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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 roughly one percentage point, or 17 percent. After conditioning on child fixed effects, there is no evidence of increased grade retention prior to the job loss, suggesting a causal link between the parental employment shock and children's academic difficulties. These effects are concentrated among children whose parents have a high school education or less. No systematic pattern of effects is found with respect to pre-displacement parental income or wealth.

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Children's success in school and, ultimately, in the labor market and beyond, depend on the investments that their parents, teachers, and others make in children's human and social capital. Many public policies in the United States are devoted to promoting greater academic achievement, typically focusing on increasing resources or affecting the mix of inputs within the schools. While schools are a natural focus for policy efforts, factors external to the schools, including social and economic circumstances and dynamics within families, 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 their children.

The negative consequences of involuntary job loss on adults have been extensively documented. Earnings are permanently lowered by 10 to 25 percent (Jacobson, Lalonde and Sullivan (1993), Ruhm (1991), Stevens (1997)). Health of adult job losers may also be dramatically affected; Sullivan and von Wachter (2007) 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 potential negative impact could spread to their children. Recently, intergenerational effects of job loss on children in the affected families have been documented. Oreopoulos, Page, and Stevens (2008) show that adults whose fathers experienced job losses when they were adolescents have dramatically reduced earnings as adults. In contrast to this long-run effect of parental job loss on children, Kalil and Ziol-Guest (2008) find only limited evidence of effects on children in the period immediately following job loss. Our study builds on the previous literature and fills a gap by focusing on the short-run effects of job loss on children.

This paper is one part of a larger research agenda aimed at answering a number of related questions. First, to better understand the pathways by which job loss has such long-run intergenerational effects, can we document substantial short-run effects of job loss on children? While it is possible that the impact of job loss would be minimal in the short-run and develop over time as investments deteriorate, some short-run effects would lay the groundwork for the persistence of longer-run effects. Second, are patterns in the short-run effects consistent with

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? Third, are the short-term effects of job loss consistent with the income shock as the underlying mechanism? Fourth, are the effects of job loss confined to those families who are directly affected by job separations, or do they simply proxy for deterioration of local labor markets? This question is potentially important to understanding the mechanism of these effects, since it could be that some of the 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 outcomes is important for a number of reasons. First, more fully understanding the intergenerational consequences of job loss may help to design assistance policies for those affected. Second, if job loss does produce substantial short-run effects on children, 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 between 1996 and 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 to 4 years. Note that work by Kalil and Ziol-Guest (2008) above also used the SIPP data. Our data approach differs from theirs in that we combine 3 panels of the SIPP, while they utilize only the 1996 panel. Given that job loss from business closings or layoffs are relatively rare events, it is important to have as large a sample size as possible for such a study. By combining data from 3 SIPP panels, started in 1996, 2001, and 2004, we are able to generate a reasonably large sample of children and their families, each observed over two to three years.

Our results show that parental job loss increases the probability that a child repeats a grade in school by roughly 1 percentage point a year, or roughly 20 percent. 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. These effects on children's academic achievement are particularly large for families in which the parents have

only a high school education or less, with little evidence of any effect among children whose parents have completed some college.

I. Previous literature

Most closely related to our study is recent work by Kalil and Ziol-Guest (2008) who 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 some statistically significant effects of involuntary job changes on the probability that children repeat grades and that they face expulsion. These effects, however, appear to be limited to 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. By using multiple SIPP waves, and exploiting more of the across-wave timing of job losses and grade repetition, we hope to gain some statistical power to help identify these effects.

Another feature of our approach that stands in contrast to the Kalil and Ziol-Guest study is the definition of "involuntary job change" used in the two studies. Kalil and Ziol-Guest (2008) consider the parent to have an "involuntary job gap" if there is a job change or a period of non-employment between the third and seventh wave of the survey that the respondent attributes to: "unable to find work, on layoff, slack business or work conditions, injury, illness or disability, labor dispute, bad weather" and other non-specified reasons. Given that our interest is in identifying job separations that are arguably uncorrelated with individual productive or academic characteristics, we use a narrower range of involuntary job separations to better capture dismissals that are unrelated to these characteristics.

Oreopoulos, Page and Stevens (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 to 14) have earnings as adults that are reduced by approximately 9 percent. Most of the statistically significant effects on children found in this study are 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. Our study attempts to fill this gap in the literature.

