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Short-run effects of parental job loss on children's academic achievement

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ABSTRACT

We study the relationship between parental job loss and children's academic achievement using data on job loss and grade retention from the 1996, 2001, and 2004 panels of the Survey of Income and Program Participation. We find that a parental job loss increases the probability of children's grade retention by 0.8 percentage points, or around 15%. After conditioning on child fixed effects, there is no evidence of significantly increased grade retention *prior* to the job loss, suggesting a causal link running from the parental employment shock to children's academic difficulties.

Children's success in school and, ultimately, in the labor market and beyond, depends on the investments that children, parents, teachers, and others make in children's human and social capital. Many education-related policies in the United States focus on increasing resources to or affecting the mix of inputs used by schools. While schools are a natural focus for policy efforts, factors external to the schools, including social and economic circumstances and dynamics at home, are likely to have important effects on academic achievement. This paper investigates the relationship between a major economic shock experienced by many families—involuntary job loss—and the academic achievement of children.

The negative consequences of involuntary job loss on adults have been extensively documented. Earnings are permanently lowered by 10–25% (Jacobson, Lalonde, & Sullivan, 1993; Ruhm, 1991; Stevens, 1997). Health of adult job losers may also be dramatically affected; Sullivan and von Wachter (2009) show substantial increases in mortality among those who have lost their jobs in plant closings. Charles and Stephens (2004) show that marriage and family structure may be affected by some types of job loss. Given the dramatic effects on adults experiencing job loss, it seems likely that the negative impact could spread to their children. Recently, some intergenerational effects of job loss on children in the affected families have been documented. Oreopoulos, Page, and Stevens (2008) show that children whose fathers experienced job losses when they were adolescents have dramatically reduced earnings as adults. In contrast to this evidence of long-run, intergenerational effects of job loss, there is relatively little evidence of immediate, or short-run, effects of parental job loss on children. Kalil and Ziol-Guest (2008) study involuntary job changes in the U.S. and show some negative effects on children in the short-run. Their findings are limited however, by concerns about the exogeneity of the job separations considered. We expand this work by using a narrower definition of involuntary job changes, by conducting placebo tests to demonstrate that the observed changes in grade repetition are likely to be caused by the job losses, and by pooling multiple panels to increase the sample size by a factor of three.

This paper begins by asking whether there are substantial short-run effects of job loss on children's educational

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outcomes. While it is possible that the impact of job loss would be minimal in the short-run and develop over time as human capital investments deteriorate, evidence of short-run effects would lay the groundwork for the development of longer-run effects. A number of related questions are also asked. First, are patterns in the short-run effects consistent with what is known about the patterns of longer-run effects? For example, are effects concentrated among those children with initially low levels of income, or other underlying sources of disadvantage? Second, are the short-term effects of job loss consistent with the accompanying income shock as the underlying mechanism? If not, can other mechanisms be identified that translate the job losses to effects on children's achievement? Finally, are the effects of job loss confined to those families who are directly affected by job separations, or are such effects simply proxies for the broader deterioration of local labor markets? This final question is important since it could be that some of the short- or long-term effects reflect growing up in economically depressed areas, rather than direct effects of income or other shocks to individual families.

A more detailed understanding of the connection between involuntary job loss, parental income, and children's academic achievement is important for a number of reasons. First, as researchers continue to document consequences of job loss beyond earnings effects, a solid understanding of the immediate effects on the next generation is crucial both to understanding later effects on families and children, and to considering appropriate policy responses. Second, if job loss does produce substantial short-run effects on children's educational outcomes, there may be reasons to consider the local economic environment in evaluating the relative success of schools across regions and over time. A growing focus on school performance measures with punitive policy responses makes understanding how external factors affect student performance increasingly important.

We utilize data from the Survey of Income and Program Participation (SIPP) collected from 1996 to 2006 to examine the relationship between parental job loss and children's academic difficulties. SIPP consists of a series of short panel datasets, covering between 14,000 and 46,000 households per panel, and following them for 2–4 years each. Given that job loss from business closings or layoffs is a relatively rare event, it is important to have as large a sample size as possible for such a study. By combining data from three SIPP panels, started in 1996, 2001, and 2004, we are able to generate a reasonably large sample of children and their families.

Our results show that a parental job loss increases the probability that a child repeats a grade in school by nearly 1 percentage point per year, or roughly 15%. These results use child fixed effects to control for a child's underlying propensity to repeat a grade. If we view grade repetition as a signal of academic difficulties, these short-run effects may be consistent with findings of longer-term negative outcomes in education and earnings. Placebo tests for effects on grade retention prior to the displacement confirm the causal nature of these effects. Finally, results are robust to controls for state-level unemployment. Higher unemployment rates in a child's state of residence also increase the likelihood of academic difficulties, but controlling for this does not alter the point estimate of the effect of individual parental job losses.

1. Previous literature

Much of the motivation for this study comes from an emerging literature that documents long-term effects on children whose fathers who have lost jobs in the past. Oreopoulos et al. (2008) study a sample of Canadian families, some of whom experience job loss due to plant or business closings, and show that sons whose fathers lost their jobs (when the sons were ages 11–14) have earnings as adults that are reduced by approximately 9%. Most of this effect is concentrated among those whose family income prior to the job losses was in the bottom quartile of the income distribution. Similarly, Coelli (2005) shows that low-income teenagers whose parents experience job loss are less likely to attend college. Given evidence of fairly large effects on young adults, even many years after the parental job losses, it is surprising that there is little robust evidence of immediate effects on younger children.

