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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 percent. After conditioning on child fixed effects, there is no evidence of significantly 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.

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Children's success in school and, ultimately, in the labor market and beyond, depend 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 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 (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 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 evidence of long-run, intergenerational effects of job loss, there is very little evidence of immediate, or short-run, effects of parental job loss on children. Studies by Kalil and Ziol-Guest (2008) , and Rege, Telle, and Votruba (2008) find that job loss and plant closings produce negative effects in the short-run only for subsamples of the children studied, in

contrast to the broad findings of effects on the parents themselves and over the long-run for children. This study aims to address this gap by focusing on the short-run effects of job loss on children. One question is whether previous attempts to document short-term effects on children have been hampered by small sample sizes and imprecision. We expand the sample previously used by Kalil and Ziol-Guest (2008) by a factor of three, and exploit the detailed information on timing of job losses and children's outcomes to better capture any potential effects.

This paper begins by asking whether there are 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 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? Finally, 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 for understanding the mechanism behind these effects, 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 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. Work by Kalil and Ziol-Guest (2008) noted 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 nearly 1 percentage point a year, or roughly 15 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

Much of the motivation for this study comes from an emerging literature that documents long-term effects on the children of those fathers who have lost jobs in the past. 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.

As noted above, 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 three percent). 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 some statistically significant effects of involuntary job changes on the probability that children repeat grades and that they face expulsion. These effects, however, are limited to the small 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 gain statistical power to better identify these effects.

Another important difference between our approach and 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.

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. 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 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 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. 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 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 1,196 job losses affecting 2,170 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 on those students who are retained, especially on students in higher grades (Jacob and Lefgren, 2009). This suggests grade repetition may be a reasonable proxy for immediate academic difficulties that could carry over into longer-term effects.¹

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).²

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 percent of individuals who report their child

¹ Babcock and Bedard (2009), in contrast, 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.

² 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.

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 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 household 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:

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

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:

$$(2) A_{it} = \alpha_i + \beta_1 X_{it}^* + \gamma D_{it} + \delta AGE_{it} + \varepsilon_{it}$$

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 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 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. 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. We begin with the specification include children's baseline repetition, for ease of comparison with earlier work by Kalil and Ziol-Guest (2008), and then move to fixed-effects specifications, which produce nearly identical results. In addition, we also estimate models that control for a child's siblings' grade retention experiences at baseline, to further control for potential heterogeneity correlated with the child's academic performance.

IV. Results

a. 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 percent of mothers in the non-displaced sample have a high school education or less, while 54 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 (63 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, 5.4 percent of children in the non-displaced group, and 6.8 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 more than 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 (2.4 percentage points versus 1.7 percentage point), but only a slightly larger increase in percentage terms. The table of means make clear that it 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 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. Including dummies for the child's current grade, rather than child's age, produces almost identical results. Some specifications also include controls for

family type (one or two parents in the household). 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 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.³ 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 2 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 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. Although this coefficient is not statistically significant, it is relatively large, indicating a one percentage point increase in the probability of repeating a grade, indicating that this specification may not be adequately controlling for unobservables that are

³Oreopoulos, 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.

correlated with academic achievement and parental job loss. 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 will reflect causal effects of parental job loss on children's academic outcomes.

In column 2 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 interviewed. 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 of prior job losses remains positive and statistically significant. Once we include controls for grade repetition at wave 1, the coefficient on job loss in the current year is smaller and statistically insignificant.

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. In results not shown in the table, we have included wave 1 measures of family income, instead of wave 1 grade repetition measures. This continues to result in large (presumably spurious) estimates of the effects on grade repetition from job losses in the current year. 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. As an additional specification check, we use the wave 1 grade repetition of all siblings in the family as an additional control for unobserved heterogeneity. Even conditional on baseline controls for a child's own grade repetition, there could be additional information about family-level academic ability from the sibling's academic achievement measures. These results are shown in column four of Table 2. Because this exercise is only possible for families with more than one child, column three of the table repeats the prior specification for the subset of families in our sample with more than one child. This produces similar, but slightly larger estimates of the effect of job loss on grade repetition. As shown in column 4, siblings' 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 of primary interest on parental job loss are unchanged, however, suggesting that our results are not being driven by unobserved heterogeneity.