II. 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 four month intervals, and are asked to recall income and labor force information for each of the last four 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 twelve survey waves, of which two (waves six and twelve) include the topical module. The 2001 panel includes nine total waves. However, information about children's academic outcomes is provided only in wave seven, which prevents the analysis of our outcome of interest in subsequent waves. The 2004 panel consists of eight total waves, with the topical module included in waves three and eight.

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 five and 19. Children younger than age five are excluded because they have not yet had the opportunity to repeat a grade, while older children are excluded because the outcome of interest does not apply to them. 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 two and four years long, we follow each child in our sample for between 3 and 4 academic years. After collapsing on academic year we have 183,222 child-year observations.

Information on parents' job market outcomes, income, education, and demographic characteristics are linked to each child in the dataset. The treatment group consists of children whose father (or mother in the case of single-mother households) experienced involuntary job loss after wave 1 of each panel. The short recall period of the SIPP is an advantage in that it allows for identification of the survey wave in which the first involuntary job loss occurred. 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 ability that might be correlated with their children's academic success, we also show some results 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 1, 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 1128 job losses affecting 2056 children.

Our focus on grade repetition is driven by both 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. It is also possible that grade repetition, in addition to signaling academic difficulties, serves as a remedy to short-run academic problems. The literature on the causal effects of grade repetition is far more limited but, if anything, suggests that grade repetition could have small, negative effects, especially on students in higher grades (Jacob and Lefgren, 2007). This suggests grade repetition may be a reasonable proxy for immediate academic difficulties that could carry over into longer-term effects.

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).

Other controls comes from the main SIPP waves including family income and earnings, industry of employment, state of residence, and the age, education, and gender of each households member. Throughout the analysis we use the SIPP family-level weights.

III. Empirical Approach:

Consider a simple model that predicts children's academic achievement as a function of their own and their family's background 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:

(1) $$A_{it} = \alpha_i + \beta_1 X_{it} + \beta_2 X_t' + \delta AGE_{it} + \varepsilon_{it}$$

Children's academic achievement (A) is a function of their own unobserved ability (including both cognitive and non-cognitive skill), α, which may 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 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 Page, Oreopoulos, 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 specification in equation 1 above, why should we expect parental job loss to affect children's 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 the financial resources 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:

(2) $A_{ict} = \alpha_i + \beta_1 X_{ict}' + \gamma D_{ict} + \delta AGE_{ict} + \varepsilon_{ict}$

Dit 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 potentially affected by the job loss itself. For example, in the basic specification with the indicator for job loss, we control only for income prior to a job loss, so that the displacement variable will capture potential effects on both permanent and transitory income of the family.

Both equations above make clear that a child's individual, fixed ability will affect their probability of academic success. If parents are potentially selected for job 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. Two approaches are used to address this concern: estimation of models including a child fixed-effect, and estimation of models which condition on a child's baseline (wave 1) grade repetition experience. As we show below, the two approaches generate virtually identical results.

IV. Main Results

Summary statistics for our sample are shown in Table 1. The sample includes 51,270 children whose parents do not experience a displacement, and more than 2000 children whose parents are displaced. 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 $3300 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 percent of mothers in the non-displaced sample have a high school education or less, while 53 to 55 percent 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 (62 percent), compared to those whose parents are not displaced (73 percent).

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, 5.5 percent of children in the non-displaced group, and 6.6 percent of the 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 percent of the children without a parental displacement have repeated grades, but 9 percent 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 (2.3 percentage points versus 1.2 percentage point), but only a slightly larger increase in percentage terms (34 versus 30 percent). The table of means make clear that it will be important to fully control for the many differences in both observable and unobservable characteristics that may be correlated 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 four percent.

Table 2 shows the first set of regression results, relating children's grade repetition to family background characteristics, including income, 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 OLS regressions, in addition to the coefficients highlighted in the tables, include dummy variables for the panel year interacted with the survey wave, child's age in years, child's sex and race, state of residence at the initial survey wave, and head's completed education. Some specifications also include controls for family type (one- or two –parents). All of the additional control variables have the expected signs, and are generally strongly statistically significant. In the OLS results, the first academic year of data is dropped from the regression sample, since these years are used to construct the baseline controls for grade repetition and income.

Before turning to the main coefficients of interest, it is worth noting some sizeable differences in the likelihood of grade repetition across different demographic groups. 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.[1] Girls are 3 percentage points less likely to repeat a grade than boys in a given year; black children are roughly 3 percentage points more likely to repeat a grade than children of other races.

