CAUTION! MEN NOT AT WORK:
GENDER-SPECIFIC LABOR MARKET CONDITIONS AND CHILD MALTREATMENT

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ABSTRACT

This paper examines the effect of labor market conditions—measured through unemployment, mass layoffs and predicted employment—on child abuse and neglect using county-level data from California. Using these indicators we separately estimate the effects of overall and gender-specific economic shocks. We find only modest evidence of a link between overall economic conditions and child maltreatment. However, analysis by gender reveals robust evidence that maltreatment decreases with indicators for male employment and increases with indicators for female employment. These opposite-signed effects are consistent with a theoretical framework that builds on family-time-use models and is supported by analysis of time-use data.

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1 Introduction

In 2014 alone, child protective services agencies in the United States investigated nearly 2 million referrals for child maltreatment and identified more than 700,000 victims—a rate of 9.4 victims per 1000 children.[1] Child abuse and neglect have grave and long-lasting consequences both for victims and for society. In addition to the immediate suffering that they experience, victims of maltreatment suffer from poor physical and emotional health and are at increased risk for depression, behavioral problems, and high-risk health behaviors (Fletcher 2009, Thornberry, Henry, Ireland, and Smith 2010). Abuse and neglect also have important long-term implications, as maltreated children are more likely to be unemployed, in poverty, and using Medicaid in adulthood (Zielinski 2009, Currie and Widom 2010) and are more likely to commit crimes (Currie and Tekin 2012). Meanwhile, child maltreatment imposes a number of direct and indirect costs on society—costs of hospitalization and ongoing physical and mental health care for victims, expenses for law enforcement and child welfare agencies, increased pressure on the criminal justice system, and lost productivity.

A large body of research establishes that poverty and parental unemployment are key predictors of child maltreatment. Thus, it is natural to assume that aggregate economic downturns should be associated with increases in child maltreatment. Perhaps surprisingly, the existing evidence on the relationship between macroeconomic conditions and maltreatment is mixed. Despite the onset of the Great Recession in December 2007, national child victimization rates fell from 2007 to 2012, continuing a downward trajectory that has spanned nearly two decades.[2] Meanwhile, a growing multi-disciplinary literature exploring the link between economic conditions and child maltreatment at the state and county level has generated seemingly contradictory results, with

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[1] U.S. Department of Health and Human Services (2015).

[2] The national child victimization rate was 15.3 (per 1000 children) in 1993 (U.S. Department of Health and Human Services 2001), 10.6 in 2007 (U.S. Department of Health and Human Services 2010), and 9.1 in 2012 (U.S. Department of Health and Human Services 2015).

some researchers finding a positive association between local unemployment rates and rates of child maltreatment (Frioux, Wood, Oludolapo, Luan, Localio, and Rubin 2014), others finding a negative association (Raissian 2015), and several studies generating mixed or inconclusive evidence on whether aggregate economic conditions influence rates of abuse and neglect (Paxson and Waldfogel 2002, Wood, Medina, Feudtner, Luan, Localio, Fieldston, and Rubin 2012, Bitler and Zavodny 2004, and Seiglie 2004).

Moreover, there exists an important gap in the literature on child maltreatment surrounding estimation of the effects of *gender-specific* labor market conditions on child maltreatment. There are several reasons why economic shocks that disproportionately one gender may have different effects on child maltreatment than economic shocks that disproportionately affect the other gender. Maltreatment data show that males and females are involved with different shares of abuse and neglect cases: males are more likely to perpetrate abuse, while females are more likely to be held responsible for child neglect (Sedlak, Mettenburg, Basena, Peta, McPherson, Greene, et al. 2010). It is also possible that many of the factors that may contribute to abuse and neglect, such as income, stress, substance abuse, childcare provision, household bargaining, and family structure, respond differently to changes in male and female labor market conditions. However, because of the difficulty of obtaining plausibly-exogenous and comparable indicators of labor market conditions facing men and women, few researchers have explored these relationships separately.[3]

This paper provides insight into the economic determinants of child abuse and neglect using county-level administrative data from California. In order to gain a better understanding of the relationship between overall economic conditions and child maltreatment, we construct new aggregate labor market variables that are more likely to be exogenous with respect to child maltreatment than standard economic indicators. These include predicted employment

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[3]Two existing state-level studies (Paxson and Waldfogel 1999, Cherry and Wang 2016) lend supporting evidence on this matter. These studies, along with their limitations, are discussed in Section 2.

rates and employment growth rates that capture demand-induced variation in labor market opportunities, as well as mass layoffs. Then, with gender-specific versions of these economic indicators, we separately estimate the effects of exogenous changes in labor market opportunities facing males and females on child abuse and neglect.

Focusing on measures of overall economic conditions, we find only modest evidence that the state of the local labor market is linked with child maltreatment. Specifically, while our estimates suggest that local unemployment rates are negatively related to rates of maltreatment, we do not find convincing evidence of any such effects when we instead consider our overall economic indicators that are more likely to be exogenous. Turning to the analysis of gender-specific economic conditions, we find that these estimates conceal important patterns by gender. In particular, decreases in male layoff rates and increases in male predicted employment rates are associated with decreases in child maltreatment, while decreases in female layoff rates and increases in female predicted employment rates are associated with increases in maltreatment.

While our empirical approach does not allow us to pin down the mechanisms underlying these effects, the pattern of estimates is informative. Because the *signs* of the effects of male and female employment on income, stress, substance abuse, and family structure are likely to be the same (even if the effects are not of the same magnitude), any model of the household that focuses on these mechanisms will have trouble explaining the asymmetry uncovered by our empirical analysis.[4] A bargaining model also does not explain why male employment appears to decrease maltreatment while female employment appears to increase maltreatment, as it seems unlikely that reducing women's bargaining power would promote children's welfare, especially in light of earlier work showing that women's bargaining power is negatively related to domestic violence (Aizer 2010).