Rege, Telle, and Votruba (2008) focused on shorter-term effects of parental job loss on children in Norway. They use a sample of tenth graders and look at those whose parents have been affected by a plant closing. They find significant negative effects of fathers' plant closings on the grade-point averages of graduating tenth graders, but only for those families living in non-booming areas (defined as having an unemployment rate in excess of 3%).

Kalil and Ziol-Guest (2008) use the 1996 SIPP panel to examine the link between employment patterns of parents and two academic outcomes of children: grade repetition and expulsion. Kalil and Ziol-Guest find statistically significant effects of involuntary job changes on the probability that children repeat grades and that they face expulsion. These effects are driven by the subset of households in which the mother is the primary breadwinner, leading the authors to conclude that "the adverse impacts of involuntary employment separations in two-parent families have less to do with income losses than with family dynamics." One concern with this conclusion, however, is that the coefficients on involuntary job gaps for mother-versus father-breadwinner families are not statistically different from one another.

While we also use SIPP data to examine the effects of parental job loss on children, our study differs from that by Kalil and Ziol-Guest in several important ways. The primary challenge to empirical work in this area involves distinguishing between true effects of job loss and correlations between unobservable factors that are related to both job loss and children's academic achievement. Two departures from the earlier study enhance our ability to make this distinction. First, we limit our definition of job losses to those that reflect permanent separations from employers that can plausibly be driven by labor demand conditions, and not by factors specific to an individual employee. Kalil and Ziol-Guest define their involuntary job changes to include separations and non-employment that are related to being "unable to find work," illness, and injury, among other reasons. We use a more conservative definition of job loss, as

detailed in Section 2. Second, even with this narrower definition, it is possible that unobservables will play a role, and so we make use of detailed information on the timing of both job losses and grade retention to test for spurious effects. Specifically, we show that, in the year prior to a parental job loss, there is no statistically significant increase in children's grade retention, and that the effects on children occur only after the job loss.[1] While Rege et al. (2008) also have a sample of plant closings that are more likely (relative to Kalil and Ziol-Guest) to be exogenous with respect to family-level outcomes, they do not make use of any pre-displacement children's outcomes for a similar placebo test.

2. Survey of income and program participation data

The data for this analysis are from the 1996, 2001, and 2004 panels of the Survey of Income and Program Participation (SIPP). The SIPP, which is maintained by the United States Bureau of the Census, is a longitudinal survey that provides information on the labor force status, income, and demographic characteristics of large representative samples of the non-institutionalized population of the United States. Within each panel, SIPP participants are interviewed at 4-month intervals, and are asked to recall income and labor force information for each of the last 4 months. Questions regarding children's academic outcomes, including their current grade and whether they have repeated a grade, are asked once or twice in each panel, as part of a topical module on child well-being. The 1996 panels consists of 12 survey waves, of which two (waves 6 and 12) include the relevant topical module. The 2001 panel includes 9 total waves. However, information about children's academic outcomes is provided only in wave 7, which prevents the analysis of our outcome of interest in subsequent waves. The 2004 panel consists of 8 total waves, with the topical module included in waves 3 and 8.

We begin with a sample of approximately 54,000 children after combining the three panels. Individuals that are non-responders in the waves that include the topical modules are dropped from the sample. Two-parent households with missing data on the father's job changes, income, or other characteristics are also dropped, as are single-parent households with missing data on the parent. The sample is limited to children between the ages of 5 and 19. Children younger than age 5 are excluded because they have not yet had the opportunity to repeat a grade. We include those up to age 19 at the end of the panel as long as they report information on prior grade repetitions at the time of the topical module, since they would have been in school at some point in the panel.

For our analysis we collapse the dataset from one of person-wave observations to one of person-academic year observations. This is because our main outcome of interest is grade repetition, which can vary only once per academic year. Because the SIPP panels are between 2 and 4 years long, we observe each child in our sample in 3–5 academic years. After collapsing on academic year we have 167,449 child-year observations.

Information on parents' job market outcomes, income, education, and demographic characteristics are also available for each child in the dataset. The treatment group consists of children whose father (or mother in the case of single-mother households) experienced an involuntary job loss after wave one of each panel. In each wave, respondents whose job ended during the reference period are asked the main reason they stopped working for their employer. In order to isolate job losses due to changes in the economic situation of the employer or industry, a job loss is defined as involuntary if: (i) the person was fired or discharged, (ii) if the employer was sold or went bankrupt, or (iii) if the job loss was due to slack work or business conditions. Because the first of these could include individuals fired for cause, or for low productivity that might be correlated with their children's academic success, we also estimate specifications including only the second and third reasons for the job loss in our definition of displacement. We drop households in which the head reports a displacement prior to the first interview of each panel, as it is impossible to determine the timing of the job loss when it is reported in wave one, and because it is not possible to control for pre-displacement family or child characteristics for these cases. Information about self-employment is treated separately from information on jobs worked for an employer in the SIPP, so changes in own business income or self-employment status are not identified as job losses in our analysis. In total, we have data on 1196 job losses affecting 2170 children.

