to children whose mothers were not continuously married and living with their spouse, for whom we have data on job separation, and for children who were at least 19 years old in 2010 (n=5,697). Statistics weighted with an NLSY panel weight. For high school completion by age 19, n=4,412; for college attendance by age 22, n=3,993; for college completion by age 25, n=2,817; for depressive symptoms age 20–24, n=3,897; and for depressive symptoms age 25–29, n=3,192. Sample sizes differ according to missing values and different age thresholds for each dependent variable.

† p<.10

* $p < .05$

** $p < .01$

*** $p < .001$

Table 2

Logit Regression Estimates of Maternal Job Displacement During Childhood on Pre-Dispalcement Covariates

Maternal time-invariant covariates	
Black (0/1)	0.441 *** (0.110)
Hispanic (0/1)	0.235 (0.144)
(Grand)mother's years of education	−0.002 (0.017)
(Grand)parents' intact family age 14 (0/1)	−0.005 (0.089)
(Grand)parents' southern residence (0/1)	−0.023 (0.118)
Mental ability (ASVAB) (−3-3)	−0.384 *** (0.077)
Rotter locus of control (6–14)	0.017 (0.019)
Delinquency (0/1)	0.308 ** (0.106)
Maternal covariates, child age 0	
Age	−0.045 * (0.022)
Number of children	−0.031 (0.040)
Marital or cohabitating partner (0/1)	−0.481 *** (0.093)
High school completion (0/1)	0.371 ** (0.111)
College completion (0/1)	−2.728 ** (1.010)
Region (0/1)	−0.011 (0.112)
Employer tenure (weeks)	−0.005 * (0.002)
Full-time employment (0/1)	0.723 (0.743)
Manufacturing worker (0/1)	0.480 *** (0.138)
Trade worker (0/1)	0.044 (0.123)
Child covariate	
Child age in 2010	−0.041 * (0.020)
Constant	−1.310 (1.273)
$LR\ \chi^2$	166.46
$P > \chi^2$	0.000
n	5697

Notes: Numbers in parentheses are standard errors. Sample restricted to children whose mothers were not continuously married and living with their spouse, for whom we have data on job separation, and for children who were at least 19 years old in 2010.

† p<.10

* p < .05

** p < .01

*** p < .001 (two-tailed tests)

Table 3

Matching Estimates of Maternal Job Displacement During Childhood on Children's Outcomes in Young Adulthood

	Unmatched differences	Propensity score kernel matching, *TT*	Propensity score kernel matching, *TUT*
Socioeconomic Status			
High school completion	−0.053 **	−0.037 †	−0.052 *
binary 0/1	(0.021)	(0.022)	(0.024)
College attendance	−0.089 ***	−0.063 **	−0.099 ***
binary 0/1	(0.023)	(0.023)	(0.022)
College completion	−0.051 **	−0.036 *	−0.043 *
binary 0/1	(0.019)	(0.016)	(0.017)
Psychological Well-Being			
CESD age 20–24	0.018 †	0.014	0.022 *
scale range 0–1	(0.009)	(0.009)	(0.010)
CESD age 25–29	0.030 **	0.025 *	0.034 **
scale range 0–1	(0.011)	(0.011)	(0.012)

Notes: Numbers in parentheses are standard errors. Sample restricted to children whose mothers were not continuously married and living with their spouse, for whom

† p<.10

* p <.05

** p < .01

*** p < .001 (two-tailed tests)

Table 4

Matching Estimates of Heterogeneous Maternal Job Displacement on Children's Outcomes in Young Adulthood: Stratification Multilevel Method (SM-HTE)

	Level-1					Level-2
	Strata 1 ***p*** **= [0–.1)**	**Strata 2** ***p*** **= [.1–.15)**	**Strata 3** ***p*** **= [.15–.175)**	**Strata 4** ***p*** **= [.175–.2)**	**Strata 5** ***p*** **= [.2–1)**	**Trend**
Socioeconomic Status						
High school completion	−0.101 **	0.007	−0.094	−0.095	0.080	0.024
binary 0/1	(0.038)	(0.038)	(0.061)	(0.060)	(0.058)	(0.015)
College attendance	−0.132 **	−0.073 †	−0.022	−0.067	0.024	0.033 †
binary 0/1	(0.045)	(0.040)	(0.068)	(0.066)	(0.063)	(0.017)
College completion	−0.051	−0.023	0.022	−0.071	−0.038	−0.002
binary 0/1	(0.041)	(0.029)	(0.054)	(0.049)	(0.039)	(0.012)
Psychological Well-Being						
CESD age 20–24	0.043 *	−0.003	0.027	−0.001	0.005	−0.008
scale range 0–1	(0.017)	(0.016)	(0.025)	(0.025)	(0.025)	(0.007)
CESD age 25–29	0.051 **	0.024	0.029	0.012	−0.013	−0.014 †
scale range 0–1	(0.019)	(0.018)	(0.028)	(0.030)	(0.028)	(0.007)
N	2541	1778	597	379	402	5697