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 estimated coefficients are similar to those in the OLS model that includes baseline grade repetition. For simplicity, in most of the remaining tables, we estimate 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.

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 have also repeated the fixed-effects specification 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. Unfortunately, the standard errors on these indicators for different types of job loss make it impossible to differentiate between the two types. 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, and none are individually statistically significant.

Before exploring how these effects vary across different types of families, and given the similarity between the approach used here and that used by Kalil and Ziol-Guest (2008), we have explored what drives the differences in our results. The primary explanation appears to be the expansion of the data set. If we limit our data to only the 1996 SIPP panel, the coefficient on job loss one or more years ago suggests an increase in grade retention of 0.3 percentage points (coefficient = .003) (compared to 0.8 percentage points based on our full data set), with a standard error of .004. Note that this is not statistically significantly different from either zero, or our result based on the larger data set. The improved precision from our expanded sample

allows us to distinguish slightly better between sizeable, but statistically insignificant effects, and a true zero effect.

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. 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 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. 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 years after job loss. The effect based on using earnings levels is roughly \$290. Earnings are reduced by approximately 15 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-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, Page, and Stevens (2008), who report income reductions of approximately 12 percent 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.

The next set of results explores whether there is substantial variation 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 0.8 percentage points, or approximately 15 percent of the average probability. 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 0.012, compared to an increase of .004 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 15% increase from a parental

job loss, while girls (average of .057) have a 7% increase. Note, however, that the lack of precision of these estimates means that we cannot reject equally-sized effects for boys and girls.

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 smaller than that for white children, 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 .012 and .003, respectively, suggesting larger effects above the median. These estimates, however,

are also consistent with the hypothesis of no differences in the impact of job loss on grade retention 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.

A possible reason for expecting 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 may vary 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 (16 percent). Given the lack of clear patterns with respect to the effects of job loss on both family income and grade repetition at different points in the income distribution, we can offer little information about the relationship between the magnitude of income losses and associated 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 hint at 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 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 0.3 percentage points. This is despite the fact that the proportional effect of job loss on family income is somewhat larger (13 percent versus 8 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. Similarly sized income shocks from displacement produce more negative effects on educational achievement in households where the parents have less education.

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. We find, however, no evidence that children from single-parent

families are at particularly high risk of grade repetition following parental job losses. If anything, the results here suggest larger effects among two-parent households.

b. Investigating potential mechanisms

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 children's 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 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. 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: 32 percent (the difference between the fraction who have ever moved at wave 1 and who have ever moved by the final wave) of displaced families move after the second wave compared with 22 percent of the non-displaced group. While displacement is associated with increased mobility, even the families of non-displaced children are highly mobile. 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 close to 10 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. Based on these summary statistics, it is possible that either mobility or divorce induced by displacement could be an important part of the mechanism generating negative effects on children's academic achievement, with little role suggested for the parental time use variables.

In Table 7, 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 3 percentage points. 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. 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. Children whose families have changed residences in the current year are more likely to be repeating a grade, but this does not seem to be a major pathway for the effects of job loss. The coefficient on displacement is very similar to our earlier estimates, suggesting that these mechanisms do not explain much of the displacement effect. Including additional terms for residential moves in earlier years produces similar results.

c. **Job loss, income, and 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, Christopher Ruhm (2000, 2007) has a number of studies establishing a link between state-level unemployment measures and mortality. Similarly, Rajeev Deheji and Adriana 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. Table 8 shows results from regression of the grade repetition measure on state-level unemployment rates and the individual displacement indicators. 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 two years.

The first column of Table 8 includes only the state-level unemployment rate three year average, without the individual job loss indicators. A one percentage point higher unemployment rate leads to a 0.3 percentage point increase in the probability that a child repeats a grade. The sample size here differs slightly because of some missing observations on state of residence. 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 8 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, Kelle, and Vortruba (2007) who find that the negative impact of displacement on children occurs only in areas with high unemployment rates. The results in Table 8 confirm that there are effects on children of both individual parental employment shocks and the broader set of 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.

d. 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 percent. One of the major effects of job loss is a dramatic and persistent reduction in family income; estimates here suggest an average reduction in family income following job loss of approximately 10 percent. An obvious question that arises is whether all of the effect 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, such as that shown in Table 2, which is often assumed to be upward biased due to endogeneity of income or omitted variables that are correlated with children's academic ability. This coefficient would suggest that a 10 percent reduction in income would reduce grade repetition by three to seven percent, substantially less than the estimated effect of displacement. Clearly, 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 at least income shocks, in affecting the

outcomes of children, the major challenge of understanding precisely how income changes translate to changes in outcomes remains.