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[4]Eliason and Storrie (2009a) and Eliason and Storrie (2009b) show that both male and female job losses leads to increased risk of hospitalization and death from self-harm or alcohol-related causes while Charles and Stephens Jr (2004) and Eliason (2012) show that both male and female job losses increase the risk of divorce.

A family-time-use model of the household with differential risks of maltreatment associated with a child's time spent with different caregivers can explain opposite-signed effects of male and female labor market conditions in a straightforward and intuitive manner: men's employment decreases child maltreatment by shifting childcare provision toward mothers, while women's employment increases child maltreatment by shifting childcare provision away from mothers.[5] In order to gain insight into the plausibility of this explanation, we supplement our analysis of maltreatment reports with an investigation of the relationship between parental employment and time spent with children using data from the American Time Use Survey. The results provide further support for the notion that the effects of job loss on child maltreatment may be driven by impacts on the distribution of childcare.

In addition to improving upon our understanding of the determinants of child maltreatment, this paper also contributes to a small but growing literature in economics that uses aggregate gender-specific economic variables to test the implications of economic models of individual and family decision-making.[6] Given the dramatic rise in female labor force participation and the prevalence of dual-earner families, models that allow for separate effects of shocks to male and female labor market opportunities are increasingly relevant. The results from this paper suggest that a gender-focused approach may be particularly important for understanding of the effects of economic shocks on child outcomes, and that the distribution of childcare within households may be an important mechanism mediating these effects.

The remainder of the paper is organized as follows. In the next section, we provide further background on child maltreatment victimization and perpetration, on the potential mechanisms through which local labor market opportunities may affect maltreatment, and on prior studies estimating the effects of local economic conditions on child maltreatment. We then discuss our data

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[5]This might be due to increased neglect, the blame for which is more likely to be assigned to mothers (even in two-parent households), or to increased abuse, which is more likely to be perpetrated by males. We discuss differential risks of maltreatment associated with different childcare providers in Section 2.

[6]See, e.g. Blau, Kahn, and Waldfogel (2000), Qian (2008), Aizer (2010), Schaller (2016).

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and key variables in Section 3, including the set of novel economic indicators that allow us to address potential endogeneity concerns and to separately identify shocks to labor market opportunities facing males and females. We explain our empirical strategy that uses these measures in Section 4 and present the results of our analysis of the effects of overall and gender-specific labor market conditions on child maltreatment in Section 5. Section 6 includes a discussion of mechanisms in light of our findings, along with an analysis of how parental employment relates to family time use using data from the American Time Use Survey. Section 7 concludes.

2 Background

2.1 Victims and Perpetrators of Child Maltreatment

According to a 2010 report to Congress based on the Fourth National Incidence Study (NIS-4) of Child Abuse and Neglect (Sedlak, Mettenburg, Basena, Peta, McPherson, Greene, et al. 2010), more than 1.25 million children experienced demonstrable harm resulting from maltreatment in the United States during a single study year (2005-06).[7] Sixty-one percent of these children were victims of neglect, while 44 percent experienced physical, sexual, or emotional abuse. The incidence of child maltreatment varies as a function of the socioeconomic characteristics of children's families. In the NIS-4, children with unemployed parents experienced neglect at rates two to three times higher than children with employed parents, and children in low-socioeconomic-status households (as defined by poverty, low parental education, or participation in a social assistance program) were more than three times as likely to be abused and seven times as likely to be neglected as children who were not in low-socioeconomic-status households.

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[7]The NIS-4 is a congressionally mandated study by the United States Department of Health and Human Services that measures the total number of children abused and neglected in the United States. The study collects data on children investigated by Child Protective Services (CPS) agencies and also gathers data from additional sources to estimate the scope of maltreatment beyond official statistics.

The NIS-4 report also reveals important asymmetrical patterns of maltreatment based on the gender of the perpetrator. Overall, children are more likely to be maltreated by females than by males (68% of maltreated children were maltreated by a female perpetrator, while 48% were maltreated by a male). However, the predominant sex of perpetrators is quite different for abuse and neglect cases, with females more likely to be involved with neglect (86% of neglect cases, versus only 38% for males) and males more likely to commit abuse (62% of abused children experienced abuse by a male perpetrator and 41% experienced abuse by a female perpetrator). The report attributes the predominance of females in neglect cases to the fact that mothers tend to be primary caregivers and are thus held accountable for failures in care.

2.2 Potential Mechanisms

While the correlations between child maltreatment and measurable household characteristics such as income, parental employment, and family structure are clearly documented and well-studied, theory suggests that the underlying causal relationships are likely very complex. Etiological models of child maltreatment from the fields of psychology and social work posit that child maltreatment is a result of the joint influence of—and interactions between— dozens of individual, family, environmental, and societal risk factors (Berger and Slack 2014, Stith, Liu, Davies, Boykin, Alder, Harris, Som, McPherson, and Dees 2009). Economists, meanwhile, have considered child maltreatment within the framework of theoretical models of investment in children, family bargaining, and criminal behavior (Berger 2005, Paxson and Waldfogel 2002, Seiglie 2004). Empirically, it has proven difficult to isolate causal relationships due to the likelihood that unobservable characteristics that lead to relatively poor economic outcomes (for example, mental health problems or high discount rates) also contribute to parents' likelihood of neglecting or abusing children. Given the variety of theoretical models, the multitude of known risk factors, and the limited empirical evidence on causal relationships, it is difficult to predict how changes in aggregate economic conditions might affect

rates of child maltreatment.

With these caveats in mind, here we briefly outline three main pathways through which changes in aggregate economic conditions might affect rates of child abuse and neglect. First, reductions in family income may result in increased rates of child maltreatment (and child neglect in particular) if they cause families to be unable to provide for children's basic physical, medical, educational, or emotional needs. Alternatively, reductions in income could reduce maltreatment by reducing substance abuse.[8] Changes in family income might also alter the distribution of power between perpetrators of maltreatment and other adults within a household, or alter the expected loss a perpetrator expects to incur if he or she is caught (Berger 2005).[9] Second, adults and children may experience stress and other mental health problems as a result of loss of family income, involuntary employment changes, and general economic uncertainty that might lead to increased maltreatment risk. Finally, changes in economic conditions might affect rates of child maltreatment through changes in time use. In particular, exogenous shocks to parental work hours or employment status could alter the amount of time that potential perpetrators spend in contact with children and directly caring for them.