Our focus on grade repetition is driven both by data limitations and by our interest in a meaningful short-run indicator of academic difficulties. The literature on grade retention shows that retention is correlated with a number of additional indicators of academic difficulties. For example, McCoy and Reynolds (1994) show that grade retention is predicted by both GPA and standardized test scores. Holmes and Matthews (1984) review a number of studies of the correlates of grade retention and find that it is associated with lower achievement in terms of test scores, behaviors and other outcomes. The fact that grade retention is correlated with many of these other outcomes suggests that it may be useful as an indicator of other academic difficulties.

Much of the recent literature on grade retention attempts to evaluate the consequences of grade retention in terms of later student outcomes. This literature includes evidence of both positive (Eide and Showalter (2001)) and negative (Jacob & Lefgren, 2009) effects of grade repetition, once the endogeneity of grade retention is considered.[2] What these, and other, studies have in common, however, is their view of grade retention as a signal of academic

[1] Kalil and Ziol-Guest focus on the correlation between job losses and grade repetition between waves 6 and 12 of the 1996 SIPP panel. Given this, some of the grade repetitions they identify may precede the parental job losses, and their approach does not allow for any specification checks based on the timing of the job loss.

[2] Babcock and Bedard (2010), also find small positive effects in cohorts with higher rates of grade retention, suggesting that there could be positive effects on the *non-retained* children in those cohorts.

weakness.[3] For our purposes, this is the most important point, since we use grade retention as a short-term indicator that the child is struggling academically.

We also focus on grade retention because, unlike many of the other outcomes available in the SIPP topical modules, it is possible to identify the timing of an initial grade repetition across the SIPP survey waves. In each of the topical modules, a "designated parent" (usually the mother) is asked whether their child has repeated a grade, and if so, which grade was repeated. In the sample, 4734 children are reported to have repeated at least one grade. Parents also report which grade the child is currently attending. Using a child's reported current grade in the first topical module combined with information on which grade(s) the child has repeated, we pinpoint the survey wave in which the first grade repetition occurs and generate an indicator variable that is equal to 0 if a child has never repeated a grade, and equal to 1 when the first grade repetition occurs (which remains equal to 1 in subsequent waves).[4] A related advantage of grade retention is that it can be applied to the full range of school age children, and can potentially occur in any year of primary or secondary education. This means we can include the full age range of school-aged children in our analysis.

In two of the SIPP panels, we have information on grades repeated from two different waves in which the topical module on child well-being was included. Examination of the multiple reports for the family shows many inconsistencies. In particular, many individuals report that a child has repeated some grade the first time the question is asked, but deny any grade repetition in the second round. Around 40% of individuals who report their child has repeated a grade the first time they are asked deny any repetition at the next topical module, a year or two later. Our interpretation is that many individuals simply do not repeat information that they have provided at an earlier wave, even though the survey question does not explicitly limit the time frame about which they are asked. Individuals are asked which grade was repeated, and we use this information to construct the timing of the event. Among those individuals who do report grade repetition both times the question is asked, responses concerning which grade was repeated are generally consistent.

Other controls come from the main SIPP waves including family income and earnings, industry of employment, state of residence, and the age, education, and gender of each household member. Throughout the analysis we use the SIPP family-level weights, though this makes very little difference to our estimates.[5]

[3] See Corman (2003) and Eide and Showalter (2001) for a discussion of why children are retained in a grade, including a cost-benefit framework in which the benefits are likely to exceed the costs for "children who are struggling with academics or who are immature." (Corman, 2003).

[4] For the 1996 and 2001 SIPP panels, similar information, including the timing of the event is available for a set of variables relating to whether the child has even been expelled or suspended from school. We have not used these variables here because they are suppressed in the 2004 file due to confidentiality concerns.

[5] Some SIPP panels, including the 1996 panel used in this analysis, oversample low-income individuals, so that use of the weights is necessary to make the samples representative of the overall U.S. population.

3. Empirical approach

Consider a simple model that predicts children's academic achievement as a function of their own, family, and school characteristics. Specifically, the level of academic success (to be proxied with an indicator for having ever repeated a grade) for child i at time t is given by:

$$A_{it} = \alpha_i + \beta_1 X_{it} + \beta_2 X_i' + \rho AGE_{it} + \varepsilon_{it} \quad (1)$$

Children's academic achievement (A) is a function of their own unobserved ability (including both cognitive and non-cognitive skill), α, which may also contain a component common to all members of the family. Observable determinants of academic success can be divided into time-varying (X) and fixed (X') characteristics of families, schools, and children. Key time-varying observable characteristics of the child's family include parental investments of both financial resources and time. Specific examples include year-specific family income (particularly in the presence of imperfect credit markets), family structure, school resources and quality, and the quantity and quality of parental time inputs devoted to that child in a given year. Additionally, there will be non-time varying, potentially observable, characteristics of the child that will affect academic achievement. Parents' completed levels of education may, for example, affect children's academic achievement (see Black, Devereux, and Salvanes (2005), and Oreopoulos, Page, and Stevens (2006) for studies of the causal effect of parental education on student's educational achievement). Permanent income should also affect children's educational achievement, above and beyond transitory income movements. Because the probability of ever having faced academic difficulty necessarily increases with age, academic success as measured here will also depend on a vector of child's age dummies.