The first column of Table 3 does not control for the child's unobserved, fixed academic ability, and represents a basic cross-sectional approach to examining the relationship between grade repetition and parental displacement. 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 this specification can be considered exogenous. In this specification, a parental job loss one year ago is predicted to increase the child's probability of repeating a grade by 2 percentage points, a very large effect considering that the sample average is only 0.055. In column 3 of Table 2 we add a control for whether the child had already repeated a grade as of wave 1 of the survey panel in which they are included. This will approximate a fixed-effects approach, in which a child's own previous experience effectively controls for the many unobserved, fixed characteristics that might be correlated with both parental labor market factors and child's underlying academic ability. This is also the approach taken in work by Kalil and Ziol-Guest (2008), using the 1996 SIPP panel. Not surprisingly, including these controls substantially reduces the estimated effect of parental job loss on grade repetition, although the effect remains positive and statistically significant. In column 3, the estimated effect of job loss one or two years ago is approximately one percentage point. Note that the coefficient on grade repetition as of wave 1 is statistically indistinguishable from one, suggesting that a differencing-, or fixed-effects estimator is appropriate.

The regressions in Table 2 include three separate controls for the head's job loss, indicating different timing of the job loss with respect to the repeated grade. In particular, we include a control for job loss in the current year as a specification check. Children are not coded as repeating a grade until the second time the grade is attempted, thus, it is really only the

[1]Oreopoulos, Page, and Stevens (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.

coefficient for job loss one or more years ago that can reflect a causal effect of parental job loss on children's academic outcomes. A positive coefficient on the variable for job loss in the current year suggests that the child was experiencing academic difficulties before the job loss occurred. Once we include controls for grade repetition at wave 1, this coefficient is very small and statistically insignificant, providing some assurance that, conditional on baseline grade repetition, displacement is exogenous with respect to children's outcomes. In specifications shown in this table, we have also included a separate variable for job losses more than one year ago. Note that the dependent variable here reflects whether the child has ever repeated a grade, so that it remains equal to one throughout the child's observation window once it is initially changed to one. The coefficient for job loss two or more years reflects the total effect on grade repetition since the job loss. The coefficients on job losses one versus two or more years ago are never statistically different from one another, and can be combined into a single indicator for one or more years ago. More importantly, given the short nature of the SIPP panels, there are only a small number of observations that allow me to separately identify the effect of job losses more than one year after the displacement.

Focusing on the change over time in grade repetition by controlling for prior grade retention as of wave 1 (column 3 of Table 2) is clearly important to identifying a causal effect of job loss. One question is whether other baseline controls serve a similar purpose. In particular, if family income or earnings reflect parental abilities that may be correlated with children's abilities and with job loss, baseline income might serve as a similarly useful control. This does not appear to be the case. Column 2 shows that including baseline family income (*instead of* baseline grade repetition) does not seem to capture the heterogeneity in children's academic ability. Specifically, the coefficient on job loss in the current year remains positive and marginally significant, and the coefficients on job loss in prior years remain almost as large as in column one. This may reflect the fact that the income controls here represent income averaged only over a few months, and thus do not capture a family's permanent income level very well. On the other hand, it may be that even permanent income would not be an adequate control in this case. Given the short-run nature of the SIPP panels, this is not a question that can be answered with the current data.

While controlling for baseline grade repetition and the lack of any significant coefficients on job loss in the current year suggest that the effects of job loss we are picking up are causal, it

is still possible that correlation between child's and parents' underlying abilities or other characteristics could lead to bias on the estimated job loss coefficients. In particular, a child's prior experience with grade retention, especially in early grades, may not fully reflect their individual abilities, and so controlling for this may not fully eliminate concern about unobservable characteristics of the child of family. To address this concern, we use the wave 1 grade repetition of all siblings in the family as an additional control for unobserved heterogeneity. These results are shown in column four of Table 2. Sibling's average grade retention as of the beginning of the survey (after conditioning on the child's own experience) does increase the probability of a child's own retention. The estimated coefficients on parental job loss are unchanged, however, suggesting that conditioning on one's one prior grade repetition adequately controls for fixed, family-level heterogeneity that is correlated with job loss probabilities.

