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Local Job Losses and Child Maltreatment: The Importance of Community Context

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Abstract

A growing body of literature suggests that economic downturns predict an increase in child maltreatment. However, to inform policies and practices to prevent and intervene in child maltreatment, it is necessary to identify how, when, and under what conditions community-level economic conditions affect child maltreatment. In this study, we use North Carolina administrative data from 2006 to 2011 on child maltreatment reports and job losses to distinguish effects on maltreatment frequency from effects on severity, identify the timing of these effects, and test whether community characteristics moderate these effects. To isolate effects of unanticipated job losses and to control for potential confounding factors, we use a fixed effects regression approach. We find that, though job losses did not affect the frequency of reports, job losses increased the share of reports that were relatively severe. This effect endured for 9 months following job losses and was only evident in economically disadvantaged communities.

INTRODUCTION

Child maltreatment has serious short- and long-term health consequences, including illness, disability, psychopathology, and early mortality (Felitti et al. 1998; Cicchetti and Toth 2005). Many factors potentially lead to child maltreatment, including family- and community-level factors (Brown et al. 1998). Among the community-level factors considered, a growing number of studies have examined the influence of community economic conditions on child maltreatment. Many of these studies find that economic downturns are associated with an increase in the incidence of child maltreatment reports (for exceptions, see Bitler and Zavodny [2004] and Nguyen [2013]). However, findings from the extant literature largely do not address how, when, and under what circumstances community-level economic conditions might affect child maltreatment risk. A more comprehensive and nuanced understanding could potentially facilitate timely and targeted coordination of child protection policies aimed at alleviating the effects of economic downturns on families'

financial well-being and child welfare involvement through screened-in reports of child maltreatment.

The primary aim of the current study is to inform policy and practice by exploring four heretofore understudied aspects of the association between community-level job losses and child maltreatment reports. First, our study examines whether community job losses are associated with the severity rather than just the frequency of child maltreatment reports. Second, because it is possible that the influence of job losses on child maltreatment is delayed and may persist over time, we analyze the timing of job losses vis-à-vis their association with child maltreatment reports. Third, we consider whether the association between job losses and maltreatment reports is more pronounced in communities with already constrained labor markets. Fourth, we assess whether job losses to women and job losses to men have differential relationships with child maltreatment reports. The results provide new information about how, when, and under what conditions economic downturns influence child maltreatment reports. We examine these issues using administrative data on job losses and child maltreatment reports in North Carolina. Because of the breadth and depth of our data, we can investigate the important issues of severity, temporality, type of job loss, and community context—factors that previous work has been unable to address fully.

BACKGROUND

MECHANISMS CONNECTING COMMUNITY-LEVEL ECONOMIC DOWNTURNS AND CHILD MALTREATMENT

Urie Bronfenbrenner's ecological model provides a theoretical framework for how economic downturns at the community level can affect child maltreatment, both directly and indirectly (Bronfenbrenner 1995; Bronfenbrenner and Morris 1998). This developmental psychology framework posits that a child is embedded in a set of four nested, interdependent environmental systems. The microsystem represents contexts with which the child interacts directly (Bronfenbrenner and Morris 1998). Arguably the most important microsystem is the family, the system in which child maltreatment most often occurs. The remaining three systems represent distal contexts that interact with the family and with each other to influence the likelihood of child maltreatment. Community-wide economic downturns occur at the macro-system level and can influence child maltreatment through direct and indirect influence on microsystems. For example, economic downturns can directly affect the economic well-being of families through poverty, a key predictor of child maltreatment behavior (Kalil 2013). However, community-level economic downturns may also influence child maltreatment indirectly by shaping other community-level factors that can, in turn, affect child maltreatment behavior (Gassman-Pines, Gibson-Davis, and Ananat 2015). For example, such economic downturns can increase strains on social services (Black, McKinnish, and Sanders 2003), increase psychological disorders even for those who remain employed (Catalano et al. 2011), and increase demands to financially support members of social networks who lost jobs (Mykyta and Macartney 2011; Gottlieb, Pilkauskas, and Garfinkel 2014). Any of these indirect effects on the family might, in turn, influence the likelihood of child maltreatment (Drake and Jonson-Reid 2014).

Community-wide economic determinants may operate through different mechanisms, depending on the type of maltreatment involved. Economic downturns can, directly or indirectly, negatively affect the economic well-being of families and limit the ability of families to invest in their children (Yeung and Hofferth 1998; Anderson et al. 2013). If the economic strain is significant enough, this lack of investment could manifest as poverty-related neglect (Slack et al. 2004). Economic downturns can also give rise to increased psychological distress and financial strain, even among those who remain employed (Gauthier and Furstenberg 2010; Ayers et al. 2012). If severe enough, this psychological distress and financial strain can lead to harsh parenting behavior, including child maltreatment (Brooks-Gunn, Schneider, and Waldfogel 2013; Lee et al. 2013) and, potentially, nonmaterial neglect (Conger, Conger, and Martin 2010). A third type of maltreatment, sexual abuse, is unlikely to be affected by economic downturns, in so far as sociopathy is its primary predictor (Maker, Kemmelmeier, and Peterson 1999).

PREVIOUS RESEARCH ON THE EFFECTS OF DOWNTURNS ON CHILD MALTREATMENT

Studies that examine the association between economic downturns and child maltreatment can be divided into two categories, depending on the type of data involved. One set relies on emergency room (ER) discharge data (Berger et al. 2011; Huang et al. 2011; Wood et al. 2012, 2015); the other set has relied on data on investigations and substantiations from Child Protective Services (CPS) agencies (Steinberg, Catalano, and Dooley 1981; Seiglie 2004; Ben-Arieh 2010; Millett, Lanier, and Drake 2011; Lindo, Schaller, and Hansen 2013; Nguyen 2013; Frioux et al. 2014). The distinction is important as ER data are likely to capture more severe instances of child maltreatment, specifically injuries associated with physical abuse, whereas CPS data measure all types of child maltreatment, regardless of severity (we return to this point below; Widom 1988).

Studies using ER discharge data consistently report that economic downturns are associated with an increase in the frequency of hospital admissions because of injuries related to child maltreatment. The rate of abusive head trauma (AHT), a leading cause of death due to physical abuse, was significantly higher for children less than 5 years old during the Great Recession, as compared to the period immediately before (Berger et al. 2011; Huang et al. 2011; Wood et al. 2015). Mortgage delinquency rates have also been associated with higher hospital admission rates for physical abuse and traumatic brain injuries among children younger than 1 year (Wood et al. 2012).

On the other hand, studies using CPS investigation data report mixed findings. Many studies using CPS data find that economic downturns are associated with higher rates of child maltreatment investigations and substantiations (Seiglie 2004; Ben-Arieh 2010; Lindo et al. 2013; Frioux et al. 2014; Berger et al. 2015). Others report that the relationship between child maltreatment rates and the unemployment rate varied across states or counties within a state (Steinberg et al. 1981; Millett et al. 2011; Nguyen 2013), and one study finds no significant relationship (Bitler and Zavodny 2004). Furthermore, the direction of the association has not always been as anticipated, with some studies reporting that unemployment is associated with a decrease in child maltreatment (Nguyen 2013). Studies using CPS data also report mixed findings as to whether economic downturns affect both

physical abuse and neglect (Steinberg et al. 1981; Lindo et al. 2013) or affect neglect only (Seiglie 2004). Despite these mixed findings, our reading of the literature is that the CPS studies that have most rigorously addressed the potentially endogenous relationship between economic factors and child maltreatment indicate that economic downturns predict an increase in child maltreatment.

We also note that studies using CPS data often conflate severity with frequency. CPS administrative data capture maltreatment incidents of all types but typically provide no information about severity (Leventhal, Martin, and Gaither 2012). Therefore, changes in CPS reports as a function of economic downturns may reflect either a change in the severity of observed maltreatment or a change in the frequency of maltreatment. ER discharge data, on the other hand, capture more severe cases of child maltreatment compared to CPS data (Widom 1988; Petersen, Joseph, and Feit 2014). We infer that, because the ER-based studies consistently find a positive correlation between job loss and child maltreatment-related injuries, economic downturns may be associated with more severe child maltreatment, specifically physical abuse. Consistent with this interpretation, research finds that the Great Recession was correlated with an increase in the severity of AHT (Huang et al. 2011).