Given the relationship summarized by equation one above, why should we expect parental job loss to affect children's probability of grade repetition? Any variables above that are potentially affected by job loss provide a mechanism by which job loss might translate to effects on children's academic outcomes. In particular, it is well documented that job loss results in substantial reductions in earnings in the short-run, with much of this initial reduction persisting into the medium to long-run. Thus, parental job loss will have effects on both transitory and longer-run family income. In this sense, job loss is likely to alter financial resources available for and investments in children, lowering their academic achievement. Additionally, in the short run, there may be changes in the quantity and quality of time parents spend with their children. The period of unemployment following an involuntary job separation could increase the quantity of time parents spend with their children. It is possible that additional time available to spend with children could decrease the likelihood of academic problems. More likely, however, the stress associated with the uncertainty of unemployment, or the need to devote more than a standard full-time workweek to job search, could reduce the quality and/or quantity of parental time devoted to children. Thus, to capture the effect of job loss on children's outcomes, consider the following

reduced form relationship between the two:

$$A_{it} = \alpha_i + \beta X^*_{it} + \gamma D_{it} + \rho AGE_{it} + \varepsilon_{it} \quad (2)$$

D_{it} is a vector of dummy variables indicating a displacement in the current or a prior year. Here, the vector of controls, X^*, is modified to include only those characteristics that are measured prior to job loss, or are not affected by the job loss itself.

Both equations above make clear that a child's individual, fixed ability will affect their probability of academic success. If parents are non-randomly selected into displacement, and abilities are correlated across generations, failure to control for children's unobserved ability (which will be correlated with parental ability) will lead to biased coefficients on the job loss variables. We follow a standard approach to this problem and use models that control for child-specific fixed-effects. Including fixed effects also means that any additional controls in X that do not vary over time will drop out of the estimating equation. For example, the level of school resources or school quality (assuming they are approximately fixed over the short time periods in our sample) in a community will also be controlled for by including the fixed effect.[6] Similarly, the fixed effect will control for the permanent component of family income that may affect children's academic success.

It is also possible that a child's academic ability will evolve over time in ways that are related to unobservable characteristics of the child or the family. In particular, suppose that children's academic achievement is better modeled as:

$$A_{it} = \alpha_i + \delta_i t + \beta X^*_{it} + \gamma D_{it} + \rho AGE_{it} + \varepsilon_{it}, \quad (3)$$

In this case, fixed-effects estimates (controlling for α_i) may continue to be biased by child-specific unobservables. Given the short length of our panels, it is difficult to directly control for the δ_i term, but we can come close by using baseline indicators of academic achievement (and other observables) interacted with a time trend. That is, suppose we can model the individual-specific trend term as:

$$\delta_i = G(\theta Z_{oi}) \quad (4)$$

where Z is a baseline measure (at time 0) of observable characteristics of the child or family, and θ is a vector of coefficients that relate these observables to the individual specific achievement level. An obvious candidate for an observable that might be correlated with the individual-specific trend is whether the child has repeated a grade prior to the initial survey wave. To get additional predictive power, we can also make use of grade retention information for all siblings in the family as of the initial survey wave. Because we are concerned primarily with unobserved factors that could be correlated with parental or family-level ability measures, incorporating all siblings' baseline grade repetition measures should better control for family-level unobserved ability. Thus, an additional specification that we estimate (from substituting (4) into (3)) is

$$A_{it} = \alpha_i + \theta Z_{0i} t + \beta X^*_{it} + \gamma D_{it} + \rho AGE_{it} + \varepsilon_{it} \quad (5)$$

where Z includes the average grade repetition count over all siblings at the beginning of the survey (and prior to any observed displacements). In some specifications we also include children's age, race, gender, and parental education in Z.

4. Results

4.1. Overall effects of parental displacement

Summary statistics for our sample are shown in Table 1. The sample includes 51,098 children whose parents do not experience a displacement, and more than 2000 children whose parents are displaced some time after wave 1. To summarize children's characteristics at the beginning and end of our sample period, we divide the sample into two groups of children: those whose parents experience a job loss sometime after the initial SIPP wave in which their family is interviewed, and those whose parents do not experience a job loss. Recall that individuals reporting a job loss in the initial wave are dropped from the sample. In the initial survey wave, average real monthly income, in 2004 dollars, is approximately $5300 among those never displaced, but only $3600 among those who will eventually be displaced. Clearly, job loss is correlated with initial family income in this sample. Similarly, initial earnings of those who are not displaced are roughly $4900, compared to only $3200 among those who will later be displaced. Other characteristics also differ across the displaced and not displaced groups, with those whose parents will be displaced consistently showing lower socioeconomic status. Forty-one percent of fathers and 43% of mothers in the non-displaced sample have a high school education or less, while 54–55% of the parents in the displaced sample have this level of education. Children of displaced individuals are also less likely to live with two parents at the beginning of the survey (63%), compared to those whose parents are not displaced (73%).