In column five of Table 2, we estimate a more standard fixed-effects model of the effect of parental job loss on grade repetition. As expected, the coefficients look very similar to those in the OLS model that includes baseline grade repetition. For simplicity, in most of the remaining tables, we estimated the fixed-effects model as the baseline specification. This is also consistent with the approach taken throughout the literature relating job loss to income and earnings changes of adults. Finally, as a final check that the job loss coefficients are not being driven by individual characteristics that may be correlated with the probability of job loss, we repeat the fixed-effects specification with a job loss indicator that does not include those individuals who left jobs due to being "discharged or fired." While many of these dismissals could reflect demand conditions, they are also the most likely category to include dismissals for cause. Given the reduced statistical power when using this definition of displacement, we combine the post-displacement effects into a single indicator for one or more years after job loss. With this definition of displacement, we observe only around 600 parental job losses. The point estimates in column six change very little, and the coefficient for one or more years after the job loss remains statistically significant at the ten percent level.

Job loss is typically found to have substantial effects on earnings, and on overall family income. For this study, it is important to document that these job losses also produce substantial reductions in income and earnings, since these may be an important mechanism generating the intergenerational effects. Table 3 summarizes, for this sample of children, the effects of job loss

on family income and earnings. In one important sense, it is more challenging to estimate effects of job loss on income or earnings than to estimate its effect on grade repetition using SIPP data. Earnings and income are likely to begin to decline prior to the job loss, even in the case of exogenous plant closings. Individuals working in declining firms may face hours reductions (including reduced overtime), or wage cuts, as demand conditions for the firm deteriorate. Unfortunately, given the short SIPP panels, it is virtually impossible to include additional controls for job losses in a future year. Thus, the income and earnings effects estimated use income or earnings in the year prior to the job loss as the relevant counterfactual level. If these income or earnings levels are already somewhat diminished by the impending job loss, estimates of income and earnings effects of job loss may be understated. Including controls for prior to the job loss is less of a problem for the grade repetition variable, because these effects should be zero until the year after the initial job loss.

With this caveat in mind 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 percent in the year after job loss. The effect based on using earnings levels is roughly $300. Earnings are reduced by approximately 14 percent 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-job loss 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, Page, and Stevens (2008), who report income reductions of approximately 12 percent in the short run. Overall, these results confirm the shock to family income that accompanies job loss by the head of household.

The next set of results explores whether there is substantial heterogeneity in the effects of job loss on children, based on their observable characteristics. If we know that some children are more likely to be negatively affected by parental job loss than others, it may be possible to target such children or families for additional assistance, or at least increase awareness of the potential intergenerational effects of the job disruption. Table 4 shows the effects of parental job loss on children with different demographic characteristics. Column 1 simply repeats the basic fixed-

effects specification for the full sample, collapsing the variables for after job loss into a single indicator for one or more years after. On average in the sample, a parental job loss increases the probability of grade repetition by just over 1 percentage point, or approximately 17 percent. The second column shows that boys' academic success appears to be more affected by parental job loss than that of girls. A parental job loss increases the likelihood of grade repetition by 0.015, compared to an increase of .008 for girls. Because boys have higher underlying probabilities of grade repetition, this difference is less pronounced in percentage terms. Boys (with average grade repetition of .088) experience a 16% increase from a parental job loss, while girls (average of .057) have a 14% increase.

The next set of results contrasts effects of job loss by race. Black children have much higher underlying rates of grade repetition, even after conditioning on income and other controls included in the Table 2 results. There is little evidence, however, that black and white children experience statistically different effects of parental job loss. The coefficient on job loss for black children is larger than that for white, but is not estimated precisely enough to be statistically distinguishable from that for white children. Similarly, splitting the sample by child's age shows similar effects of job loss on grade repetition for children younger than and older than ten years.

In addition to heterogeneity in effects by demographic characteristics, effects may differ according to the underlying financial and background characteristics of the families. One reason for exploring this dimension is that, if job loss mainly affects children through its effects on income, and thus on resources used for investment in children, the effects may be concentrated among those children who are relatively disadvantaged. Evidence for this is found in earlier work by Oreopoulos, Page, and Stevens (2008, hereafter OPS), and Page, Stevens, and Lindo (2008). OPS (2008) 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. The first several panels of Table 5 show results differentiated by the family's place in the income distribution as of wave 1 (before any of the job losses have occurred). Point estimates of the effects of parental job loss on grade repetition for families above and below the median of the income distribution are .011 and .007, respectively, suggesting larger effects above the median. These two point estimates, however, are within a single standard error one of another, and so are consistent with the hypothesis of no differences in the impact of job loss at different points in the distribution. The

third row of the table 5 shows that, among children in the bottom quartile of income, there is no evidence of larger than average effects on parental job loss on grade repetition.