Notes: Numbers in parentheses are standard errors. Sample restricted to children whose mothers were not continuously married and living with their spouse, for whom we have data on job separation, and for children who were at least 19 years old in 2010. Maternal displacement is measured as displacement that occured when children were 0–17 years old. Propensity scores were estimated by a logit regression model of maternal displacement on the set of pre-displacement covariates.

† p<.10

* p <.05

** p < .01

*** p <.001 (two-tailed tests)

Table 5

Matching Estimates of Multistate Maternal Job Displacement on Children's Outcomes in Young Adulthood

	Mother displaced during recessionary period		Mother displaced during non-recessionary period		Mother displaced in LMA with high unemployment		Mother displaced in LMA without high unemployment	
	TT	***TUT***	***TT***	***TUT***	***TT***	***TUT***	***TT***	***TUT***
Socioeconomic Status								
High school completion	−0.075 *	−0.083 †	−0.037	−0.050 †	−0.092 †	−0.098 †	−0.024	−0.044 †
binary 0/1	(0.037)	(0.042)	(0.024)	(0.028)	(0.043)	(0.052)	(0.024)	(0.023)
College attendance	−0.056	−0.074 *	−0.070 **	−0.105 ***	−0.051	−0.079 †	−0.073 **	−0.105 **
binary 0/1	(0.039)	(0.037)	(0.025)	(0.023)	(0.045)	(0.043)	(0.025)	(0.034)
College completion	−0.061 *	−0.050	−0.035 *	−0.044 *	−0.008	−0.020	−0.049 **	−0.056 **
binary 0/1	(0.026)	(0.035)	(0.018)	(0.017)	(0.035)	(0.046)	(0.017)	(0.019)
Psychological Well-Being								
CESD age 20–24	0.005	0.016	0.019 †	0.022 *	0.002	0.006	0.020 †	0.028 *
scale range 0–1	(0.014)	(0.015)	(0.010)	(0.011)	(0.017)	(0.019)	(0.010)	(0.012)
CESD age 25–29	0.000	0.010	0.035 **	0.049 ***	0.006	0.024	0.031 *	0.041 **
scale range 0–1	(0.016)	(0.015)	(0.012)	(0.013)	(0.018)	(0.021)	(0.012)	(0.014)

Notes: Numbers in parentheses are standard errors. Sample restricted to children whose mothers were not continuously married and living with their spouse, for whom

† p<.10

* p <.05

** p < .01

*** p < .001 (two-tailed tests)

Table 6

Matching Estimates of Time-Varying Maternal Job Displacement on Children's Outcomes in Young Adulthood

	Mother displaced child age 0–5		Mother displaced child age 6–11		Mother displaced child age 12–17	
	TT	***TUT***	***TT***	***TUT***	***TT***	***TUT***
Socioeconomic Status						
High school completion	−0.004	−0.006	−0.016	−0.031	−0.115 **	−0.137 ***
binary 0/1	(0.037)	(0.044)	(0.032)	(0.033)	(0.040)	(0.037)
College attendance	−0.032	−0.070 †	−0.082 *	−0.085 *	−0.099 *	−0.108 **
binary 0/1	(0.042)	(0.036)	(0.034)	(0.036)	(0.039)	(0.041)
College completion	−0.035	−0.031	−0.027	−0.023	−0.052 †	−0.057
binary 0/1	(0.031)	(0.032)	(0.024)	(0.027)	(0.027)	(0.037)
Psychological Well-Being						
CESD age 20–24	0.003	0.009	0.013	0.013	0.031 *	0.040 *
scale range 0–1	(0.017)	(0.019)	(0.013)	(0.013)	(0.015)	(0.016)
CESD age 25–29	−0.021	−0.027	0.047 **	0.056 **	0.034 †	0.037
scale range 0–1	(0.016)	(0.017)	(0.017)	(0.021)	(0.019)	(0.024)

Notes: Numbers in parentheses are standard errors. Sample restricted to children whose mothers were not continuously married and living with their spouse, for whom we have data on job separation, and for children who were at least 19 years old in 2010. Propensity scores were estimated by a series of logit regression models of maternal displacement on the set of pre-displacement time-invariant and time-varying covariates. *TUT* standard errors were bootstrapped based on 50 replications.