In light of these possible mechanisms, there are several reasons to believe that the effects of aggregate economic shocks on rates of child abuse and neglect might mask differing effects of shocks to economic conditions facing males and females. For example, since fathers are often primary earners, labor market shocks that disproportionately affect males might have stronger income effects. There is also some indirect evidence that the mental health effects of male job losses are larger than the mental health effects of female job losses (Kalil and Ziol-Guest 2008, Schaller and Stevens 2015), though there are no studies (to our knowledge) focusing directly on *parents'* mental health. Meanwhile, we clearly expect changes in labor market opportunities that disproportionately affect one gender to have asymmetrical effects on bargaining

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[8]Notably, Ruhm and Black (2002) show that drinking falls during recessions, particularly among heavy drinkers.

[9]See Berger and Waldfogel (2011) for further discussion of these and other possible reasons for a causal association between family income and child maltreatment.

power and family time use. Holding labor market opportunities for men constant, an improvement in labor market opportunities for women is likely to increase women's bargaining power within a partnership and also to reduce women's share of childcare provided. And holding labor market opportunities for women constant, an improvement in labor market opportunities for men is likely to increase men's bargaining power within a partnership and also to reduce men's share of childcare provided. Finally, as discussed in the previous section, the types of maltreatment that men and women are typically involved in are different. In particular, men are more likely to commit abuse, while women are more likely to commit (or to be held responsible for) child neglect. To the extent that the mechanisms driving abuse and neglect are different, this too might contribute to differences in the effects of labor market conditions for males and females on maltreatment rates.

2.3 Existing Literature

A number of studies have used state- or county-level panel data to estimate the effects of various economic indicators on rates of child maltreatment, with mixed results. Early work using state-level data by Paxson and Waldfogel (1999, 2002), Seiglie (2004), and Bitler and Zavodny (2004) provides some evidence that economic variables, including child poverty rates, state median income, and unemployment rates, are associated with rates of child maltreatment. Focusing on parental employment status, Paxson and Waldfogel also find that increases in the fraction of children with working mothers and increases in the fraction of children with *non*working fathers are associated with increases in rates of child maltreatment. However, they do not address the potential endogeneity of these measures and are thus unable to assign a causal interpretation to their findings.

More recently, using state-level data, Cherry and Wang (2016) find an inverse association between male employment rates and child maltreatment but do not find an association between female employment rates and child maltreatment. Like Paxson and Waldfogel, Cherry and Wang do not address

the potential endogeneity of the gender-specific employment variables used in their analyses. In particular, there may be unobservable shocks that are correlated both with male and female labor *supply* choices and with the incidence of child maltreatment, or there may be reverse causality. Thus, while their estimates are informative about the reduced form associations between child maltreatment and male and female employment, they may not reflect causal effects.

Because of serious concerns about both the comparability of data across different states and possible unobserved confounding state-level shocks (see Paxson and Waldfogel 1999), other recent studies have used county level data within a single state to identify the association between overall economic conditions and child maltreatment rates. Using data from New York from 2000–2010, Raissian (2015) finds a negative association between county unemployment rates and rates of child maltreatment. By contrast, using data from Pennsylvania from 1990–2010, Frioux, Wood, Oludolapo, Luan, Localio, and Rubin (2014) find that increases in county unemployment rates are associated with increases in rates of child maltreatment. Meanwhile, using hospital discharge data linked to macroeconomic data for metropolitan statistical areas, Wood, Medina, Feudtner, Luan, Localio, Fieldston, and Rubin (2012) find no evidence of any link between local unemployment rates and rates of severe physical child abuse. None of these studies consider labor market shocks that disproportionately affect men or women.

3 Data and Key Variables

3.1 Abuse and Population

Our data on child maltreatment are state child welfare administrative data, obtained from the California Child Welfare Indicators Project, a collaboration between the University of California Berkeley and the California Department of Social Services. The data cover the period 1998–2012. We separately identify (1) reports of any maltreatment, (2) reports of abuse, including physical,

sexual, and emotional abuse, and (3) reports of severe or general neglect. Note that category (1) is not the sum of categories (2) and (3) because it additionally includes exploitation, caretake absence/incapacity, and "at risk because a sibling was abused." The data are counts of children who are the subject of a maltreatment allegation in a given analysis year.[10] We combine the maltreatment counts with population counts from the National Cancer Institute's Surveillance, Epidemiology, and End Results (SEER) program in order to create rates of reported maltreatment, abuse, and neglect per 1,000 children, which we use as the outcome variables in our analyses. We also use the SEER population counts to construct demographic control variables, i.e., the fractions of the population in each of four race/ethnicity groups and the fractions of the population in each of eight age groups.

Our analysis of county-level data within a single state is motivated by two concerns about state-level data. The first is a lack of comparability of data on reported abuse across states. States differ in how they define abuse, who is required to report abuse, and in how they record and respond to reports of abuse. A second concern with state-level data is that it is difficult to identify changes in definitions of abuse, reporting expectations, and standards for screening allegations of abuse that may have substantial implications for the number of reports that are observed in a given state and year. Because these confounding factors vary primarily at the state level rather than the county level, we are able to adjust for them in our analysis by controlling for year fixed effects.

Even at the county level, data quality is an issue for all studies of child abuse and neglect. Given that our outcome variables are based on *reports* of maltreatment—and reports of maltreatment can diverge from the true amount of abuse or neglect for a variety of reasons—they are best thought of as a proxy

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[10]Each child is counted only once in each county in a given time period, even if he or she is the subject of multiple allegations. If a child has more than one allegation in a given year, they are counted in the cell considered to be the most severe occurrence of maltreatment (the severity hierarchy ranks sexual abuse first, followed by physical abuse, neglect, then emotional abuse). If a child is subject of allegations in multiple counties, the child will be counted in each county where referred.

for the outcome of interest. For our purposes, there are two primary concerns with using such a proxy. First, our constructed measures of child maltreatment are likely to understate the true prevalence of child maltreatment because underreporting is such a serious issue (Waldfogel (1998)). That said, the bias that this issue might introduce can be eliminated by considering the effects in percentage terms rather than in levels.