The relative disadvantage of the displaced sample, even prior to displacement, is also apparent in the main outcome variable of interest, grade repetition. At the time of the initial survey wave, 5.4% of children in the non-displaced group, and 6.8% of the (eventually) displaced group have already repeated a grade. It is also the case, however, that the gap (between displaced and not) in grade repetition grows over the course of the survey waves. By the final wave of the survey period, just over 7% of the children without a parental displacement have repeated grades, but more than 9% of those with a displacement have repeated grades. Children with displaced parents have a larger increase in the probability of repeating a grade in absolute terms (2.4 percentage points versus 1.7 percentage point), but only a slightly larger increase in percentage terms. The table of means make clear that it is important to fully control for the many differences in both observable and unobservable characteristics that may be correlated

[6] Any time-varying component of school quality not controlled for in this approach will only be a source of bias if it is correlated with an individual parent's job loss. One way this could arise is if the job loss is part of a broad economic decline in the local area. Section 4.4 considers this and suggests that it is not a problem here.

Table 1
Summary statistics.

	Head never displaced		Head displaced after wave 1	
	Initial wave	Final wave	Initial wave	Final wave
Child has repeated a grade	0.054	0.071	0.068	0.092
Monthly family income ($2004)	5306	5498	3593	3677
Monthly family earnings ($2004)	4929	5120	3245	3269
Child's age	9.75	12.05	9.02	11.40
Male	0.51		0.50	
White	0.79		0.74	
Black	0.14		0.19	
Father high school or less	0.41		0.54	
Mother high school or less	0.43		0.55	
Two parents in household	0.73		0.63	
N (children)	51,098		2170	

Note: Data are from 1996, 2001, and 2004 SIPP panels, including topical modules on children's well-being. Data are collapsed to one observation per child-academic year.

Table 2
Effects of parental job loss on probability child repeats a grade.

Estimation by: Head's job loss	OLS (1)	Child FE (2)	Child FE (3)	Child FE (4)	Child FE (5)
Current year	0.010 (0.009)	0.003 (0.004)	0.004 (0.005)	0.003 (0.005)	0.003 (0.005)
One or more years prior	0.017 (0.009)	0.008 (0.004)	0.010 (0.004)	0.010 (0.004)	0.009 (0.004)
Initial family repeats*trend	No	No	No	Yes	Yes
Family demographics*trend	No	No	No	No	Yes
N=	167,449	167,449	131,786	131,786	131,786

Note: Data are from 1996, 2001, and 2004 SIPP panels, including topical modules on children's well-being. Coefficients from linear probability models for child having repeated a grade, including child fixed effects, child age dummies, state of residence and panel by wave dummies. Data are collapsed to one observation per child-academic year. Standard errors clustered on family identifiers.

with the probability of job loss and the probability of grade repetition.

Table 1 also hints at the income and earnings effects that typically accompany job loss. Among the displaced, income and earnings are essentially flat. Among the not displaced, there is some slight growth, with monthly income increasing by about $200, or around 4%.

Table 2 shows the first set of regression results, relating children's grade repetition to family background characteristics and indicators for a recent job loss by the head of the household, using a linear probability model. For simplicity, in the basic specification, we control for job loss of the head of household. The head of household is assumed to be the male in two parent households. Thus, we are looking at the effects of job loss of the husband in two parent families, and of the sole parent, almost always the mother, in single parent families. Below, we show results that disaggregate by family structure. The regressions, in addition to the coefficients highlighted in the tables, include dummy variables for the panel year interacted with the survey wave, and child's age in years.

To see whether it is important to control for child-specific fixed effects, we begin, in column one, with an OLS specification that includes controls for child's gender and race and parent's education, but does not control for fixed effects.[7] It is worth noting some sizeable differences in the likelihood of grade repetition across different demographic groups implied by the OLS coefficients. Children of parents with higher levels of education are less likely to repeat a grade. This may reflect a combination of a causal effect of parental education on children's academic success and correlation across generations in unobserved academic ability.[8] Girls are three percentage points less likely to repeat a grade than boys in a given year; black children are roughly three percentage points more likely to repeat a grade than children of other races.

Given the substantial differences, even prior to any displacement, in parental income and characteristics of those who do and do not later experience a job loss, it is unlikely that job loss in the OLS specification can be considered exogenous. In this specification, a parental job loss 1 year ago is predicted to increase the child's probability of repeating a grade by 1.7 percentage points, a very large effect considering that the sample average is only 0.055. We also include a variable indicating that a job loss has occurred in the current academic year. Children are not coded as repeating a grade until the second time the grade is attempted. Thus, it is only the coefficient for job loss one or more years ago that can possibly reflect causal effects of parental job loss on children's academic outcomes. Although the coefficient for job loss in the current year (in column one) is not statistically significant, it is relatively large, indicating that the OLS specification may not adequately control for unobservables that are correlated with academic achievement and parental job loss.

[7] We have also estimated OLS models controlling for parental income levels prior to the job loss and obtain very similar results.

[8] Oreopoulos et al. (2006) find that higher parental education reduces children's likelihood of grade repetition, using an instrumental variables strategy based on parental exposure to compulsory schooling laws.

In column two of Table 2 we show results from estimation of a model including child-specific fixed effects. This substantially reduces the estimated effect of parental job loss on grade repetition, although the effect of prior job losses remains positive and statistically significant. Once we include the child fixed effects, the coefficient on job loss in the current year is much smaller and statistically insignificant. The coefficient of interest, in contrast, for a displacement in a prior year, suggests that job loss by the head of the family increases the probability of grade retention by 0.8 percentage points, or approximately 15%.