† p<.10

* p <.05

** p < .01

*** p <.001 (two-tailed tests)

Table 7

Descriptive Statistics of Family and Socioeconomic Statuses of the Displaced

	Overall	Displacement Propensity					Displacement Context				Displacement Timing		
	Child age 0–17	*p* = [0–.1)	*p* = [.1–.15)	*p* = [.15–.175)	*p* = [.175–.2)	*p* = [.2–1)	Recession	Non-Recession	High Unemploy.	W/out High Unemploy.	Child age 0–5	Child age 6–11	Child age 12–17
A. Family Status													
Married													
Post-displacement (0–2 years)	0.129	0.228	0.153	0.066	0.047	0.032	0.083	0.146	0.177	0.113	0.237	0.077	0.070
Post-displacement (2–4 years)	0.166	0.221	0.191	0.132	0.141	0.064	0.124	0.171	0.221	0.147	0.251	0.146	0.083
Proportion throughout childhood	0.184	0.298	0.205	0.108	0.091	0.072	0.184	0.181	0.213	0.174	0.217	0.168	0.168
Partnered													
Pre-displacement (0–2 years)	0.169	0.304	0.186	0.118	0.082	0.021	0.124	0.181	0.114	0.188	0.161	0.173	0.173
Post-displacement (0–2 years)	0.182	0.316	0.181	0.105	0.129	0.064	0.161	0.175	0.152	0.192	0.137	0.211	0.192
Post-displacement (2–4 years)	0.134	0.202	0.135	0.079	0.106	0.086	0.150	0.132	0.095	0.147	0.109	0.138	0.160
Proportion throughout childhood	0.103	0.161	0.104	0.086	0.072	0.036	0.088	0.105	0.091	0.107	0.092	0.114	0.099
Number of relationship transitions	2.109	2.634	2.242	1.848	1.671	1.441	2.128	2.057	1.757	2.085	2.104	2.192	1.994
B. Socioeconomic Status													
Unemployment													
Post-displacement (0–2 years)	0.844	0.854	0.837	0.868	0.819	0.848	0.880	0.832	0.880	0.832	0.813	0.842	0.890
Post-displacement (2–4 years)	0.495	0.355	0.598	0.547	0.374	0.565	0.479	0.497	0.456	0.508	0.525	0.494	0.454
Proportion throughout childhood	0.408	0.338	0.407	0.451	0.425	0.484	0.395	0.419	0.397	0.411	0.342	0.444	0.432
Welfare													
Pre-displacement (0–2 years)	0.506	0.331	0.493	0.676	0.712	0.516	0.432	0.546	0.538	0.494	0.500	0.537	0.460
Post-displacement (0–2 years)	0.555	0.446	0.546	0.640	0.658	0.604	0.495	0.582	0.590	0.543	0.512	0.607	0.527
Post-displacement (2–4 years)	0.482	0.374	0.483	0.575	0.500	0.571	0.449	0.503	0.490	0.479	0.458	0.524	0.443
Proportion throughout childhood	0.368	0.272	0.347	0.442	0.442	0.465	0.337	0.387	0.364	0.369	0.292	0.404	0.404
Wages													
Pre-displacement (0–2 years)	6.302	8.841	6.182	4.961	4.839	5.028	8.053	5.591	6.051	6.389	5.058	5.409	9.472
Post-displacement (0–2 years)	2.095	1.840	2.420	1.724	2.197	1.990	1.889	2.184	1.610	2.260	2.313	2.033	1.907
Post-displacement (2–4 years)	5.779	7.118	4.916	5.507	6.470	5.089	6.390	5.737	6.775	5.434	5.384	5.542	6.746

Notes: Sample restricted to children whose mothers were not continuously married and living with their spouse, for whom we have data on job separation, and for children who were at least 19 years old in 2010 (n=5,697).