Finally, it is important to note that economic downturns may affect not only the severity and frequency of child maltreatment but also the agencies that respond to child maltreatment. CPS agencies often suffer funding cuts during and after times of economic recession (Seefeldt et al. 2012). These reductions in resources can determine the ability of agencies to adequately respond to and serve families that are referred, resulting in fewer investigated or substantiated reports (Boyer and Halbrook 2011). Moreover, referrals from the public at large may also decline during economic downturns, leading to fewer investigations (Stephens-Davidowitz 2013). Therefore, it is possible that an association between economic downturns and the systems used to address child maltreatment confounds the association between economic downturns and child maltreatment, which could also have contributed to the inconsistencies in CPS-based studies.

POTENTIAL MODERATORS OF THE EFFECT OF ECONOMIC DOWNTURNS ON CHILD MALTREATMENT

The association of economic downturns and child maltreatment may vary depending on the strength of a community's economy prior to the downturn, the gender of the displaced workers, and the time period over which the economic change is measured. Community-wide economic downturns may have stronger associations with child maltreatment in communities that, before experiencing job loss, were already experiencing high unemployment. People who lose jobs in the context of high unemployment suffer greater earnings losses after re-employment than those who lose jobs in communities with lower unemployment (Couch, Jolly, and Placzek 2011; Davis and von Wachter 2011). Moreover, people who lose jobs in communities with already weak labor markets remain unemployed for longer (Howland and Peterson 1988). In other words, displaced workers in communities with already weak labor markets may have greater difficulty finding another job and, even when they do, may earn less money than displaced workers in communities with stronger labor markets. Since economic hardship and stress associated with that hardship are both

significant risk factors of child maltreatment (Berger and Waldfogel 2011), this greater and more enduring economic influence on families could mean that children in communities with weak labor markets may be at greater risk for child maltreatment following economic downturns than children in communities with many employment opportunities.

It is also possible that the gender of the workers most affected by an economic downturn moderates the effect of economic downturns on child maltreatment. Jason Lindo, Jessamyn Schaller, and Benjamin Hansen (2013) find that only mass layoffs of men predicted an increase in child maltreatment investigations; layoffs that affected women led to a decrease in investigation rates. The authors suggest that, because fathers are more likely to abuse children (Sedlak et al. 2010), the increased time children spend with fathers when they are unemployed could increase the risk of child maltreatment, while mothers' unemployment may reduce the amount of time children spend with their fathers.

Additionally, economic downturns may be associated with child maltreatment in the long term, as well as the short term. Because many households have some financial resources to help cope with economic setbacks, the magnitude of the effect of involuntary job losses on people's economic well-being grows over several months following the job loss (Kinicki, Prussia, and McKee-Ryan 2000). Similarly, the association between job loss and child maltreatment may also grow over time, as households face dwindling savings and fewer resources. Moreover, job losses are also associated with depressed wages even after re-employment (Arulampalam 2001), which may be linked to child maltreatment risk through financial hardship or stress. Therefore, it is possible that the influence of economic downturns on child maltreatment may also persist over time even after re-employment. In fact, one study finds that the effects of economic downturns on rates of AHT remained elevated up to three years after the downturn (Wood et al. 2015).

THE CURRENT STUDY

The current study makes multiple contributions to this literature by assessing the influence of sudden and unanticipated community-wide job losses, our preferred operationalization of a local economic downturn, on screened-in reports of child maltreatment (i.e., allegations of abuse or neglect accepted by CPS for further attention) in North Carolina judicial districts from 2006 to 2011. First, this study disentangles the influence of job losses on the frequency of child maltreatment reports from influence on the severity of those reports. North Carolina provides a unique setting in which to examine the differential effects of community-wide job losses on the frequency and severity of maltreatment reports because North Carolina CPS uses a Multiple Response System (MRS) that requires CPS caseworkers to process cases based on an initial assessment of the severity of the report. This analysis uses this MRS process track assignment as a proxy for the severity of maltreatment.

Second, this study tests how long after job losses the influence on child maltreatment reports begins and for how long it endures. Third, this study assesses the unique effects of job losses to men and job losses to women on screened-in reports of maltreatment. Fourth, this study assesses the strength of a community's labor market prior to job losses as a potentially important moderator of the influence of job losses on child maltreatment reports. Fifth, this study is able to rule out potential third factors that could predict economic downturns and

changes in the rate and severity of child maltreatment by using a plausibly exogenous measure of economic downturns and a robust analytical approach.

METHOD

DATA AND MEASURES

This study tests the effects of economic downturns on the frequency and severity of screened-in reports of child maltreatment in North Carolina judicial districts from 2006 to 2011. Although the North Carolina CPS system is county-operated, each county is situated within a judicial district, and counties that are grouped within a district share a judge. Anecdotal evidence suggests that the decision making of caseworkers in each county is influenced by the judge at the judicial district. Therefore, counties situated in the same judicial district do not have independent outcomes. To account for this possible bias, all data were aggregated to the judicial district level. Judicial districts group together rural, less populous counties, while more populous counties have their own judicial districts. County boundaries may also not be realistic markers of local labor markets in rural, sparsely populated areas, because people in these areas seek employment in surrounding counties as well as in their own county of residence (Parker 2016). Thus, clustering together these counties into judicial districts also reduces possible measurement error due to individuals experiencing a job loss in one county while residing in a neighboring county.

Child maltreatment reports data came from the North Carolina Central Registry System, provided by the Jordan Institute for Families at the University of North Carolina. The child maltreatment reports data contain monthly information on all screened-in reports for all 42 North Carolina judicial districts. Screened-in reports consist of all referrals of child maltreatment made to CPS and accepted for further assessment or investigation. The frequency of child maltreatment reports is measured as the rate of total screened-in reports per 1,000 children ages 0–17 in each district using data on the annual child population in each judicial district provided by the North Carolina Office for Budget and Management.

While screened-in reports are a proxy measure for child maltreatment, these data do not capture those referrals of child maltreatment that were deemed unlikely by CPS caseworkers and therefore not screened in. It is important to note that the possible exclusion of true instances of maltreatment that were not screened in could lead to a downward biasing of the overall rate of actual maltreatment. Moreover, changes in screened-in reports capture both changes in actual instances of child maltreatment and changes in CPS caseworker screening decisions, and it is not possible to disentangle these two effects using these data. Unfortunately, data on all referrals made to CPS are not available for North Carolina because counties do not report referral statistics to the state (North Carolina Division of Social Services 2009).

The North Carolina CPS uses MRS, an alternative response system in which screened-in reports are assigned to process tracks in such a way that the severity of the maltreatment report can be inferred. At the time of initial screening, each screened-in report was assigned to either the Family Assessment (FA) track or the Traditional Investigation (TI) track. Reports assigned to the TI track include all screened-in reports of physical or sexual abuse,

abandonment, medical neglect, and hospitalization due to abuse or neglect and are considered more severe than FA track reports (North Carolina Division of Social Services 2009). FA track reports are less severe or indicate a lower risk of harm to the child. They include most reports of neglect, with the exception of abandonment, medical neglect, and other particularly serious cases of neglect. In short, the TI track is reserved for reports that present serious safety concerns for the child, while the FA track is intended for all other reports (North Carolina Department of Health and Human Services 2004). A 2009 evaluation of the MRS implementation in North Carolina indicates that caseworkers are using these two tracks as intended, screening the most severe cases of maltreatment into the TI track (Center for Child and Family Policy 2009). Therefore, this process track assignment is a proxy for the severity of the report.

The CPS data also include information about the most serious finding of each report, as determined by the investigation. This allows for an even more fine-tuned understanding of the severity of a given report. Within the TI track, there are four possible findings. In order from most serious to least serious, these findings are abuse and neglect, abuse, neglect, and unsubstantiated (a fifth category, dependency, was not observed). Within the FA track, there are four possible findings: services needed, services recommended, services provided no longer needed, and services not recommended. Because services recommended, services provided, and services not recommended are considered unsubstantiated, these three findings are collapsed into a single group, unsubstantiated, for the purpose of these analyses. While any given report may have multiple findings, the data only include information about the most serious finding made for that report.