While the lack of any significant coefficients on job loss in the current year suggests that the effects of job loss we are picking up are causal, it is still possible that correlation between the underlying abilities of parents and children could lead to bias on the estimated job loss coefficients. In particular, if the individual-specific component that determines educational attainment evolves over time, the model in (3) will be relevant and our estimates of the displacement effect may still reflect unobserved family traits.

Columns three through five of Table 2 present our estimates when we also control for an individual-specific trend in academic achievement. We proxy the individual-specific term with the family-wide experience of grade retention as of the initial survey year (interacted with a trend). Because this approach requires both the child's own grade repetition and that of all the child's siblings, we restrict the sample for this specification to families with at least two children. This produces very similar, but slightly larger estimates of the effect of job loss on grade repetition (column three). In column four, we add siblings' average grade retention as of the beginning of the survey interacted with a time trend as an additional control. The coefficient on family-wide grade repetition interacted with a trend (not shown in table) is positive and statistically significant, suggesting that individual's grade retention probabilities do evolve over time. The estimated coefficients on parental job loss, however, are unchanged. The final column adds child and parental demographic characteristics (education, race and gender) in the set of variables interacted with the time trend, and again produces similar results for the main coefficient on parental job loss.

We have also estimated these models with separate job loss indicators for job losses due to being "discharged or fired" and those for due to firm bankruptcies or poor business conditions. If job losses due to being fired are actually reflecting unobserved characteristics of the parents that are negatively affecting academic achievement, we would expect the effects of firings to be larger than those of firm bankruptcies or poor business conditions. Point estimates of the effect of job losses due to bankruptcies or poor business conditions are not statistically different from those for being discharged or fired, which is consistent with the firings being no less random than the job losses from firm closings. Unfortunately, this divides our samples of job losses into roughly two equally sized groups, and neither of the job loss by reason coefficients are individually statistically significant. While we do not have enough job losses from firm closings to estimate effects of these more clearly exogenous events separately, the consistent lack of effects in the year of job loss, and the robustness to controls for individual-specific trends both suggest that these effects are the result of job losses and not spurious effects of family characteristics.

4.2. Job loss, income loss, and effects on children

One of the well-documented effects of job loss is that earnings and family income are sharply and permanently reduced. While it is impossible to isolate the role of income loss in mediating the effects of job loss on children's academic achievement, in this section we explore patterns of results across subgroups that may shed light on the relative importance of income losses. To begin, Table 3 shows the effects of job loss on family income and family earnings (in both log and level forms). Note that income and earnings here are monthly measures, and are expressed in 2004 dollars. Family income (using the log specification) is reduced by approximately 10% in the years after job loss. The effect based on using earnings levels is roughly $290. Earnings are reduced by approximately 15% in the year after job loss.

These earnings reductions are somewhat smaller than previous estimates of the short-run effects of job loss. This may reflect the inclusion of a broad cross-section of workers, undoubtedly including many workers with relatively low pre-displacement job tenure. Many studies of displaced workers restrict their samples to those with substantial pre-displacement tenure, and thus find larger earnings effects. Results for family income correspond well with the findings of Oreopoulos et al. (2008), who report income reductions of approximately 12% in the short run. For the current study, these results are important because they confirm the shock to family income that accompanies job loss by the head of household, and may suggest a mechanism for the effects on children, either directly through the income loss, or as the result of stress associated with the income loss.

One pattern found in previous work that may be suggestive of an important role for income losses is that effects

Table 3
Effects of job loss on family income and earnings.

	Ln (family income)	Ln (family earnings)	Family income	Family earnings
Job loss in				
Current year	−0.0003 (0.025)	−0.0707 (0.033)	−209 (108)	−284 (110)
One or more years prior	−0.1086 (0.028)	−0.168 (0.033)	−291 (99)	−346 (97)
N=	166,786	158,740	167,449	167,449

Note: Data are from 1996, 2001, and 2004 SIPP panels. Coefficients from fixed-effects models for income or earnings including panel-wave dummies. Data are collapsed to one observation per child-academic year. Standard errors clustered on family identifiers.

Table 4
Effects of head's involuntary job loss on children's grade repetition and family income by family and child characteristics.

	Dependent variable: repeated grade	Dependent variable: Ln (family income)	Average family income	Average probability of repeating
Subgroup				
Family income > median	0.0121 (0.0069)	−0.2160 (0.0390)	8138	0.050
Family income < median	0.0025 (0.0045)	−0.1390 (0.0349)	2022	0.096
Family income 1st quartile	0.0039 (0.0060)	−0.1775 (0.0530)	1076	0.108
Head high school or less educa	0.0099 (0.0058)	−0.0930 (0.0358)	3425	0.094
Head some college or more	0.0026 (0.0039)	−0.1413 (0.0431)	6543	0.055
Single parent family (wave 1)	0.0009 (0.0053)	−0.2027 (0.0516)	2430	0.106
Two parent family (wave 1)	0.0106 (0.0051)	−0.0711 (0.0323)	6189	0.059

Note: Data are from 1996, 2001, and 2004 SIPP panels, including topical modules on children's well-being.
Coefficients from fixed effects models for grade repetition including panel-wave dummies.
Data are collapsed to one observation per child-academic year. Standard errors are clustered on family identifiers.

of parental job loss on children tend to be concentrated among relatively disadvantaged households. Oreopoulos et al. (2008), for example, show that most of the effect of parental job losses (from business closings in Canada) on their children's adult earnings is concentrated among those families who were in the bottom quartile of the earnings distribution even prior to displacement. This pattern is not confirmed in the current study, as Table 4 shows that children from families with income above the median (prior to the job loss) have a slightly larger than average increase in the probability of grade repetition of 1.2 percentage points. Estimated effects for children from families below the median are much smaller, although the large standard error means we cannot reject effects equal to the sample average among this group either.