It is worth considering why these results might differ from those of OPS (2008). Clearly, there are many differences in the setting and outcome measure of the two studies. Of particular interest is that these are immediately, or very short-run effects of job loss on children, while OPS are quite long term, focusing on effects when the affected children are in their late 20s and early 30s. These short-run effects cannot be capturing much long-run investment in children, while results focusing on adult earnings may include effects of such investments. The short-run effect may be equal for all children, and may reflect more similar short-run income losses or stress (perhaps arising from the income losses) in the household. It is not inconceivable that in more credit constrained households, these short-run effects may be more likely to carry forward into permanent effects. We have also examined differences in the impact of displacement on children across families with different levels of wealth. Effects of job loss among those from the bottom quartiles of the wealth distribution do not look substantially different from the overall sample results.

A possible reason for differences in the impact of job loss on children across the distribution of family income is that the size of the associated income shock from job loss differs across the income distribution. Both theory and evidence suggest complementarities between general and specific human capital, and so high earning households may suffer larger income losses from displacement (reflecting their relatively greater investments in firm-specific capital). As noted above, it is not clear that in this study of the short-term effects of job loss the size of the income shock has had time to generate differential effects on kids, but we can begin to investigate this possibility. The second and third columns of Table 5 summarize the size of the income loss (as measured by family income and its log) from the parental job losses across groups. Looking at the first three rows, across the family income distribution, there is relatively little systematic evidence of correlation between a family's place in the income distribution and the size of the income loss from job loss. The estimated percentage effect is larger above the median (20 percent) than below (13 percent), but among those in the lowest quartile, the effect on family income is in between these two estimates (15 percent). When family income in levels is used as the dependent variable, there is, as expected, a larger dollar amount is lost by families above the median. Given the similarity of effects on both family income and grade repetition at

different points in the income distribution, this is not informative about the relationship between income losses and effects on academic achievement.

The effects of job loss may also depend upon the academic abilities and preferences of the families that experience these shocks. Highly educated parents, for example, may be more likely to maintain investments or behaviors that facilitate children's academic success even in the face of short run income or other disruptions. Alternatively, children of parents with lower levels of education may be more vulnerable to these disruptions in terms of their own educational progress. The next two rows of Table 5 confirm that there are important differences in the effects of job loss on children by the educational level of the head of household. Among households where the head has only a high school degree or less, a parental job loss increases the probability of grade repetition by roughly 1.5 percentage points. In contrast, among those households where the head has at least some post-secondary education, the estimated effect of job loss is a statistically insignificant 0.4 percentage points. The confidence interval around this small estimate excludes the estimate for the less educated group. This is despite the fact that the proportional effect of job loss on family income is somewhat larger (13 percent versus 7 percent) among the more educated. This suggests that certain families and children may be systematically more at risk for the effects of job loss to be transmitted across generations. This is also consistent with a study of the longer run effects of job loss on children by Coelli (2005) who finds that the entire effect of parental job loss on high school completion occurs among those whose parents had a high school education or less.

Another group that may be particularly vulnerable to both academic difficulties and income shocks are children from single parent families. With a single earner in the household, income shocks from job loss may be more severe. Additionally, children from single-parent families may face more academic difficulties in general, and so may experience larger effects from the parents' job loss. Results in Table 5 show no evidence of statistically significant differences by family type in the effects of job loss on childrens' grade repetition. The point estimate for the effect on repetition is smaller among single parent families (.007), but within a standard error of the estimate for two parent families (.011). In this case, the size of the income shock is largest for single parent families, again providing no evidence of a correlation between the size of the income loss and the size of the effects on children.

Given the findings that children of less educated parents appear to be particularly vulnerable to effects of job loss in this setting, the final row of table 5 uses an alternative indicator of a child's academic vulnerability. Here, we divide the sample according to the experiences of a child's sibling at the time of the wave one survey. Specifically, the table shows estimated effects of job loss among those children whose older sibling had already experienced grade retention at the time of their entry into the panel. While sample sizes here are quite small, and the estimates relatively imprecise, there is no evidence that having a sibling who has repeated a grade is an indicator of particular risk in this setting.

The analysis in Table 5 is 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. Effects of job loss on other aspects of a child's home or family environment may also drive some of the associated academic difficulties. One important mechanism by which job loss might affect children's outcomes is that families experiencing a displacement may be more likely to move, which may in turn 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). 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 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 parental 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. Other parental time use variables are also available and produced similar results.