To test the effects of economic downturns on child maltreatment reports, this study uses community-wide job losses as a proxy for economic downturns. Data on community-level job losses came from the North Carolina Job Loss Database provided by the North Carolina Employment Security Commission (NCESC). The job loss data contain monthly information about job losses due to business closings and layoffs and exclude employment separations initiated by the workers. The NCESC constructed these data by gathering information both directly from businesses and from news reports on closing and layoff events. Approximately two-thirds of job losses in these data are due to business closings, while the remaining third are due to layoffs. Economic change in a community is measured by scaling the total number of workers affected by job losses in the judicial district by the number of working-age adults (ages 25–64) in the district.

To assess whether job losses experienced by men influence child maltreatment reports differently than job losses experienced by women, this study uses as supplementary information Quarterly Workforce Indicators (QWI) provided by the Longitudinal Employer-Household Dynamics program of the US Census Bureau. These data contain information about job losses for all judicial districts, as well as whether those job losses were experienced by men or by women. However, unlike the monthly job losses data provided by the NCESC, the QWI job loss data are only provided quarterly. Additionally, while the NCESC data are a precise, albeit conservative, measure of monthly job losses, the QWI data reflect simply the sum over all firms in a district of the change in employment in each firm between one quarter and the next. While this approach will capture job destruction (and is

strongly correlated with the NCESC data), it will also capture changes in employment because of people voluntarily leaving or attriting from a job, resulting in an overcount of job loss. For this reason, we use the QWI measure only for supplementary analysis of gender, and we rely on NCESC for our main analyses.

While most prior studies use the unemployment rate to measure economic conditions, the current study adds to the extant literature by using large-scale job losses as the measure of economic change in a community. Because forced job losses, or job losses not initiated by the worker, are likely not anticipated by workers and communities, they are more likely to reflect exclusively exogenous changes in the economy than the more commonly used unemployment rate, which reflects changes both in the economy and in other phenomena that could independently affect child maltreatment (Ananat, Gassman-Pines, and Gibson-Davis 2011, 2013). Specifically, while the unemployment rate captures exogenous changes in the economy, it also captures the decision of workers to enter or exit the labor force. It is possible, for example, that previously inactive workers, encouraged by economic growth, choose to enter the labor market; this influx of individuals seeking employment can boost the unemployment rate, despite the improving economy. Nevertheless, job losses are strongly correlated with the unemployment rate. Job loss to 1 percent of a community's working population is associated with a 0.49 percent increase in the unemployment rate in the next quarter (Ananat et al. 2013).

Quarterly lagged predictor variables were included in all analyses to assess whether the effect of the economic downturn on screened-in reports of child maltreatment in month t are delayed and whether they persist over time. For the monthly job loss data, the quarterly lagged predictors were constructed by first creating monthly variables for $j = t - 1$ through $t - 12$ equal to the lagged value of the percent of the working-age population affected by job losses at month j . Then the values of the lagged variables were averaged in 3-month groupings.

To determine whether job losses differentially influence child maltreatment behavior in communities with weaker labor markets, we use the average 2004 unemployment rate as an indicator of the local labor market prior to the study period. Judicial districts were considered to have relatively weaker labor markets if their unemployment rate fell above the 2004 median, which was 5.7 percent.

ANALYTICAL STRATEGY

We conducted analyses of the effects of job losses on three outcomes: the rate of screened-in reports per 1,000 children, the share of total reports considered relatively severe as measured by MRS track assignment, and the rates of reports per 1,000 children by the most serious finding of that report. In additional analyses, we investigated how the effects of job losses on the rate of screened-in reports and on the share of severe reports may be moderated by pre-existing labor market conditions and by the gender affected by job losses. We do not present results for the job losses by pre-existing labor market conditions or by gender for the most serious finding of a report because of small sample sizes (estimates were not considered reliable).

Fixed effects generalized linear models were used for all analyses. Poisson regression models appropriate for modeling non-normally distributed counts and rates were used to examine the effect of community-wide job losses on the rate of maltreatment reports per 1,000 children. Ordinary least squares regression models were used to model the effect of job losses on the proportion of reports assigned to the TI track. Heteroskedastic-robust standard errors were clustered at the district level. All regression models included sets of dichotomous indicators for the following: judicial district, to capture persistent differences between districts; year of CPS report, to capture statewide changes that may affect job losses and CPS reports; and month of CPS report, to address seasonality. They also included linear district-specific over-time trends to capture linearly evolving differences in job losses and CPS reports by judicial district.

This type of fixed effects model is a standard approach to estimating the effects of macroeconomic conditions on health outcomes and has been used to estimate the effects of economic downturns on child maltreatment (Lindo et al. 2013; Frioux et al. 2014). Fixed effects models hold constant the average effect of each indicator included (Wooldridge 2008). In this case, the fixed effects models hold constant the average effects of each judicial district, each month, and each year, as well as control for the average linear trends within each district in both job losses and child maltreatment reports. Therefore, the inclusion of year, month, and linear time trend indicators isolates the effect of job losses that were aberrations relative to the overall economy in the state in a given month and year, and relative to any linearly evolving trends within districts. The inclusion of judicial district fixed effects controls for all stable differences between districts.

RESULTS

DESCRIPTIVE STATISTICS

Table 1 presents summary statistics for the key variables for the 3,024 district-months included in the analyses. During the study period, North Carolina CPS investigated an average of 5.92 reports per 1,000 children in a given month. Of these screened-in reports, 67.0 percent (3.96 reports per 1,000 children) were assigned to the FA track and 33.0 percent (1.96 reports per 1,000 children) were assigned to the TI track. In other words, approximately one-third of reports, based on initial risk screening, were of severe maltreatment. Within the FA track, 14.6 percent of reports (0.58 reports per 1,000 children) received a finding of services needed, while the remaining 85.4 percent of FA track reports (3.39 reports per 1,000 children) were unsubstantiated. Within the TI track, 70.4 percent of reports (1.38 reports per 1,000 children) were unsubstantiated, while 2.6 percent of reports (0.05 reports per 1,000 children) received a finding of abuse and neglect, another 2.6 percent (0.05 reports per 1,000 children) received a finding of abuse, and the remaining 24.4 percent of reports (0.46 reports per 1,000 children) received a finding of neglect.

On average, districts with a weaker labor market had a higher average rate of screened-in reports (6.23 reports per 1,000 children, on average, compared to 5.62 reports in districts with stronger labor markets) and had a larger share of screened-in reports assigned to the TI track (37.3 percent of total screened-in reports compared to 28.3 percent). Districts with weaker labor markets also had a slightly higher share of FA track reports that were

unsubstantiated (86.2 percent of FA track reports compared to 84.6 percent in districts with stronger labor markets) and a notably higher share of TI track reports that were unsubstantiated (80.4 percent of TI track reports compared to 66.7 percent in districts with stronger labor markets).

In regard to community job loss, on average, 0.12 percent of the working-age population was affected by job losses in a given district-month (table 1). The average job losses did not differ between districts with strong or weak pre-existing labor markets.

EFFECTS OF COMMUNITY-WIDE JOB LOSSES ON CHILD MALTREATMENT REPORTS AND FINDINGS

An increase in community-wide job losses was not significantly related to the rate of reports screened in for investigation, suggesting that the overall rate of screened-in reports remained stable in response to job losses (table 2, col. 1). However, community-wide job losses had a delayed and lingering relationship with the severity of subsequent screened-in child maltreatment reports, as suggested by the processing track to which reports were assigned. Specifically, a 1 percent increase in the percent of the working-age population affected by job losses was associated with an increase in the share of total screened-in reports assigned to the more severe TI track (table 3, col. 1) and an equivalent decrease in the share of reports assigned to the FA track (not shown). While there was no immediate effect in the same month as the job losses, in the 3 months following a 1 percent increase in the percent affected by job losses, there was a 1.11 percentage point increase in the percent of reports assigned to the TI track ($p < .01$), which is equivalent to a 3.35 percent increase in the rate of TI track reports ($p = .001$). Four to six months after the increase in the percent affected by job losses there was a 1.43 percentage-point increase in TI track assignment ($p < .001$), or a 4.32 percent increase in the rate of TI track reports ($p < .001$). Seven to nine months later there was a 0.72 percentage point increase in TI track assignment ($p < .05$), or a 2.18 percent increase in the rate of TI track reports ($p < .05$). Finally, a 1 percent increase in the percent affected by job losses had no relationship with TI track assignment more than 9 months later. Results examining rates of TI track reports per 1,000 children are substantially similar to those presented in table 3. Thus, these changes in track assignment reflect an actual increase in the number of investigated reports of relatively severe maltreatment, though the total number of screened-in reports remained stable after job losses. Panel A of figure 1 depicts the timing of the effect of job losses on the severity of the reports.