A second issue is that the estimated effects of economic conditions can be biased if economic conditions have an effect on reports of maltreatment that is independent of effects on actual cases of maltreatment. Although some studies use this as motivation for focusing on substantiated reports rather than all reports, that approach introduces the possibility that the estimates would be biased by changes in the likelihood and speed of report substantiation, both of which may be affected by the changing availability of resources to local child welfare services agencies. For this reason, we instead focus most of our analyses on all reports of maltreatment. To address possible reporting bias, we incorporate controls for employment per capita in the highest-reporting sectors into our analysis. We obtain information on employment per capita in primary and secondary schools, social services, and hospitals from the US Census Bureau's County Business Patterns and employment per capita in law enforcement from the Uniform Crime Report's Law Enforcement Officers Killed and Assaulted (LEOKA) database.[11] Later, we also confirm that the patterns in our findings are robust to considering substantiated cases of maltreatment.

Summary statistics, presented in Table 1, show that the average rate of maltreatment across counties in our sample is approximately 52 reports per 1000 children in a county, with abuse and neglect rates at 20 and 22 reports per 1000 children respectively. Figure 1 demonstrates statewide trends in child abuse and maltreatment rates in California. The patterns in the two series are noticeably different. In particular, the abuse rate declined between 2000 and 2007, then increased slightly during the Great Recession and subsequent

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[11]In 2014, law enforcement personnel, school employees, social services workers, and medical professionals were responsible for 18.1, 17.7, 11.0, and 9.2 percent of reports to Child Protective Services, respectively (U.S. Department of Health and Human Services 2015).

recovery between 2008 and 2012, while the neglect rate increased over almost the whole sample period, from less than 18 reports per 1000 children in 1998 to around 25 reports per 1000 children in 2012.

3.2   Economic Conditions

We consider several different economic indicators in our analyses. We begin with the local (county) unemployment rate, which is the measure most commonly used in studies examining the link between economic conditions and health in the United States. This variable, which we obtain from the Bureau of Labor Statistics (BLS), reflects both short- and long-run unemployment as well as movements in and out of the labor force, and is intended to proxy for the overall state of the economy. One caveat about the unemployment rate is that it is potentially endogenous with respect to changes in child maltreatment because it depends on the size of the population actively participating in the labor force at a given time. In particular, there may be unobservable factors at the county level that are associated both with labor supply and with child maltreatment.

To address the potential endogeneity of the unemployment rate and to explore the robustness of our estimates to alternative labor market indicators, we construct three other economic indicators. The first of these is the county mass layoff rate, which we calculate by dividing the number of workers involved in an extended mass layoff event (also from the BLS) by the population of adults between the ages of 18 and 64.[12] We also use data from the 1990 decennial census (Ruggles, Genadek, Goeken, Grover, and Sobek 2015) and March CPS (Flood, King, Ruggles, and Warren 2015) to construct predicted employment rates and employment growth rates in the spirit of the work of Bartik (1991), Katz and Murphy (1992), and Blanchard and Katz (1992).[13] While these are imperfect proxies for actual labor market conditions, they have

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[12]An "extended mass layoff event" is one in which more than 50 workers are separated from a private non-farm employer for at least 31 days.

[13]Because information on counties with population less than 100,000 is not available in the public-use version of the 1990 census, regressions on these index include only the 34 largest counties.

the major benefit of isolating *demand*-driven changes in employment.

To calculate annual predicted employment rates for each county-year observation, we first calculate annual predicted employment *levels* by multiplying each county's base-period (1990) shares of statewide industry employment by statewide annual industry employment counts and take the sum across industries for each county-year as follows:

$$\hat{E}_{ct} = \sum_i E_{it} * \frac{E_{ci90}}{E_{i90}}$$ (1)

where E_{it} is the total employment in industry i in California in year t and $\frac{E_{ci90}}{E_{i90}}$ is the share of total employment in industry i in 1990 accounted for by individuals from county c.[14] This formula yields employment levels predicted for county c in year t based on its share of employment across different industries in 1990 and statewide employment levels across industries in year t. To convert this to an employment *rate*, we divide the predicted employment level by the current population of adults between the ages of 18 and 64 in the county.

To calculate predicted employment *growth* rates, we take a slightly different approach: we multiply the base-period share of each county's workforce that is employed in a given industry by statewide annual industry employment growth rates and take the sum across industries for each county-year as follows:

$$\hat{G}_{ct} = \sum_i G_{it} * \frac{E_{ci90}}{E_{c90}}$$ (2)

This formula yields the rate at which employment is predicted to grow in county c in year t based on its distribution of employment in 1990 across industries and the statewide growth of these industries in year t.

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[14]We define 20 industry categories: agriculture, forestry, and fishing; mining; construction; low-tech manufacturing; basic manufacturing; high-tech manufacturing; apparel/textiles manufacturing; transportation; telecommunications; utilities; wholesale trade; retail trade: motor vehicle, home, farm; retail trade: food, drugs, apparel, and general merchandise; finance, insurance, and real estate; business and transportation services; technical and repair services; personal services; entertainment and recreation services; professional and related services; public administration.

As shown in Table 1, the average unemployment rate in our sample is 7.5 and the average layoff rate is 1.2 per 100 adults. Time trends in the two variables, shown in Figure 2 largely follow similar patterns, though the layoff rate slightly leads the unemployment rate and experiences a brief decline in the midst of the Great Recession. The average predicted employment rate in our sample is 73.54 and the average predicted employment growth rate is 0.9 percent.