Table 6 shows that families in which the head experiences a displacement after wave one of the survey are more likely to move than non-displaced families: 29.1 (the difference between the fraction who have ever moved at wave 1 and who have ever moved by the final wave) percent of displaced families move after the second wave compared with 21.4 percent of the non-displaced group. Families in which the head experiences a displacement are slightly more likely to divorce or separate in the next few years than those without a displacement. The fraction of children with divorced parents increases by roughly 5 percentage points among the not displaced group, and 6.5 percentage points among the displaced. For the time use variables, there is little change in the number of times parents read to the child for either the displaced or not displaced group, and only a small increase in the number of times a parent eats dinner with their child among the displaced sample.

In Table 7, we report results from replacing the dependent variable in our main specification with the probabilities of divorcing or moving, or with the number of parental interactions with the child (per week). We find that involuntary job loss increases the likelihood of divorce or separation in the short run by a statistically significant 1.9 percentage points. Job loss increases the probability of relocation by 8 percentage points, and slightly increases the number of times a parent has a meal with the child. Both the divorce and mobility results could play a role in the academic difficulties associated with job loss. In the final column of Table 7, we show results from returning to the regression with grade repetition as the dependent variable, but also control for relocation, divorce, and time use. The coefficient on displacement is very similar to our earlier estimates, suggesting that these mechanisms do not explain a great deal of the displacement effect.

Finally, we note some important limitations on the analysis using the time use variables. First, the response rates for these questions in the SIPP are lower than for the questions in the core survey. More importantly, we are only able observe these variables at two points in time. While for grade repetitions we were able to identify the academic year in which the event occurred, we are not able to pinpoint the wave in which the changes in these variables occur.

V. Job loss, income, and local labor markets

Another approach to understanding why job loss produces these detrimental effects on children involves comparisons of the effects of individual job loss with effects of depressed local labor markets or with effects of reduced income. As noted in the introduction, several recent papers point to effects of local unemployment rates on health, mortality and other measures of well-being. This makes it more important to consider whether these individual-level displacement effects are actually identifying the effects of living in declining economic areas, regardless of one's own parents work status. Table 8 shows results from regression of the grade repetition measure on two measures of local economic conditions, along with the individual displacement indicators. First, we tabulate state-level unemployment rates from the Current Population Survey and include those in the regressions, both alone and with the displacement indicators. Second, we also create measures of mass layoffs at the year by state by industry of head's employment level to use as an indicator of generally declining prospects for particular families. These data are taken from the BLS mass layoff statistics program, which provide information on any layoffs of more than 50 workers from a particular firm for the period from 1994 to the present. These data are publicly available at the state by industry level. Counts of mass layoff events are constructed for each year by industry by state cell, and then merged to the basic SIPP analysis file.

The first column of Table 8 repeats our basic specification and shows the effect of displacement in a previous year on grade repetition of 1.3 percentage points. The sample here differs slightly because of some missing observations on state of residence. The next two columns add the state level unemployment rate in the previous year to the grade repetition regressions. The coefficient on state unemployment rate suggests that grade repetition is higher when the unemployment rate is high, but this effect is not statistically different from zero. More importantly, the coefficient on the individual displacement variables barely changes. The last two columns of Table 8 repeat this exercise, but using an indicator for whether the parent's industry and state has experienced mass layoffs in one of the previous three years. The coefficient when the mass layoff indicator is entered alone is negative and statistically significant, a surprising result. This suggests that children whose parents are working in an industry experiencing a local (state-level) employment contraction are somewhat less likely

(one-third of a percentage point) to repeat a grade. Despite the surprising sign on this coefficient, the final column shows that the effect of an individual displacement remains close to 1 percentage point and statistically significant when the mass layoff indicators are included. These results are preliminary, and more work is needed to understand the role of the mass layoff indicator, but our basic finding of an independent effect of the individual-level displacement indicator is robust to this extension.

Finally, we consider what our results would imply for the causal role of income on children's well-being if we interpret the full displacement effect as an income shock. This requires that displacement affects the child (and the family) only through income. For example, if displacement increases parental stress, or increases the likelihood of divorce (as we show above), these must be driven by the loss of income associated with displacement. While this is a strong assumption, it is worth exploring this interpretation given the extreme difficulty of finding truly exogenous variation in long-run income. Table 9 shows the results of several fixed-effects and fixed-effects IV estimates relating children's grade repetition to family income. First, the effect of income on children's achievement in a fixed-effects specification is extremely small but statistically significant. It is not surprising that the role of income is small here, since the fixed-effects estimate uses transitory variation in income across time periods. While there are reasons to believe permanent income is an important indicator of families' and children's well-being, it is less clear that there is a major role for transitory fluctuations in income. In addition, measurement error in family income combined with the fixed-effects specification should drive this coefficient towards zero.