Tables 4 and 5 present findings for the relationship between job losses and specific types of CPS findings. Analyses of the association of job losses with reports' most serious findings within the TI track show that job losses had no relationship with the rate of abuse reports but that job losses were associated with an increase in neglect reports and TI unsubstantiated reports (table 4). A 1 percent increase in the percent of the working-age population affected by job losses was associated with a 3.59 percent increase in the rate of neglect findings in the 3 months following the increase in the percent affected by job losses ($p < .05$). In the 4–6 months after the increase in the percent affected by job losses, there was a 4.83 percent increase in the rate of neglect findings ($p < .01$). This effect attenuated after 6 months. Additionally, there was also a 3.21 percent increase in the rate of TI unsubstantiated reports

in the 3 months following a 1 percent increase in the percent affected by job losses ($p < .01$). In the 4–6 months after the increase in the percent affected by job losses, there was a 4.57 percent increase in the rate of TI unsubstantiated reports ($p < .01$). Finally, in the 7–9 months after the increase in the percent affected by job losses, there was a 2.35 percent increase in the rate of TI unsubstantiated reports ($p < .05$), after which the effect on TI unsubstantiated reports attenuated.

Within the FA track, a 1 percent increase in the percent of the working-age population affected by job losses was associated with a decrease in the rate of reports with a services needed finding, as well as a decrease in FA unsubstantiated reports (table 5). While there was no immediate decrease in reports, in the 3 months following the increase in the percent affected by job losses there was a 3.76 percent decrease in the rate of services needed findings ($p < .01$). In the 4–6 months after the increase in the percent affected by job losses, there was a 3.78 percent decrease in the rate of services needed findings ($p < .01$). At the same time, there was a 2.18 percent decrease in the rate of FA unsubstantiated reports in the 3 months after the increase in the percent affected by job losses ($p < .01$). Four to six months later, there was a 2.48 percent decrease in the rate of unsubstantiated reports ($p < .01$). An increase in the percent of the working-age population affected by job losses was not associated with a change in the rate of services needed reports or FA unsubstantiated reports more than 6 months later.

DIFFERENTIAL EFFECTS OF COMMUNITY-WIDE JOB LOSSES BY PRE-EXISTING LOCAL LABOR MARKET CONDITIONS

As in the analysis examining all districts, analyses conducted by subgroups defined by pre-existing district-level unemployment rates failed to identify an association between community-level job loss and the rate of screened-in reports (table 2, cols. 2 and 3). However, pre-existing labor market conditions were an important moderator of the association between community-wide job losses and the severity of screened-in reports, as indicated by the processing track to which reports were assigned. In fact, job losses were only associated with an increase in the severity of screened-in reports in districts with already weak labor markets, while job losses had no significant relationship with the severity of screened-in reports in districts with stronger labor markets (table 3, cols. 2 and 3). Specifically, in districts with weak labor markets, although there was no immediate effect on track assignment, there was a 1.33 percentage point increase in the share of cases assigned to the TI track ($p < .05$), or a 3.56 percent increase in the rate of TI track reports ($p < .01$) in the 3 months following a 1 percent increase in the percent of the working-age population affected by job losses. Four to six months later there was a 2.09 percentage point increase in TI track assignment ($p < .001$), or a 5.60 percent in the rate of TI track reports ($p < .001$). Seven to nine months after the increase in the percent affected by job losses there was a 1.35 percentage point increase in TI track assignment ($p < .05$), or a 3.62 percent increase in the rate of TI track reports ($p < .05$). Job losses did not have a significant relationship with TI track assignment in districts with weak labor markets more than 9 months later. In sum, job losses were associated with an increase in the share of all screened-in reports of child maltreatment that were considered relatively severe only in communities with already relatively weak labor markets. Within these communities, the effect of job losses on the

severity of screened-in reports of child maltreatment followed the same timing pattern noted above (fig. 1, panel *B*).

DIFFERENTIAL EFFECTS OF COMMUNITY-WIDE JOB LOSSES BY GENDER OF THOSE AFFECTED BY JOB LOSSES

Before presenting the results showing differential effects by gender of those affected by job losses, we first present the descriptive statistics for this supplementary QWI job loss measure. Using this supplementary measure, which represents an overcount of job destruction but which allows us to separate males and females, we find that a slightly larger percentage of men were affected by job losses than women. On average, 3.48 percent ($SD = 1.16$ percent) of working-age men were affected by job losses and 3.29 percent ($SD = 1.18$ percent) of women were affected by job losses in a given district-quarter.

Both job losses to men and job losses to women were not significantly related to the rate of reports screened in for investigation (table 6). However, the gender of those affected by job losses did moderate the relationship between job losses and the severity of screened-in child maltreatment reports (table 7). Specifically, a 1 percent increase in the percent of working-age men affected by job losses was associated with an immediate 1.33 percentage point increase in the share of total screened-in reports that was assigned to the more severe TI track in the second quarter after job losses, or a 4.02 percent increase over the base rate ($p < .05$). Two quarters after the increase in the percent of men affected by job losses, there was a 3.47 percentage point increase in the share of reports assigned to the TI track, or a 10.48 percent increase over the base rate ($p < .01$). Three quarters after the increase in the percent of men affected by job losses, there was a 2.01 percentage point increase in the share of reports assigned to the TI track, or a 6.07 percent increase over the base rate ($p < .01$).

However, a 1 percent increase in the percent of working-age women affected by job losses was associated with an immediate 1.35 percentage point decrease in the share of reports assigned to the TI track ($p < .01$), a 1.39 percentage point decrease in the quarter following job losses ($p < .05$), a 2.40 percentage point decrease in the second quarter after job losses ($p < .01$), and a 1.37 percentage point decrease in the third quarter after job losses ($p < .01$). These effects are equivalent to a 4.08 percent decrease, a 4.20 percent decrease, a 7.25 percent decrease, and a 4.14 percent decrease over the base rate, respectively. The differences between the effects of job losses to men and job losses to women were all statistically significant. In sum, while men's job losses were associated with a significant, immediate, and enduring increase in the rate of relatively severe screened-in reports, women's job losses were associated with a significant, immediate, and enduring decrease in the rate of relatively severe reports.

ROBUSTNESS CHECKS AND ADDITIONAL ANALYSES

To check that the results are robust to our choice of job losses as the predictor variable, we repeated all analyses while controlling for the district unemployment rate. All models included the unemployment rate in the month of the report, as well as the same lagged measures that were included for the job loss variable. The inclusion of the unemployment

rate did not substantially change the results presented here (see appendix tables A1–A4, available online).

Second, because MRS was implemented in three phases in North Carolina, it is possible that the 52 pilot counties with a longer history of MRS implementation may have had a different response in the wake of job losses than the 48 counties that implemented MRS later. Because MRS was implemented at the county level while this analysis is at the district level, we created an indicator that identifies whether more than half of a district's counties were pilot counties with more experience implementing MRS. The analyses show no significant differences between majority pilot districts and districts with fewer pilot counties in the effects of job losses on the rate of screened-in reports, the share of reports assigned to the TI track, and the rates of the most severe findings within each track (results available from authors upon request).

DISCUSSION

Using CPS MRS process track assignment as a proxy for severity, we find that community-level job losses are associated with an increase in the share of all screened-in reports of child maltreatment that are considered relatively severe and assigned to the TI track for investigation. However, we find that job losses had no relationship with the overall rate of screened-in reports of child maltreatment. Thus, although the overall number of investigated reports remained stable after job losses, an increased share of the reports reflected relatively severe maltreatment. The increase in relatively severe maltreatment reports peaked in the 4–6 months following job losses, after which the effect attenuated and dissipated entirely after 9 months following the job losses. This lagged but enduring effect is consistent with prior research on the effects of involuntary job losses (Kinicki et al. 2000; Arulampalam 2001) and may occur because families have had some amount of financial buffer that allowed them to absorb the consequences of large-scale job losses for a short period of time. A recovery from the shock of the job loss event or reemployment may explain the attenuation of the effect of job losses after 9 months.