To estimate the effects of shocks to labor market conditions facing males and females on child maltreatment rates, we construct an analogous set of gender-specific economic indicators, intended to represent demand-induced changes in labor market opportunities for men and women. We begin by again using the BLS mass layoff statistics, which are available by gender, to construct rates of males and females involved in mass layoff events.

To construct annual predicted employment rates by county and gender, we construct annual predicted employment levels by county and gender by multiplying the base-period (1990) shares of statewide industry employment for each gender in each county by statewide annual industry employment counts and taking the sum across industries for each county-year as follows:

$$\hat{E}_{gct} = \sum_i E_{it} * \frac{E_{gci90}}{E_{i90}} \tag{3}$$

where E_{it} is the total employment in industry i in California in year t and $\frac{E_{gci90}}{E_{i90}}$ is the share of total employment in industry i in 1990 accounted for by individuals from group g (male or female) in county c. Intuitively, the argument of the sum is the number of individuals predicted to be employed in industry i from group g in county c in year t on the basis of its share of overall employment levels in 1990 and the overall employment level in year t. As such, this measure captures variation in employment that is generated by changes in the overall state of the California economy but that varies across counties and gender because of historical differences in the distribution of statewide industry employment by gender and geographic location. To convert this measure into *rates*, we divide by the number of individuals from group g living in county c

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in year t, which is based on the SEER population data described above.

To generate predicted annual employment growth rates by county and gender, we interact the base-period (1990) share of workers in each county-by-gender cell employed in each industry with annual industry employment growth rates for California, and take the sum across industries by gender and county as follows:

$$\hat{\Gamma}_{cgt} = \Sigma_i G_{it} * \frac{E_{igc90}}{E_{gc90}} \tag{4}$$

where G_{it} is the statewide growth rate of industry i in year t and $\frac{E_{igc90}}{E_{gc90}}$ is the share of individuals from group g in county c that was employed in industry i in 1990. Intuitively, the argument of the sum is the predicted employment growth for individuals from group g in county c in year t on the basis of the share working in industry i in 1990 and the overall growth rate for industry i in year t. As such, this measure captures variation in employment that is generated by variation across industries and over time in employment growth that has differing effects across counties and gender because of historical differences between county-by-gender cells in the distribution of employment across industries.

These gender-specific predicted employment variables by gender are in the spirit of Aizer (2010), who uses a similar strategy to construct indices of relative wages in order to determine the effects of relative female wages on domestic violence and Schaller (2016), who uses similar indices to study the effects of gender-specific labor demand shocks on fertility. The advantage of these variables is that they are unlikely to be driven by localized shocks in labor supply, and are thus plausibly exogenous with respect to child maltreatment.

Figure 3 contains scatterplots of these gender-specific measures of economics conditions. Panel A focuses on mass layoffs, with the scatterplot on the left presenting raw data, while that on the right presents residualized data after a regression controlling for county fixed effects, year fixed effects, county-specific linear trends, county demographic composition, and controls for employment in high-reporting sectors. Both figures suggest a positive correlation, that more female mass layoffs are associated with more male mass

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layoffs. However, while the raw data exhibits significant clustering, the residualized data show considerable variation off the 45 degree axis with minimal clustering. This suggests that there is independent variation in male and female mass layoffs that can be used to separately identify their effects. Panel B presents similar comparisons for predicted employment rates. Again the gender-specific measures of economic conditions exhibit a positive correlation. Furthermore, the clustering is even more apparent. The residualized measures eliminate the apparent clustering in the data and again suggest that, while the two measure are correlated, that there is independent variation that can be used to identify gender-specific shocks. Panel C provides similar evidence using predicted employment growth rates.

4   Empirical Strategy

Our empirical strategy closely follows in the footsteps of previous researchers that have investigated the causal effects of aggregate economic conditions on health outcomes. In particular, since Ruhm (2000), a standard approach in this literature has been to use area-level panel data and regression models that control for area fixed effects, area-specific trends, and year fixed effects. This approach eliminates both the possibility that the estimates might reflect spurious trends in the aggregate and the possibility that the estimates might reflect fixed or linearly-trending differences across high- and low-unemployment areas. In concrete terms, this "area approach" estimates how health outcomes in an area change from trend over and above changes occurring across all areas when its economic conditions change from trend over and above changes occurring across all areas. The estimates are identified using variation across areas in the timing and severity of changing economic conditions. Assuming that unobservable variables related to the outcome of interest do not deviate from an area's trend when its economic conditions deviate from trend, this approach will uncover the causal effect of aggregate economic conditions.

We operationalize this strategy with Poisson models of the following form:[15]

$$E[Y_{ct}] = exp(\Phi_{ct}\beta + \alpha_t + \gamma_c + \theta_c t + X_{ct}\lambda) \tag{5}$$

where Y_{ct} is the number of maltreatment reports per 100,000 children in county c and year t, Φ_{ct} is a measure (or set of measures) of economic conditions in county c and year t, α_t are year fixed effects to capture changes occurring across all counties in each year, γ_c are county fixed effects to control for time-invariant county characteristics, $\theta_c t$ are county-specific linear time trends, which are included in some specifications to control for linearly-trending county characteristics, and X_{ct} (in some specifications) captures additional time-varying characteristics of the county, including county demographic composition and controls for employment in high-reporting sectors.[16] Estimates are weighted by the number of children in each county and year.[17] All analyses allow errors to be correlated within counties over time when constructing standard-error estimates.[18]

We begin by estimating separate regressions for each of our general economic indicators—the unemployment rate, the mass layoff rate, the predicted employment rate, and the predicted employment growth rate. Next, we estimate the effects of male and female economic indicators, including both together in the same regression so that the coefficients on each can be inter-

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[15]Because Poisson models are typically thought of as considering counts and not necessarily counts per capita, we note that this model can be expressed alternatively estimating the natural log of the expected count of maltreatment reports while controlling for the population of children and constraining its coefficient to be equal to one.