The next column instruments family income with the individual displacement indicators, so that the effect of income on children is being identified by the contrast in income from before to after displacement. The use of displacement in the fixed-effects setting should eliminate the role of measurement error on the income coefficient. The estimated effect of income using the IV approach is very large. The point estimate in column two suggests that a 1000 increase in family income reduces the probability of grade repetition by nearly two percentage points, or almost 30 percent. This seems implausibly large, and may suggest that the assumption that all the displacement effect operates through income is not tenable. The next column instruments family income with the state-industry level mass layoff indicator and produces even larger effects on

grade repetition. Finally, the final column combines the mass layoff data (as an instrument for income) and the individual displacement indicators. Here, the (instrumented) income coefficient is again extremely large, but the displacement indicator becomes very small and statistically insignificant. This would suggest that the income variable captures all of the displacement effect, however, the magnitude on the income term requires caution in interpreting this result.

VI. Conclusions

This study has examined the intergenerational effects of job loss on children's 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. In the year of the job loss, there is no evidence of increased grade retention, which could indicate a spurious relationship since there has not yet been time for the causal relationship to play out. This finding is generated by models that include child fixed effects, and is robust to inclusion of baseline controls for grade repetition among other siblings in the family.

There is relatively little variation in the size of the effects of job loss on grade repetition across observable characteristics. One exception to this pattern is that children whose parents have at least some college education show much smaller effects of job loss than those whose parents have completed only high school or less. This does not appear to be related to the size of the income shocks due to job loss, with less-educated parents experiencing smaller income reductions in both levels and percentage terms. Such a finding suggests that children of less educated parents may be particularly vulnerable to income or other shocks in terms of their own academic achievement.

These findings of immediate, sizeable effects of job displacement on children's grade retention suggest that more attention should be paid to the potential role of external factors in affecting school level outcomes. 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. Our future research will explore how these individual-based results might aggregate to school-level results in areas affected by mass layoffs or plant closings.

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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	0.055	0.072	0.066	0.090
Monthly family income ($2004)	5299	5491	3619	3699
Monthy family earnings ($2004)	4923	5112	3267	3295
Child's age	9.75	12.05	9.05	11.38
Male	0.51		0.499	
White	0.79		0.74	
Black	0.14		0.19	
Father high school or less	0.41		0.53	
Mother high school or less	0.43		0.55	
Two parents in household	0.73		0.62	
N (children)	51,270		2,056	

Table 2
Effects of Parental Job Loss on Probability Child Repeats a Grade

Estimation by:	OLS	OLS	OLS	OLS	Child FE	Child FE
Head's job loss	(1)	(2)	(3)	(4)	(5)	(6)
Current year	0.019	0.018	0.005	0.005	0.000	0.001
	(0.011)	(0.011)	(0.005)	(0.005)	(0.004)	(0.006)
One year ago	0.021	0.019	0.009	0.009	0.010	0.009
	(0.008)	(0.008)	(0.004)	(0.004)	(0.004)	(0.005)
Two or more years ago	0.029	0.027	0.011	0.011	0.013	
	(0.011)	(0.010)	(0.006)	(0.006)	(0.005)	
Income at wave 1 (*1000)		-0.002	0.000	0.000		
		(0.000)	(0.000)	(0.000)		
Grade repetition by wave 1			0.980	0.946		
			(0.001)	(0.005)		
Siblings grade repetition by wave 1				0.053		
				(0.008)		
Displacement includings fired/discharged	yes	yes	yes	yes	yes	no
N=	120,284	120,284	120,284	120,284	168,243	168,243

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.

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	-0.0283	-0.1168	-231	-311
	(0.025)	(0.035)	(107)	(109)
One or more years prior	-0.1052	-0.1532	-302	-354
	(0.028)	(0.034)	(100)	(98)
N= **168243**				

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 person-academic year. Standard errors clustered on family identifiers.