Consistent with prior research (Seiglie 2004), job losses did not appear to have a relationship with reports of physical abuse. Community-wide job losses did have a relationship with an increase in TI reports of serious neglect and in reports that were unsubstantiated. The increase in serious neglect reports in the TI track after job losses suggests that this shift toward more severe reports likely reflects an increase in the risk of harm associated with actual neglect. However, that there was also an increase in unsubstantiated reports in the TI track after job losses highlights the possibility that a change in screening decisions led to at least some reports being screened into the TI track that should have been screened into the FA track instead. These findings suggest that economic downturns may lead to changes in CPS screening behavior that results in fewer reports being handled using an alternative response, the FA track. Given the known benefits of alternative response approaches for the safety of children (Center for Child and Family Policy 2009; Loman and Siegel 2014), it is possible that a shift away from using the FA track represents an understudied way in which economic downturns can be harmful to children.

We also find that the relationship between community-level job losses and severity of maltreatment does not occur in all communities. In fact, job losses are only associated with an increase in the severity of screened-in reports of child maltreatment in communities with already weak labor markets. This suggests that families living in communities with relatively higher rates of unemployment are particularly vulnerable to the effects of economic downturns. This finding is unsurprising given that job losses in a weak labor market are markedly different than job losses in strong labor markets. Individuals who lose a job in a weak labor market tend to be unemployed for longer and, once reemployed, may have reduced earnings for longer (Howland and Peterson 1988; Couch et al. 2011; Davis and Wachter 2011). These more extensive adverse effects of job loss on the financial well-being of families in weak labor markets could explain why job losses have a relationship with child maltreatment investigation only in these communities.

Finally, our finding that men's job losses and women's job losses have an opposing relationship with screened-in reports of child maltreatment is consistent with Lindo and colleagues' (2013) findings that men's job losses are associated with an increase in the rate of child maltreatment, while women's job losses are associated with a decrease. However, our results highlight that men's job losses are associated with an increase in the severity of screened-in reports of child maltreatment but not in the overall rate of reports, while women's job losses are associated with a decrease in that severity. This differential effect of men's and women's job losses may be a function of changes in who spends time with children when their mothers or fathers are laid off (Lindo et al. 2013). Since men may be more likely to suffer depression and anxiety during economic recession than women (Chen and Dagher 2016), more time spent alone with fathers who have lost their jobs may increase maltreatment risk for children. It is also possible that the amount of adult supervision children receive increases as a result of women's job losses if the woman was the second earner in the family, thereby reducing the risk of severe neglect.

Although the size of the effects of job losses on the severity of child maltreatment reports, a 4.32 percent increase in the rate of TI track reports in the 4–6 months after job losses, appears relatively small, they are similar to the effect sizes reported in prior studies that used CPS records data. Prior studies find increases in child maltreatment as a result of economic downturns that ranged from 1 to 6 percent (Bitler and Zavodny 2004; Seiglie 2004; Lindo et al. 2013; Nguyen 2013; Frioux et al. 2014). However, since severe child maltreatment is such a serious outcome, even this relatively small change in its incidence is of practical significance. For example, adding together the total effects of a 1 percent increase in the share of the working-age population affected by job losses in an average district in a single month translates to 28 additional severe reports. This would add up to an increase of 1,176 severe reports in North Carolina if all districts experienced such a 1 percent increase during just 1 month. The relationship between job losses and subsequent severe child maltreatment is even larger when strictly considering the effect of job losses to males. The effect of a 1 percent increase in the share of working-age men affected by job losses in an average district in a single month translates to 58 more severe reports, which would add up to 2,436 reports across all districts.

Together these results provide new information about how, when, and under what conditions economic downturns influence child maltreatment reports. This expanded knowledge is critical information that can help CPS caseworkers, program managers, and policy makers address child maltreatment risk in the wake of community job losses in a number of ways. First, understanding that there is a relationship between economic downturns and the severity of maltreatment reports but not the frequency suggests that program managers may want to allocate additional resources for caseworkers to investigate and provide services for more severe reports of maltreatment. Second, the more nuanced understanding of the timing of the influence of economic downturns on child maltreatment can help caseworkers understand when children in the community are at an increased risk and potentially require heightened attention, and it provides useful information to program managers and policy makers to improve the timing of resource allocations for CPS activities and supports for families. Third, the finding that only children in communities with already weak labor markets are affected allows policy makers to target limited resources to those communities. Policy makers might also consider using so-called place-based policies, which recognize that communities are made up of interconnected systems, and therefore intervene at the community rather than the individual level. Such policies could aid all children in these already disadvantaged communities by providing supports that assist all community members, including those who remain employed and those whose social network members have lost jobs. Finally, given that men's job losses in particular are associated with an increase in severe child maltreatment reports, when companies announce layoffs and closings, case workers and program managers may want to pay attention to whether the company is in a male-dominated industry and consider allocating resources accordingly.

This study also improves upon much of the extant literature by using a fixed effects regression approach. The inclusion of district, year, and month fixed effects, as well as linearly evolving district-specific time trends, increases our confidence in these results by controlling for many possible unmeasured factors that could explain both increases in job losses and increases in the severity of child maltreatment. Only three of the earlier studies employed a fixed effects approach, but none of these included time trends in their fixed effects, and thus even those studies only controlled for stable differences between years and communities (Seigle 2004; Lindo et al. 2013; Frioux et al. 2014).

However, while these results suggest that job loss has an association with the severity but not the overall frequency of child maltreatment reports, it is important to reiterate that, because of the measure used, these changes can reflect both a change in actual child maltreatment behavior and a change in CPS screening decisions. Thus, interpretations other than an increase in actual child maltreatment are possible. For example, the increase in the share of severe reports may reflect a change in the prioritization by CPS caseworkers who choose to focus limited agency resources on more severe cases during times of widespread economic strain. It is also possible that community members are more likely to report more severe maltreatment to CPS during times of economic strain. However, since agency budgets only change on an annual cycle, it is unlikely that changes in agency funding can explain the association between community-level job losses and CPS track assignment seen just 4 months following the job losses. While possible, it also seems unlikely that CPS practices or community reports would change in opposite ways depending on whether men or women

were more affected by the job loss. Unfortunately, however, we cannot completely disentangle the effects of downturns on actual child maltreatment from their effects on community reports and CPS decision making,

Other limitations to our study should be noted. Our study, like others that have relied on CPS data, likely reflects a lower bound of child maltreatment incidents (Sedlak et al. 2010). However, child maltreatment data from all sources suffers from underreporting, and CPS administrative data are preferable to emergency department data for the estimation of population-level trends (Widom 1988; Petersen et al. 2014). Another concern about CPS administrative data is that low-income families are overrepresented (Widom 1988; Sedlak et al. 2010). Thus, because low-income families are also likely to be more sensitive to economic changes, using CPS administrative data may lead to an overestimation of the effect of economic change on child maltreatment. If that were the case, however, community-wide job losses should also increase the frequency of maltreatment reports, which we did not find.

Moreover, additional questions remain. It is important to identify the possible causal mechanisms that link community-level economic downturns to child maltreatment, such as stress or reduced resources, changes in CPS agency behavior, and changes in referrals made to CPS by community members. Most important, research is needed to disentangle whether the effects noted in this body of literature reflect a change in actual maltreatment behavior or a change in the reporting and handling of maltreatment by agency officials. Additional research should also identify other possible moderating factors of the association between economic downturns and child maltreatment, including, notably, the economic well-being of families prior to the downturn. Finally, future research is needed to assess whether individual-and community-level interventions aimed at alleviating the consequences of economic downturns can effectively prevent or reduce child maltreatment behavior.