[16]Results from log-linear specifications are nearly identical. The differences between OLS log-linear models and the count data models arise due to the slight difference in the assumption about the conditional mean. The count models assume $E(Y|X) = exp(X'\beta)$, while the OLS log linear model assumes $E(ln(Y)|X) = X'\beta$. Although those conditional means look similar to one another, Jensen's inequality suggests that the E(F(X) is less than or equal to F(E(X)). This causes the count models to be more sensitive to outlier observations than the OLS log-linear model. Thus, we proceed using a poisson specifications due to the inherent count nature of our data.

[17]Unweighted specifications generate results that are similar in magnitude to our main results.

[18]In so doing, we are relaxing the Poisson model's typical assumption of equality between the conditional mean and variance.

preted as the effects of changes in labor market conditions facing one gender, holding labor market conditions for the opposite gender constant. Because the difference between the male and female economic indicators might depend on the overall state of the local economy, we also show results in which we include controls for the county unemployment rate in our gender-specific regressions. Finally, because it is possible that changes in the male and female mass layoff rates and predicted employment growth rates may be driven by changes in the relevant "at-risk" populations, we also estimate models in which we control for predicted male and female employment levels when estimating the effects of these variables.

5 Results

5.1 Estimates for Indicators of Overall Economic Conditions

Table 2 contains estimates of the effects of changes in overall economic conditions on maltreatment reports (all reports, abuse reports, and neglect reports). We present results from three specifications: baseline models controlling only for county and year fixed effects; models that additionally control for demographics and employment in high-reporting sectors; and models that additionally control for county-specific linear trends.

In Panel A, we find evidence that the unemployment rate is negatively related to reports of maltreatment, with similar point estimates regardless of the inclusion of additional controls. The estimates suggest a one percentage point increase in the unemployment rate is associated with a 2.1–2.4 percent decline in the reported maltreatment rate, as the estimated coefficients from the Poisson regressions can be interpreted as semi-elasticities. When we focus on abuse, we find point estimates that are small in magnitude and not statistically significant (the point estimates range from -0.001 to 0.004 depending on the specification). The models that focus on neglect produce point estimates that suggest a one percentage point increase in unemployment would decrease

neglect from 2.2 to 2.7 percent, but these estimates also lack precision. These findings are similar to, though smaller in magnitude than, the results of Raissian (2015) who also finds a negative association between unemployment rates and child maltreatment referral rates at the county level in New York, with larger negative effects on neglect than on abuse.

Across panels B through D, which consider the plausibly exogenous economic indicators that we constructed instead of the unemployment rate, the results tell a different story. There is some evidence of effects when we consider the mass layoff measure, which notably suggests effects in the opposite direction as our analysis unemployment rates. However, this estimate is not robust to the inclusion of additional control variables. The estimates considering our measures of predicted employment and employment growth rates also show no clear evidence that demand-induced changes in labor market conditions affect child maltreatment. This could possibly imply that endogeneity is driving some of the relationship between unemployment rates and child maltreatment in Panel A, or that there is not sufficient meaningful variation in these measures at the county level to identify any association.

5.2 Estimates Focusing on Gender-Specific Economic Indicators

In Table 3 we allow for separate effects of economic shocks that disproportionately affect males and females. Here, the pattern of results from our preferred model is quite interesting. Across all three sets of plausibly-exogenous gender-specific explanatory variables, the estimates suggest that male employment is negatively associated with rates of child maltreatment while female employment is positively associated with rates of child maltreatment. In Panel A, a one percentage point increase in the male mass layoff rate, holding the female mass layoff rate constant, is associated with a 3.7 to 6.0 percent increase in maltreatment reports, with even larger effects on abuse and neglect specifically. Meanwhile, a one percentage point increase in the female mass layoff rate is associated up to a 6.5 percent *decrease* in maltreatment reports, though

the size of the effect varies across specifications and outcome variables. Results in Panels B and C show robust positive effects of female predicted employment and employment growth on maltreatment reports, and opposite-signed effects of male predicted employment and employment growth.

The similarity of the patterns across panels in Table 3 is especially notable because there are dramatic differences in the sources of variation that are identifying the effects. Another interesting feature of these results is that the magnitudes suggest that an additional layoff per adult has a slightly larger effect on maltreatment than an additional employed person per adult. This is perhaps not surprising, since the effects of mass layoffs are likely to be concentrated among a less-educated segment of the labor market, who are greater at-risk of child maltreatment to begin with.

In order to consider whether gender-specific employment levels have different effects from gender-specific flows into and out of employment, Table 4 simultaneously considers the effects of predicted employment levels and mass layoff rates (in Panel A) and predicted employment levels and predicted employment growth (in Panel B).[19] Results from these models closely resemble those from the previous models that included these economic measures independently. Again, our richest specifications indicate that male predicted employment reduces maltreatment while male layoffs increase rates of maltreatment. Meanwhile, female economic conditions are again consistently estimated to have the opposite effect, wherein increased female employment is associated with more maltreatment and more female mass layoffs are associated with less maltreatment. The estimates corresponding to the employment growth rate measures are more modest but exhibit the same pattern.

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[19]Panel B can also be thought of as addressing the concern that the gender-specific mass layoff rates reflect changes in the populations of men and women "at risk" for employment gain/loss (i.e., changes in the number of employed workers).

5.3 Economic Conditions and Substantiated Maltreatment

One potential issue with our analysis thus far is the possibility that economic conditions might have effects on *reports* of maltreatment that is independent of effects on actual cases of maltreatment. If this is the case, then the estimates of the effects of economic conditions on maltreatment reports may not provide an accurate characterization of the determinants of maltreatment. Thus far, we have addressed this issue by including controls for county employment in high-reporting sectors: education, health care, social services, and police. An alternative approach, which others in the literature have used, is to focus instead on the counts of child maltreatment reports that have been substantiated by child welfare services. This strategy is also potentially problematic, in that the likelihood that child welfare service agencies will substantiate reports, and the speed with which they do so, may be determined by unobservable factors (such as resource constraints) that may respond independently to changes in local economic conditions. Nonetheless, we confirm in Table 5 that the patterns shown in our main results are largely similar if we instead focus on substantiated reports.