Another way to relate the effects on academic achievement to the associated income shock is to compare the effects of job loss on grade repetition and on family income across subgroups. In the second column of Table 4, we show the size of the reduction in family income associated with the job loss in a previous year. Note that, while there is a larger percentage reduction in family income among those above the median (19%) than below (13%), the confidence intervals for these two effects on family income overlap. Further, if we look at the very bottom of the income distribution, among those families in the first quartile of family income, the effect on income is 17%. Thus, the differences in effects by family income appear mainly to reflect sampling variability, with no real pattern relating the size of effects on children to the size of either starting income, or the size of effects on family income.

Other work has also found larger impacts of job loss on children among relatively disadvantaged households, defining disadvantage in terms of demographic or educational indicators. Thus, the next sections of Table 4 stratify our sample by the education level and marital status of the household head. Again, there is no clear pattern of relationship between the level of socioeconomic advantage, the income losses from job loss, and the effects on academic achievement. We see a slightly larger than average effect on grade repetition among those households with less educated parents and very small point estimates for households with a college-educated head. There is a large point estimate for the effects on grade repetition among two-parent families, and a small estimate for single-parent households. Unfortunately, the confidence intervals around these estimates are simply too large to draw any strong conclusions.

4.3. Other potential mechanisms

The analysis in Table 4 was motivated by the assumption that at least part of the impact of displacement comes from the sizeable and lasting reductions in family income associated with job loss. There is little evidence here, however, connecting the size of the income shock to the magnitude of effects on academic achievement. Effects of job loss on other aspects of a child's home or family environment may also drive some of the associated academic difficulties. First, the increased likelihood of geographic mobility after job loss may increase children's likelihood of repeating a grade. Moving can be a stressful experience for children, particularly if it involves changing schools and making new friends. It is also possible that if a family relocates in the middle of a school year, a child may be required to repeat a grade in order to satisfy requirements at their new school. Major life events, such as residential relocation, that disrupt established routines and interfere with existing psychological supports and social networks are associated with increased psychological distress (McLanahan, 1983). Second, parental divorce or separation following a job loss may also influence childrens' academic achievement. Charles and Stephens (2004) find an increase in the probability of divorce following layoffs, and numerous studies document the detrimental effect of divorce on children's academic achievement and other outcomes (see Amato and Keith (1991) for a meta-analysis). Finally, even in families that do not relocate and remain intact, job loss and its associated stress might alter the amount and quality of time that parents spend with their children.

To investigate these effects we make use of a series of variables from the SIPP's main survey and from its topical modules on child well-being. Information on residential mobility and parents' marital status are taken from the main part of the SIPP panels. In the topical module, a child's primary caregiver, usually the mother, is asked to report the number of times in the past week they and the child's father have engaged in certain activities with the child. Variables we consider include the number of times a parent has read to the child and the number of times a parent has eaten dinner with the child.

Table 5
Effects of job loss on divorce, mobility, and parent time use.

	Dependent variable		
	Divorce	Relocation	Grade repetition
Job loss in			
Current year	0.0155 (0.005)	0.028 (0.016)	0.003 (0.004)
One or more years prior	0.0318 (0.010)	0.0752 (0.016)	0.009 (0.004)
Parents divorced in current year			0.002 (0.003)
Family moved in current year			0.005 (0.002)
Controls for divorce and residential moves	No	No	Yes
N=	150,596	150,596	150,596

Note: Data are from 1996, 2001, and 2004 SIPP panels, including topical modules on children's well-being. Coefficients from fixed-effects models for grade repetition including panel-wave dummies. Data are collapsed to one observation per child-academic year. Standard errors are clustered on family identifiers.

In Table 5, we report results from replacing the dependent variable in our main specification with the probabilities of divorcing or moving. We find that involuntary job loss increases the likelihood of divorce or separation in the short run by a statistically significant three percentage points.[9] Job loss increases the probability of relocation by 8 percentage points. Both the divorce and mobility results could play a role in the academic difficulties associated with job loss. We have also run regressions using the parental time use measures, including the number of times a parent reads to the child or has dinner with the child, as a dependent variable. These regressions produce no evidence that job loss alters parental time use. In the final column of Table 5, we show results from returning to the regression with grade repetition as the dependent variable, but also including controls for relocation and divorce. Children whose families have changed residences in the current year are more likely to repeat a grade, but this does not seem to be a major pathway for the effects of job loss, as the coefficient on displacement is very similar to our earlier estimates. Including additional terms for residential moves in earlier years produces similar results.

4.4. Individual job loss versus local labor markets

An alternative explanation for the effects of individual job loss on children's outcomes is that they reflect broader deterioration in local economic conditions. Separate from the literature focusing on the effects of individual job loss, several studies show that local (usually state) unemployment rates also have effects on adults and children in the community. For example, Ruhm (2000, 2007) has a number of studies establishing a link between state-level unemployment measures and mortality. Similarly, Dehejia and Lleras-Muney (2004) document the relationship between infant health and state unemployment rates. The focus of these studies is on aggregate movements in the economy and these studies typically do not include controls for individual-level labor market status or changes, raising the question of whether the state-level indicators might be proxies for the effects of individual-level employment disruptions.