Despite these limitations, the results of this study confirm that policy makers and practitioners need to pay extra attention to child maltreatment risk during and after local economic downturns, particularly in communities that already have strained labor markets and in communities where men are primarily affected by the economic downturn. The most effective and efficient way to intervene in child maltreatment during economic downturns may be for CPS caseworkers to coordinate with caseworkers providing welfare, nutrition assistance, and unemployment services, as use of these services expands during economic downturns (Moffitt 2013). It may also be useful to strengthen social service programs during and after economic downturns, because these may help to prevent child maltreatment by buffering families from potential financial difficulties. This is particularly important given that social services programs are at a high risk of budget cuts during recessionary periods (Seefeldt et al. 2012).

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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References

- Ananat Elizabeth O, Gassman-Pines AnnaGibson-Davis Christina M. The Effects of Local Employment Losses on Children's Educational Achievement. In: Duncan Greg J, Murnane Richard J, editors *Whither Opportunity? Rising Inequality, Schools, and Children's Life Chances*. New York: Russell Sage Foundation; 2011. 299–313.
- Ananat Elizabeth O, Gassman-Pines AnnaGibson-Davis Christina M. Community-Wide Job Loss and Teenage Fertility: Evidence from North Carolina. *Demography*. 2013; 50(6):2151–71. [PubMed: 23884703]
- Anderson Patricia M, Butcher Kristin F, Hoynes Hilary W, Schanzenbach Diane. Working paper, *Recession Briefs*. Stanford University; Stanford, CA: 2013. Understanding Food Insecurity over the Great Recession.
- Arulampalam Wiji. Is Unemployment Really Scarring? Effects of Unemployment Experiences on Wages. *Economic Journal*. 2001; 111(475):585–606.
- Ayers John W, Althouse Benjamin M, Allem Jon-PatrickChilders Matthew A, Zafar WaleedLatkin CarlRibisl Kurt M, Brownstein John S. Novel Surveillance of Psychological Distress during the Great Recession. *Journal of Affective Disorders*. 2012; 142(1–3):323–30. [PubMed: 22835843]
- Ben-Arieh Asher. Socioeconomic Correlates of Rates of Child Maltreatment in Small Communities. *American Journal of Orthopsychiatry*. 2010; 80(1):109–14. [PubMed: 20397995]
- Berger Lawrence M, Michael Collins J, Font Sarah A, Gjertson LeahSlack Kristen ShookSmeeding Timothy. Home Foreclosure and Child Protective Services Involvement. *Pediatrics*. 2015; 136(2): 2014–32.
- Berger Lawrence M, Waldfogel Jane. OECD Social, Employment and Migration Working Papers 111. Organization for Economic Cooperation and Development; Paris: 2011. Economic Determinants and Consequences of Child Maltreatment. http://www.oecd-ilibrary.org/social-issues-migration-health/economic-determinants-and-consequences-of-child-maltreatment_5kgf09zj7h9t-en
- Berger Rachel P, Fromkin Janet B, Stutz HaleyMakoroff KathiScribano Philip V, Feldman KennethTu Li ChuanFabio Anthony. Abusive Head Trauma during a Time of Increased Unemployment: A Multicenter Analysis. *Pediatrics*. 2011; 128(4):637–43. [PubMed: 21930535]
- Bitler MarianneZavodny Madeline. Child Maltreatment, Abortion Availability, and Economic Conditions. *Review of Economics of the Household*. 2004; 2(2):119–41.
- Black Dan A, McKinnish Terra G, Sanders Seth G. Does the Availability of High-Wage Jobs for Low-Skilled Men Affect Welfare Expenditures? Evidence from Shocks to the Steel and Coal Industries. *Journal of Public Economics*. 2003; 87(9–10):1921–42.
- Boyer Bruce A, Halbrook Amy E. Advocating for Children in Care in a Climate of Economic Recession: The Relationship between Poverty and Child Maltreatment. *Northwestern Journal of Law and Social Policy*. 2011; 6(2):300–317.
- Bronfenbrenner Urie. Developmental Ecology through Space and Time: A Future Perspective. In: Moen PhyllisElder Glen H, , JrLuscher Kurt, editors *Examining Lives in Context: Perspectives on the Ecology of Human Development*. Washington, DC: American Psychological Association; 1995. 619–48.
- Bronfenbrenner UrieMorris Pamela A. The Ecology of Developmental Processes. In: Lerner Richard M, Damon William, editors *Handbook of Child Psychology: Volume 1, Theoretical Models of Human Development*. 5. Hoboken, NJ: Wiley; 1998. 993–1028.
- Brooks-Gunn JeanneSchneider WilliamWaldfogel Jane. The Great Recession and the Risk for Child Maltreatment. *Child Abuse and Neglect*. 2013; 37(10):721–29. [PubMed: 24045057]
- Brown JocelynCohen PatriciaJohnson Jeffrey G, Salzinger Suzanne. A Longitudinal Analysis of Risk Factors for Child Maltreatment: Findings of a 17-Year Prospective Study of Officially Recorded

- and Self-Reported Child Abuse and Neglect. *Child Abuse and Neglect*. 1998; 22(11):1065–78. [PubMed: 9827312]
- Catalano RalphGoldman-Mellor SidraSaxton KatherineMargerison-Zilko ClaireSubbaraman MeenakshiLeWinn KajaAnderson Elizabeth. The Health Effects of Economic Decline. *Annual Review of Public Health*. 2011; 32:431–50.
- Center for Child and Family Policy. Report. Center for Child and Family Policy, Duke University; Durham, NC: 2009. Multiple Response System (MRS) Evaluation Report to the North Carolina Division of Social Services (NCDSS).
- Chen JieDagher Rada. Gender and Race/Ethnicity Differences in Mental Health Care Use Before and During the Great Recession. *Journal of Behavioral Health Services and Research*. 2016; 43(2): 187–99. [PubMed: 24699888]
- Cicchetti DanteToth Sheree L. Child Maltreatment. *Annual Review of Clinical Psychology*. 2005; 1(1): 409–38.
- Conger Rand D, Conger Katherine J, Martin Monica J. Socioeconomic Status, Family Processes, and Individual Development. *Journal of Marriage and Family*. 2010; 72(3):685–704. [PubMed: 20676350]
- Couch Kenneth A, Jolly Nicholas A, Placzek Dana W. Earnings Losses of Displaced Workers and the Business Cycle: An Analysis with Administrative Data. *Economics Letters*. 2011; 111(1):16–19.
- Davis Steven J, von Wachter Till M. Working Paper 17638. National Bureau of Economic Research; Cambridge, MA: 2011. Recessions and the Cost of Job Loss. <http://www.nber.org/papers/w17638>
- Drake BrettJonson-Reid Melissa. Poverty and Child Maltreatment. In: Korbin Jill E, Krugman Richard D, editorsHandbook of Child Maltreatment. New York: Springer; 2014. 131–48.
- Felitti Vincent J, Anda Robert F, Nordenberg DaleWilliamson David F, Spitz Alison M, Edwards ValerieKoss Mary P, Marks James S. Relationship of Childhood Abuse and Household Dysfunction to Many of the Leading Causes of Death in Adults: The Adverse Childhood Experience (ACE) Study. *American Journal of Preventive Medicine*. 1998; 14(4):245–58. [PubMed: 9635069]
- Frioux SarahWood Joanne N, Fakeye OludolapoLuan XianqunLocalio RussellRubin David M. Longitudinal Association of County-Level Economic Indicators and Child Maltreatment Incidents. *Maternal and Child Health Journal*. 2014; 18(9):2202–8. [PubMed: 24682605]
- Gassman-Pines AnnaGibson-Davis Christina M, Ananat Elizabeth O. How Economic Downturns Affect Children's Development: An Interdisciplinary Perspective on Pathways of Influence. *Child Development Perspectives*. 2015; 9(4):233–38.
- Gauthier Anne H, Furstenberg FF. Research Working Paper. National Center for Family and Marriage; Bowling Green, OH: 2010. The Experience of Financial Strain among Families with Children in the United States; 10–17.
- Gottlieb AaronPilkauskas NatashaGarfinkel Irwin. Private Financial Transfers, Family Income, and the Great Recession. *Journal of Marriage and Family*. 2014; 76(5):1011–24. [PubMed: 25505802]
- Howland MariePeterson George E. Labor Market Conditions and the Reemployment of Displaced Workers. *Industrial and Labor Relations Review*. 1988; 42(1):109–22.
- Huang Mary I, O'Riordan Mary AnnFitzenrider EllenMcDavid LolitaCohen Alan R, Robinson Shenandoah. Increased Incidence of Nonaccidental Head Trauma in Infants Associated with the Economic Recession: Clinical Article. *Journal of Neurosurgery: Pediatrics*. 2011; 8(2):171–76. [PubMed: 21806359]
- Kalil Ariel. Effects of the Great Recession on Child Development. *The ANNALS of the American Academy of Political and Social Science*. 2013; 650(1):232–50.
- Kinicki Angelo J, Prussia Gregory E, McKee-Ryan Frances M. A Panel Study of Coping with Involuntary Job Loss. *Academy of Management Journal*. 2000; 43(1):90–100.
- Lee DohoonBrooks-Gunn JeanneMcLanahan Sara S, Notterman DanielGarfinkel Irwin. The Great Recession, Genetic Sensitivity, and Maternal Harsh Parenting. *Proceedings of the National Academy of Sciences*. 2013; 110(34):13780–84.
- Leventhal John M, Martin Kimberly D, Gaither Julie R. Using US Data to Estimate the Incidence of Serious Physical Abuse in Children. *Pediatrics*. 2012; 129(3):458–64. [PubMed: 22311999]