6 Possible Mechanisms

As discussed in Section 2.2, there are a wide variety of mechanisms through which economic conditions might affect child maltreatment. In this section, we revisit these potential mechanisms in light of our findings, which suggest that improvements in labor market conditions for males reduce child maltreatment whereas improvements in labor market conditions for females increase child maltreatment. We begin with an extensive consideration of the link between parental employment and time spent with children.

6.1 Parental Employment and Time With Children

A theoretical framework that builds on family-time-use models (such as Lundberg 1985, Killingsworth and Heckman 1987, and Stephens 2002) and acknowledges differential risks associated with a child's time spent with different caregivers can explain our main results.[20] Recall from Section 2.1 that males are more likely to commit child abuse, while females are more likely to commit (or at least to be held responsible for) child neglect. As such, if increases in male employment causes children to spend less time with their fathers and more time with their mothers, rates of both types of maltreatment could decrease. Similarly, if increases in female employment (and reductions in female layoffs) cause children to spend *less* time with mothers and more time with fathers, they could be associated with increases in both types of maltreatment.

Of course, whether this explanation is compelling depends on the extent to which parental employment actually relates to parental time use in such a manner. In particular, if this mechanism is truly at work, then we should observe that fathers spend less time with children when they are employed and more time with children when their spouses are employed. Similarly, we should observe that mothers spend less time with children when they are employed and more time with children when their spouses are employed. We test these predictions using repeated cross-sections of the American Time Use Survey (ATUS) from 2003 to 2011.[21]

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[20]We forgo presenting a formal the theoretical model along these lines in this paper because the value added would be negligible. Prior theoretical models have established that both own employment status and partner's employment status are likely to affect an individual's time use. In particular, family-time-use models suggest that a worker who is laid off will increase time in non-market activities (e.g., childcare, leisure, or, more generally, "home production") while his or her partner increases time spent in the labor market to make up for the lost household income. The point we make here is simply that such changes in time allocation could have mechanical effects on child maltreatment.

[21]In related work, both Fox, Han, Ruhm, and Waldfogel (2012) and Colman and Dave (2011) are informative about the effects of parental employment and time spent with children. In particular, Fox et al. (forthcoming) demonstrate that parents working full time spend less time than nonworking parents in primary childcare activities. And Colman and Dave (2011) demonstrate that own-gendered employment rates (at the state level) are associated with less time in childcare and opposite-gender employment rates are associated with

The ATUS provides information on the activities that an individual performed during a 24-hour period.[22] Moreover, the ATUS asks who else was around during each activity. As such, we can separately consider time spent with children around, time spent with children around but no spouse around, and time spent performing childcare activities. All of these measures are meant to serve as proxies for childcare responsibilities. For our purposes, we focus on surveyed individuals who are currently living with a spouse or partner in a household with a child under age 18. This restriction leads to a sample of approximately 13,000 fathers and 15,000 mothers. Notably, the fathers and mothers in the sample come from different households because the ATUS only surveys one individual per household.

Our analysis considers how own employment status and spouse's employment status relate to the amount of time that an individual spends with children.[23] At the same time, we acknowledge that neither own employment status nor spouse's employment status are exogenous. A nice feature of the ATUS that should help us to mitigate omitted variable bias is the fact that the ATUS sample is drawn from individuals surveyed in the Current Population Survey (CPS) and is conducted two-to-five months following the CPS. This feature of the data allows us to control flexibly for the economic circumstances of the family a few months prior to the time-use survey. In our richest specification, we control for the triple interaction of the individual's employment status in the CPS survey, the spouse's employment status in the CPS survey, and the income category for their annual family income reported in the CPS survey.[24]

Table 6 separately reports means for the sample of fathers and the sample of mothers. These statistics demonstrate the dramatic difference in mothers'

more time in childcare. For our purposes, however, it is important to separately consider males and females. In addition, we want to consider broader measures of time spent with children since abuse can occur while parents are together with children outside of primary childcare activities. This is an especially important consideration given that time spent performing primary childcare activities represents only 20 percent of father's time spent with children and only 28 percent of mother's time spent with children.

[22]We omit from the sample time-use surveys that correspond to holidays.

[23]Note that the ATUS does not distinguish between individuals who are unemployed and individuals who are not in the labor force.

[24]The ATUS provides incomes in 16 different categories.

and fathers' time spent with children. On average, mothers spend 385 minutes per day with children whereas fathers spend 251 minutes with children; mothers spend 229 minutes of alone time with children whereas fathers spend 87 minutes of alone time with children; and mothers spend 109 minutes in primary childcare whereas fathers spend 54 minutes in primary childcare. These statistics also highlight the fact that primary childcare activities represent only a small share of parental time with children.

Columns 1 through 3 of Table 7 focus on a father's time with children as a function of his own employment status and his spouse's employment status. Each of these columns control for survey year fixed effects and day of week fixed effects. Column 2 additionally controls for a rich set of demographic characteristics for the individual and his spouse.[25] Column 3 presents estimates from our preferred specification which controls flexibly for the economic circumstances of the family a few months prior to the time-use survey.[26] Columns 4 through 6 are structured similarly but instead focus on a mother's time with children as a function of her own employment status and her spouse's employment status. Panels A, B, and C separately consider time spent with children, time spent alone with children, and time spent in primary childcare activities.

These estimates consistently indicate that employment is associated with less time spent with children, for both fathers and mothers. Moreover, consistent with models of family time use, the estimates also demonstrate that having a spouse who is employed is associated with more time spent with children. Notably, all prior studies that have considered the extent to which there are "added worker effects" have focused on the labor supply of wives since

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[25]Specifically, this column controls for age fixed effects, spouse's age fixed effects, educational attainment (less than high school, exactly high school, some college, or four-or-more years of college) fixed effects, spouse's educational attainment fixed effects, race (white, black, or other) and ethnicity (Hispanic or non-Hispanic) fixed effects, spouse's race and ethnicity fixed effects, state fixed effects, age of youngest child fixed effects, and household size fixed effects.