V. **Conclusions**

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 year of job loss which could indicate a spurious relationship since there has not yet been time for the causal relationship to play out. Our key 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. This is in contrast to earlier work that has found only limited evidence of short-run effects of displacement on children's academic outcomes. This difference seems to be primarily driven by our use of a larger data set, pooling three panels of the SIPP data, than earlier studies, and use of the detailed information in the SIPP on the timing of both job losses and grade repetition. Our results are robust to a variety of alternative controls for bias from unobserved heterogeneity, and suggest the effects are similar across many different demographic groups.

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.

The 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. Our finding that state-level unemployment rates also affect the likelihood of grade retention also supports this contention. 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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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	11.4
Male	0.51		0.5	
White	0.79		0.742	
Black	0.14		0.19	
Father high school or less	0.41		0.538	
Mother high school or less	0.43		0.55	
Two parents in household	0.73		0.63	
N (children)	51,098		2,170	

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:	OLS	OLS	OLS	OLS	Child FE
Head's job loss	(1)	(2)	(3)	(4)	(5)
Current year	0.010 (0.009)	0.004 (0.004)	0.005 (0.005)	0.005 (0.005)	0.003 (0.004)
One or more years prior	0.017 (0.009)	0.007 (0.004)	0.009 (0.005)	0.009 (0.005)	0.008 (0.004)
Grade repetition by wave 1		0.986 (0.000)	0.985 (0.001)	0.962 (0.004)	
Siblings grade repetition by wave 1				0.041 (0.006)	
N=	167,449	167,449	131,786	131,786	167,449

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	-0.0003 (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
by Family and Child characteristics

	Full Sample	Boys	Girls	White	Black	Age<=10	Age >10
Head's job loss							
Current year	0.0032 (0.0040)	0.0081 (0.0065)	-0.0014 (0.0046)	0.0036 (0.0047)	0.0025 (0.0100)	0.0043 (0.0056)	0.0013 (0.0053)
One or more years ago	0.0081 (0.0038)	0.0123 (0.0057)	0.0041 (0.0050)	0.0090 (0.0045)	0.0048 (0.0085)	0.0087 (0.0049)	0.0067 (0.0057)
N=	167,449	85,800	81,649	131,017	25,195	88,429	79,020
Average of Repeat for subgroup		0.088	0.056	0.0656	0.111	0.053	0.095

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.

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	Dependent Variable: Ln (Family Income)	Average Family Income	Average Probability of Repeating
Subgroup:				
Family Income > Median	0.0121 (0.0069)	-0.2160 (0.0390)	8,138	0.050
Family Income < Median	0.0025 (0.0045)	-0.1390 (0.0349)	2,022	0.096
Family Income 1st Quartile	0.0039 (0.0060)	-0.1775 (0.0530)	1,076	0.108
Head High School or Less Educati	0.0099 (0.0058)	-0.0930 (0.0358)	3,425	0.094
Head Some College or More	0.0026 (0.0039)	-0.1413 (0.0431)	6,543	0.055
Single Parent Family (Wave 1)	0.0009 (0.0053)	-0.2027 (0.0516)	2,430	0.106
Two parent family (Wave 1)	0.0106 (0.0051)	-0.0711 (0.0323)	6,189	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.

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	0.043	0.266	0.081	0.403
Parents Divorced	0.153	0.204	0.184	0.279
	N=	<i>51,098</i>		<i>2,170</i>
Parent Reads to Child (# times/week)	6.12	5.64	5.90	5.40
	N=	<i>14,103</i>	<i>11,610</i>	<i>453</i>
Parent has Dinner with Child (#times/week)	11.52	11.32	11.37	11.41
	N=	<i>26,863</i>	<i>26,863</i>	<i>983</i>

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.

"Initial Wave" is defined as the first wave in which each outcome is reported: 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

Table 7
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 & residential moves	no	no	yes
N=	150596	150596	150596

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.

Table 8
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	0.003	
	(0.001)	(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=

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.