- Lindo Jason M, Schaller JessamynHansen Benjamin. Paper. Department of Economics, Michigan State University; East Lansing, MI: 2013. Economic Downturns and Child Abuse. http://econ.msu.edu/seminars/docs/EconomicDownturnsAndChildAbuse1-3-13_JL.pdf
- Loman L AnthonySiegel Gary L. Report. Institute of Applied Research; St. Louis, MO: 2014. Ohio Alternative Response Evaluation Extension: Final Report to the Ohio Supreme Court. <http://iarstl.org/papers/OhioARFinalExtensionReportFINAL.pdf>
- Maker Azmaira HamidKimmelmeier MarkusPeterson Christopher. Parental Sociopathy as a Predictor of Childhood Sexual Abuse. *Journal of Family Violence*. 1999; 14(1):47–59.
- Millett LinaLanier PaulDrake Brett. Are Economic Trends Associated with Child Maltreatment? Preliminary Results from the Recent Recession Using State Level Data. *Children and Youth Services Review*. 2011; 33(7):1280–87.
- Moffitt Robert A. The Great Recession and the Social Safety Net. *The ANNALS of the American Academy of Political and Social Science*. 2013; 650(1):143–66. [PubMed: 27065356]
- Mykyta LaryssaMacartney Suzanne. Social, Economic, and Household Statistics Division Working Paper 4. US Census Bureau; Washington, DC: 2011. The Effects of Recession on Household Composition: ‘Doubling Up’ and Economic Well-Being. http://www.norwescap.org/pdf_public/recession-effects.pdf
- Nguyen Loc H. The Relationship between Unemployment and Child Maltreatment: A County-Level Perspective in California. *Children and Youth Services Review*. 2013; 35(9):1543–55.
- North Carolina Department of Health and Human Services. 2004 “North Carolina’s Multiple Response System of Child Protective Services.” Report on Activities Conducted under Section 10.56(d) of S.L. 2003-284 to the Senate Appropriations Committee on Health and Human Services, the House of Representatives Appropriations Subcommittee on Health and Human Services, and the Fiscal Research Division, Raleigh, NC.
- North Carolina Division of Social Services. Family Services Manual. North Carolina Division of Social Services; Durham, NC: 2009. Chapter VIII: Child Protective Services.” 10–2009.
- Parker Timothy. Documentation. US Department of Agriculture, Economic Research Service; Washington, DC: 2016. Commuting Zones and Labor Market Areas: Documentation. <http://www.ers.usda.gov/data-products/commuting-zones-and-labor-market-areas/documentation>
- Petersen Anne C, Joseph JoshuaFeit Monica. New Directions in Child Abuse and Neglect Research. Washington, DC: National Academies Press; 2014. Describing the Problem; 31–68.
- Sedlak Andrea J, Mettenburg JaneBasena MonicaPeta IanMcPherson KarlaGreene AngelaLi Spencer. Report to Congress. US Department of Health and Human Services; Washington, DC: 2010. Fourth National Incidence Study of Child Abuse and Neglect (NIS-4).
- Seefeldt Kristin S, Abner GordonBolinger Joe A, Xu LanlanGraham John D. White paper. School of Public and Environmental Affairs, Indiana University; Bloomington, IN: 2012. At Risk: America’s Poor During and After the Great Recession. http://www.tavistalks.com/remakingamerica/wp-content/uploads/2011/12/Indiana-University_White-Paper_EMBARGOED-UNTIL-WED__JAN.-11-AT-8AM1.pdf
- Seiglie Carlos. Understanding Child Outcomes: An Application to Child Abuse and Neglect. *Review of Economics of the Household*. 2004; 2(2):143–60.
- Slack Kristen ShookHoll Jane L, McDaniel MarlaYoo JoanBolger Kerry. Understanding the Risks of Child Neglect: An Exploration of Poverty and Parenting Characteristics. *Child Maltreatment*. 2004; 9(4):395–408. [PubMed: 15538038]
- Steinberg Laurence D, Catalano RalphDooley David. Economic Antecedents of Child Abuse and Neglect. *Child Development*. 1981; 52(3):975–85. [PubMed: 7285664]
- Stephens-Davidowitz Seth. Essays Using Google Data. Harvard University; Cambridge, MA: 2013. Unreported Victims of an Economic Downturn; 64–95. PhD diss
- Widom Cathy Spatz. Sampling Biases and Implications for Child Abuse Research. *American Journal of Orthopsychiatry*. 1988; 58(2):260–70. [PubMed: 3285697]
- Wood Joanne N, French BenjaminFromkin JanetFakeye OludolapoScribano Philip V, Letson Megan M, Makoroff Kathi L, Feldman Kenneth W, Fabio AnthonyBerger Rachel. Association of Pediatric Abusive Head Trauma Rates with Macroeconomic Indicators. *Academic Pediatrics*. 2015; 16(3): 224–32. [PubMed: 26183000]

- Wood Joanne N, Medina Sheyla P, Feudtner Chris, Luan Xianqun, Localio Russell, Fieldston Evan S, Rubin David M. Local Macroeconomic Trends and Hospital Admissions for Child Abuse, 2000–2009. *Pediatrics*. 2012; 130(2):e358–64. [PubMed: 22802600]
- Wooldridge Jeffrey M. *Introductory Econometrics: A Modern Approach*. 4. Mason, OH: South-Western; 2008.
- Yeung W Jean, Hofferth Sandra L. Family Adaptations to Income and Job Loss in the U.S. *Journal of Family and Economic Issues*. 1998; 19(3):255–83.

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FIGURE 1.

Effects of local job losses on percent of reports assigned to the Traditional Investigation track over time, adjusted model estimates. A colored version of this figure is available online.

TABLE 1

Summary Statistics

	All Districts		Strong Labor Market		Weak Labor Market	
	Mean	SD	Mean	SD	Mean	SD
Percent affected by job losses	.12	.32	.12	.31	.13	.33
2004 unemployment rate	5.96	1.22	5.00	.54	6.87	.96
Total screened-in reports	5.92	2.07	5.62	2.11	6.23	1.99
Family Assessment (FA) track reports	3.96	1.73	4.03	1.67	3.90	1.78
Services needed	.58	.39	.62	.36	.53	.42
FA unsubstantiated	3.39	1.48	3.41	1.45	3.36	1.50
Traditional Investigation (TI) track reports	1.96	1.38	1.59	1.01	2.33	1.58
Abuse and neglect	.05	.07	.05	.07	.05	.07
Abuse	.05	.05	.04	.04	.05	.06
Neglect	.46	.36	.42	.32	.50	.39
TI unsubstantiated	1.38	1.08	1.06	.73	1.71	1.27
N/district-months)	3,024		1,512		1,512	

Note.—Means per 1,000 children. Districts with weak labor markets have a 2004 unemployment rate above the median.