Table 4
Effects of Head's Involuntary Job loss on Children's Grade Repetition
by Family and Child characteristics

	Full Sample	Boys	Girls	White	Black	Age<=10	Age >10
Head's job loss							
Current year	-0.0004	0.0063	-0.0069	0.0033	-0.0116	-0.0002	-0.0017
	(0.0043)	(0.0065)	(0.0055)	(0.0048)	(0.0114)	(0.0059)	(0.0060)
One or more years ago	0.0111	0.0145	0.0080	0.0106	0.0144	0.0119	0.0085
	(0.0040)	(0.0061)	(0.0050)	(0.0047)	(0.0093)	(0.0053)	(0.0059)
N=	168243	86185	82058	131517	25400	88866	79377
Average of Repeat for subgroup		0.088	0.057	0.066	0.112	0.054	0.096

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 reptition
including panel-wave dummies. Data are collapsed to one observation per person-
academic year. Standard errors clustered on family identifiers.

Table 5
Effects of Head's Involuntary Job loss on Children's Grade Repetition & Family Income
by Family and Child characteristics

Dependent Variable:	Repeated Grade	Family Income	Ln (Family Income)	Average Family Income	Average Probability of Repeating
Subgroup:					
Family Income > Median	0.0119	-787	-0.2126	7,819	0.050
	(0.0070)	(252)	(0.0391)		
Family Income < Median	0.0065	-361	-0.1398	2,682	0.098
	(0.0048)	(73)	(0.0349)		
Family Income 1st Quartile	0.0092	-395	-0.1812	1,837	0.110
	(0.0068)	(74)	(0.0533)		
Head High School or Less Education	0.0146	-187	-0.0795	3,599	0.095
	(0.0062)	(108)	(0.0359)		
Head Some College or More	0.0036	-456	-0.1516	6,683	0.056
	(0.0040)	(181)	(0.0428)		
Single Parent Family (Wave 1)	0.0067	-553	-0.2217	2,714	0.108
	(0.0058)	(88)	(0.0517)		
Two parent family (Wave 1)	0.0116	-197	-0.0529	6,297	0.060
	(0.0053)	(148)	(0.0323)		
Sibling has repeated at wave 1	-0.0073	-281	-0.0503	3,959	0.037
	(0.0056)	(152)	(0.0291)		

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 and income
including panel-wave dummies. Data are collapsed to one observation per person-
academic year. Standard errors clustered on family identifiers.

Table 6
Summary Statistics: Divorce, Mobility, and Parent Time Use

		Head Never Displaced		Head Displaced*	
		Initial Wave	Final Wave	Initial Wave	Final Wave
Ever Moved		0.039	0.253	0.069	0.360
Parents Divorced		0.155	0.204	0.183	0.248
	N=	45,919		1,771	
Parent Reads to Child		5.757	5.343	5.576	4.695
	N=	10,339	6,306	166	122
Parent has Dinner with Child		11.423	11.360	10.918	11.686
	N=	22,232	17,221	312	284

Note: Initial Wave is Wave 2 for "Ever Moved", Wave 1 for "Parents Divorced", Wave 6 for parent time use variables in the 1996 panel, and Wave 3 for parent time use variables in the 2004 panel.
***The head displaced category includes families in which the head is displaced after wave 1 for for the moved and divorced variables and families in which the head is displaced after the first response for the**

Table 7
Effects of Job Loss on Divorce, Mobility, and Parent Time Use

	Dependent Variable				
	Divorce	Relocation	Reads to Child (# times)	Dinner with Child (# times)	Grade Repetition
Job loss in					
Current year	0.0125	0.0331	0.0288	0.2556	0.011
	(0.008)	(0.016)	(0.274)	(0.121)	(0.007)
One or more years prior	0.0185	0.0764	-0.0426	0.2345	0.0175
	(0.008)	(0.016)	(0.178)	(0.131)	(0.007)
Controls for divorce, moving & time use	no	no	no	no	yes
N= **168243**					

Table 8

Effects of Individual Job Loss versus Local Labor Market Indicators on Grade Repetition

Head displaced in prior year	0.0127			0.0121	0.009
	0.003			0.0083	0.0022
State UER last year		0.0013		0.0013	
		0.0008		0.0008	
Mass Layoffs in state & industry in prior years			-0.0036	-0.0036	-0.0037
			0.0011	0.0011	0.0011

Table 9
Effects of Family Income on Grade Repetition
Fixed-effects and Fixed-Effects IV Estimates

Family Income (000s)	-0.0003	-0.0192	-0.0350	-0.0352
	(0.0001)	(0.0065)	(0.0150)	(0.0150)
Prior Displacement				0.00007
				0.0052
Instrument for income	none	parent displaced in prior year	parent in industry w/ prior mass layoffs	parent in industry w/ prior mass layoffs
F-stat on instruments		5.4	9.9	9.9