Our final set of analyses adds state-level unemployment rate controls to the regressions along with individual job loss indicators, to see whether there are distinct effects of parental employment status and broader measures of economic conditions. These results are shown in Table 6. State-level unemployment rates are tabulated from Current Population Survey data. Like the indicators for individual job loss, we expect that negative economic conditions could result in negative effects on children for several years. To capture the effect of unemployment on children's grade retention for several years we have included both current and lagged unemployment rates. To summarize these effects, we show results based on the unemployment rate averaged over the current and previous 2 years.

The first column of Table 6 includes only the state-level unemployment rate 3-year average, without the individual job loss indicators. A 1 percentage point higher unemployment rate leads to a 0.3 percentage point increase in the probability that a child repeats a grade.[10] The next column adds the individual parental job loss variables to the grade repetition regressions. The coefficient on the individual displacement variables barely changes, suggesting that the individual displacement measure is capturing something beyond the area-level economic conditions. In addition, the coefficient on the state-level unemployment rate remains similar in magnitude and statistically significant, even after controlling for the parents' job loss status. Finally, we interact the state-level unemployment rate (averaged over all years) with the indicator for a recent displacement. The final column of Table 6 shows that effects of individual displacement are not significantly different across states with different levels of unemployment, and the point estimates suggest slightly larger effects in the low unemployment states. This contrasts with the results of Rege et al. (2008) who find that the negative impact of displacement on children occurs only in areas with high unemployment rates. The results in Table 6 confirm that there are effects on

[9] Previous work by Charles and Stephens (2004) find that separations due to layoffs lead to increases in divorce probabilities, but not those due to firm closings. Using our SIPP data, we find similar point estimates (both of which are statistically significant), indicating an increase of approximately 3 percentage points in the probability of divorce, regardless of whether we use our full sample of layoffs and business closings, or the restricted set of displacement due to business closings.

[10] Sample sizes differ slightly in this table because of some missing values for state of residence.

Table 6
Effects of individual job loss versus local labor market indicators on grade repetition.

Head displaced in prior year		0.007 (0.003)	
State UER last three years	0.003 (0.001)	0.003 (0.001)	
Head displaced in prior year: high UER state			0.005 (0.004)
Head displaced in prior year: low UER state			0.009 (0.005)
N=	166,333	166,333	166,333

Note: Data are from 1996, 2001, and 2004 SIPP panels, including topical modules on children's well-being. Coefficients from fixed-effects models for grade repetition including panel-wave dummies. Data are collapsed to one observation per child-academic year. Standard errors are clustered on family identifiers.

children of both individual parental employment shocks and broader economic conditions. The estimated effect of parental job loss on children's outcomes is not altered by inclusion of controls for state-wide economic conditions.

4.5. Interpreting magnitudes of job loss effects

Before concluding, we briefly consider the magnitude of effects estimated here and consider what these magnitudes may imply about the mechanisms at work. Our estimates for the overall sample suggest that a parent's job loss increases the probability that a child will repeat a grade by around 15%, and reduces family income by around 10%. An obvious question is whether all of these effects on kids could come about as the result of the income loss. As a baseline, consider the coefficient on income from an OLS regression of grade repetition on income and other factors, such as that shown in the first column of Table 2. The coefficient on income in this type of regression is often assumed to be upward biased due to omitted variables that are correlated with both family income and children's academic ability. The estimated coefficient on income from such a regression implies that a 10% reduction in income (the approximate income effect from job loss) would reduce grade repetition by 2–7%, substantially less than our estimated effect of displacement. This suggests that the effects of displacement are capturing something beyond direct linear effects of income. It may be that sharp, negative shocks to income have more dramatic effects than smaller, or positive, changes in income. Another possibility is that the stress induced in families following job loss is driven by particular conditions, such as uncertainty of income, that go beyond standard income effects. While these results are supportive of some role for income, or more specifically, income shocks, in affecting the outcomes of children, the major challenge of understanding precisely how these shocks translate to changes in outcomes remains.

5. Conclusion

The extent of disruption in the lives of adults from involuntary job loss has been widely documented in both academic studies and the popular press. Given this, it is surprising that there is relatively little evidence that job loss has immediate effects on the children of those who lose jobs. This study establishes that there are intergenerational effects of job loss on children's short-term academic achievement, using grade retention as a proxy for academic difficulties. We show that there are substantial short-run effects of parental job loss on children's probability of repeating a grade. There is no evidence of significantly increased grade retention in the years leading up to job loss, supporting our interpretation of the job loss as a causal factor in subsequent grade repetition. Our key finding is generated by models that include child fixed effects, and include natural placebo tests based on grade repetitions that occur simultaneously with the job loss.

The finding of immediate, sizeable effects of job displacement on children's grade retention suggests that more attention should be paid to the potential role of external factors in affecting school level outcomes. The fact that state-level unemployment rates also affect the likelihood of grade retention further supports this conclusion. Schools in areas with large concentrations of displaced workers or relatively cyclical employment may face particular challenges in maintaining achievement standards during times of economic hardship.

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