TABLE 2

Effect of Job Losses on Rate of Screened-In Reports

	Screened-In Reports		
	All Districts	Strong Labor Market	Weak Labor Market
Percent affected by job losses:			
Month of report	.995 (.979, 1.011)	.995 (.972, 1.019)	.999 (.977, 1.021)
1–3 months before report	.992 (.984, 1.000)	.990 (.979, 1.002)	.997 (.985, 1.008)
4–6 months before report	.997 (.988, 1.005)	.996 (.983, 1.010)	1.000 (.987, 1.011)
7–9 months before report	.998 (.989, 1.007)	.992 (.978, 1.006)	1.004 (.992, 1.017)
10–12 months before report	.994 (.985, 1.004)	1.001 (.988, 1.014)	.991 (.979, 1.004)
Base rate	5.93	5.63	6.24
<i>N</i>	3,024	1,512	1,512

Note.—Reported coefficient is the incident rate ratio; the 95% confidence interval is in parentheses. Controls include year fixed effects, district fixed effects, month fixed effects, and linear district time trends. Districts with weak labor markets have a 2004 unemployment rate above the median. “Percent affected by job losses” is measured as the total number of workers who lost jobs during the window, as a percentage of the district’s working-age (25–64) population.

TABLE 3

Effect of Job Losses on Share of Reports Assigned to Traditional Investigation Track

	Reports Assigned to Traditional Investigation Track		
	All Districts	Strong Labor Market	Weak Labor Market
Percent affected by job losses:			
Month of report	.002 (−.016, .015)	−.007 (−.020, .007)	.008 (−.013, .028)
1–3 months before report	.011 ** (.004, .018)	.001 (−.007, .008)	.013 * (.003, .024)
4–6 months before report	.014 ** (.007, .022)	.000 † (−.009, .008)	.021 **, † (.010, .032)
7–9 months before report	.007 * (.000, .015)	−.005 † (−.013, .023)	.014 *, † (.003, .025)
10–12 months before report	.001 (−.005, .008)	.002 (−.005, .009)	−.002 (−.011, .008)
Base % of total screened-in reports	33.04	28.24	37.34
<i>N</i>	3,024	1,512	1,512

Note.—The reported coefficient is the OLS regression coefficient; the 95% confidence interval is in parentheses. Controls include year fixed effects, district fixed effects, month fixed effects, and linear district time trends. Districts with weak labor market have a 2004 unemployment rate above the median. “Percent affected by job losses” is measured as the total number of workers who lost jobs during the window, as a percentage of the district’s working-age (25–64) population.

* $p < .05$.

** $p < .01$.

† Significant difference between strong labor market and weak labor market groups $< .05$.

TABLE 4

Effect of Job Losses on Rates of Traditional Investigation (TI) Track Reports by Most Severe Finding

Most Severe Finding	
Panel A. Abuse and neglect:	
Percent affected by job losses:	
Month of report	1.066 (.929, 1.223)
1–3 months before report	.970 (.886, 1.063)
4–6 months before report	1.024 (.951, 1.102)
7–9 months before report	1.034 (.964, 1.150)
10–12 months before report	1.062 (.980, 1.150)
Base rate	.05
Panel B. Abuse:	
Percent affected by job losses:	
Month of report	.910 (.768, 1.079)
1–3 months before report	1.035 (.944, 1.136)
4–6 months before report	.948 (.859, 1.047)
7–9 months before report	.991 (.892, 1.100)
10–12 months before report	.929 (.836, 1.032)
Base rate	.05
Panel C. Neglect:	
Percent affected by job losses:	
Month of report	1.041 (.990, 1.093)
1–3 months before report	1.036 * (1.006, 1.067)
4–6 months before report	1.048 ** (1.020, 1.078)
7–9 months before report	.992 (.963, 1.022)
10–12 months before report	1.011 (.983, 1.039)
Base rate	.46
Panel D. TI unsubstantiated:	
Percent affected by job losses:	
Month of report	1.025 (.995, 1.056)
1–3 months before report	1.036 ** (1.015, 1.067)
4–6 months before report	1.046 ** (1.025, 1.067)
7–9 months before report	1.024 * (1.001, 1.047)
10–12 months before report	1.001 (.983, 1.019)
Base rate	1.38
<i>N</i>	3,024

Note.—The reported coefficient is the incident rate ratio; the 95% confidence interval is in parentheses. Controls include year fixed effects, district fixed effects, month fixed effects, and linear district time trends. “Percent affected by job losses” is measured as the total number of workers who lost jobs during the window, as a percentage of the district’s working-age (25–64) population.

* $p < .05$.

** $p < .01$.

TABLE 5

Effect of Job Losses on Rates of Family Assessment (FA) Track Reports by Most Severe Finding

Most Severe Finding	
Panel A. Services needed:	
Percent affected by job losses:	
Month of report	.962 (.924, 1.003)
1–3 months before report	.962 ** (.936, .989)
4–6 months before report	.962 ** (.938, .987)
7–9 months before report	1.001 (.976, 1.027)
10–12 months before report	1.002 (.981, 1.022)
Base rate	.58
Panel B. FA unsubstantiated:	
Percent affected by job losses:	
Month of report	.996 (.977, 1.015)
1–3 months before report	.978 ** (.965, .991)
4–6 months before report	.975 ** (.962, .989)
7–9 months before report	.990 (.978, 1.003)
10–12 months before report	1.000 (.989, 1.010)
Base rate	3.39
<i>N</i>	3,024

Note.—The reported coefficient is the OLS regression coefficient; the 95% confidence interval is in parentheses. Controls include year fixed effects, district fixed effects, month fixed effects, and linear district time trends. “Percent affected by job losses” is measured as the total number of workers who lost jobs during the window, as a percentage of the district’s working-age (25–64) population.

**
 $p < .01$.

*
 $p < .05$.

TABLE 6

Effect of Men's and Women's Job Losses on Rate of Screened-In Reports

	Screened-In Reports
Percent affected by job losses to men:	
Quarter of report	.993 (.975, 1.011)
1 quarter before report	.991 (.973, 1.001)
2 quarters before report	1.002 (.985, 1.018)
3 quarters before report	.999 (.982, 1.018)
Percent affected by job losses to women:	
Quarter of report	1.007 (.995, 1.019)
1 quarter before report	1.009 (.999, 1.020)
2 quarters before report	1.003 (.994, 1.012)
3 quarters before report	1.006 (.994, 1.018)
Base rate	5.92
<i>N</i>	1,008

Note.—The reported coefficient is the incident rate ratio; the 95% confidence interval is in parentheses. Controls include year fixed effects, district fixed effects, quarter fixed effects, and linear district time trends. “Percent affected by job losses to men” is measured as the total number of men who lost jobs during the window as a percentage of the district’s working-age (25–64) men. “Percent affected by job losses to women” is measured as the total number of women who lost jobs during the window as a percentage of the district’s working-age (25–64) women.

TABLE 7

Effect of Job Losses on Share of Reports Assigned to Traditional Investigation Track

Reports Assigned to Traditional Investigation Track	
Percent affected by job losses to men:	
Quarter of report	.013 ^{*,†} (.000, .026)
1 quarter before report	.010 [†] (−.005, .025)
2 quarters before report	.035 ^{**,††} (.018, .052)
3 quarters before report	.020 ^{*,†} (.003, .037)
Percent affected by job losses to women:	
Quarter of report	−.014 ^{**,†} (−.016, −.000)
1 quarter before report	−.014 ^{*,†} (−.025, −.003)
2 quarters before report	−.024 ^{**,††} (−.034, −.014)
3 quarters before report	−.014 ^{*,†} (−.025, −.003)
Base % of total screened-in reports	33.11
<i>N</i>	1,008

Note.—The reported coefficient is the OLS regression coefficient; the 95% confidence interval is in parentheses. Controls include year fixed effects, district fixed effects, quarter fixed effects, and linear district time trends. Job losses to men are measured as the total number of men who lost jobs during the window as a percentage of the district's population of working-age (25–64) men. Job losses to women are measured as the total number of women who lost jobs during the window as a percentage of the district's population of working-age (25–64) women.

*
 $p < .05$.

**
 $p < .01$.

[†] Significant difference between job losses to men and women $< .05$.

^{††} Significant difference between job losses to men and women $< .01$.