[26]Specifically, this column controls for the triple interaction of the individual's employment status, spouse's employment status, and prior year family income at the time of the CPS, in addition to fixed effects for the industry, occupation, and hours usually worked for the individual and the spouse (with additional categories created for these variables for those who were not working at the time of the CPS).

working-age men tend to be very strongly attached to the labor market and, thus, may have little scope to change their allocation of time between market work and home production. That said, while women's time spent with children is much more sensitive to their spouses' employment status than men's time spent with children, our estimates suggest that men's time spent with children *is* affected by their wives' employment status. In particular, the estimates indicate that having a wife who is employed is associated with 29 percent more time alone with children.[27]

Overall, these results support the idea that the distribution of childcare may be a key mechanism linking economic conditions and child abuse. They suggest that father's employment results in children spending less time with fathers and more time with mothers, whereas a mother's employment results in children spending less time alone with fathers and more time with mothers. Negative employment shocks would have the opposite effects. Although we have tried to address potential confounders with a model that controls for a rich set of covariates, we cannot rule out the possibility that other unobservables may be contributing to the estimates. As such, we think of these estimates as "proof of concept" that the impacts of male and female employment on child maltreatment that we document can be explained by their impacts on childcare.

6.2 Other Mechanisms

Though our discussion thus far has emphasized parental time use and the differential risks associated with children's time spent with fathers and mothers, there are many other mechanisms that may contribute to the estimated effects of male and female labor market conditions on child maltreatment. In

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[27]To better match the variation used in our analysis of mass layoffs at the county level, we have also estimated specifications focusing solely on variation induced by transitions out of employment by omitting from the sample any families in which an individual or an individual's spouse transitions into employment between the Current Population Survey and the American Time Use Survey. In addition, we have examined the relationship between parental employment and time spent with children in "non-traditional families," defined as households with unmarried partners, step-children, and foster children. Results from these analyses, shown in the Appendix, are similar to our main estimates.

particular, many factors associated with layoffs may have direct impacts on individuals' propensity to abuse or neglect children, and it is possible that the role of these factors differs by gender.

Income is a known correlate of child maltreatment, and it is possible that the size of the income shocks associated with changes in labor market conditions for male and female are different. However, both male and female employment should be positively associated with family income, and both male and female layoffs should cause family income to fall, so it is unlikely that this mechanism could explain the opposite-signed effects of male and female labor market indicators that we find.

Mental health is another known correlate of child abuse and neglect that could help to explain a link between economic conditions and maltreatment rates. Mental health may be a particularly salient consideration when considering the effects of layoffs, which are a stressful negative employment shock. In particular, if deteriorating mental health increases an individual's propensity to abuse or neglect their children, then effects of economic conditions on mental health should generate corresponding effects on maltreatment rates. However, while it is possible that male layoffs may have *greater* impacts on mental health than female layoffs (perhaps due to larger shocks to family income), there is no evidence to suggest that female layoffs *reduce* household stress. In fact, the existing literature suggests that both male and female layoffs have significant effects on smoking (Black, Devereux, and Salvanes 2012), suicide (Eliason and Storrie 2009a) and alcohol abuse (Eliason and Storrie 2009b).

Family structure is another appealing mechanism to consider given evidence that job loss increases the incidence of divorce (Charles and Stephens Jr 2004, Eliason 2012, Doiron and Mendolia 2011). In fact, there are several possible reasons that an increased divorce rate could increase the rate of child maltreatment. First, divorce may increase parents' stress levels and lead to increased mental health problems and substance abuse. Second, divorce may increase children's exposure to unrelated adults, and in particular unrelated males, who are responsible for disproportionate shares of child abuse (Sedlak,

Mettenburg, Basena, Peta, McPherson, Greene, et al. 2010). Third, divorce increases a child's likelihood of living with a single parent, and thus may increase the likelihood of neglect for financial reasons or because of lack of quality childcare options. That said, because both male and female layoffs increase the incidence of divorce (Charles and Stephens Jr 2004, Eliason 2012), this mechanism is also unlikely to explain the asymmetric effects we find.

Motivated by Aizer (2010), we might think that the link between economic conditions and abuse is driven by changes in household bargaining power. In particular, Aizer (2010) finds that increases in female wages relative to male wages reduces domestic violence against females. Since females are usually the primary caregivers, we might expect child maltreatment, and abuse in particular, to follow a similar pattern. That is, this view of the household would lead us to expect that female employment (and male layoffs) should increase women's bargaining power and thus reduce child abuse while male employment (and female layoffs) should decrease women's bargaining power and thus increase abuse. However, our findings are not consistent with these predictions.

Finally, we might think that economic conditions affect *reported* abuse through impacts on the rate at which abuse is reported. Though we have taken steps to address this potential source of bias empirically by controlling for employment in the highest-reporting sectors, we can never be sure that it has been fully addressed. That said, it is hard to imagine how male layoffs would increase the rate at which abuse is reported and female layoffs would reduce the rate at which abuse is reported, especially when we have controlled for employment in the highest-reporting sectors.

In summary, though some of these other mechanisms may play a role in the link between economic conditions and child abuse, we think they are unlikely to play as large a role as parental time use, which provides a straightforward explanation for our main results when one considers the differential risks associated with children's time spent with different childcare providers.

7 Conclusion

In this paper, we explore the relationship between various measures of aggregate economic conditions and child maltreatment, with an emphasis on gender. In so doing, we make several contributions to the literature on child maltreatment. We offer a more convincing analysis of the effects of local economic conditions by considering plausibly exogenous economic indicators and we explore the importance of local economic shocks that disproportionately affect on one gender. Our results suggest a potential explanation for why "the estimated effect of local economic conditions" varies so much across prior studies: different types of local economic shocks have different effects on child maltreatment. On average, overall economic conditions appear to be only weakly related to child maltreatment. However, downturns that disproportionately affect men increase maltreatment whereas downturns that disproportionately affect females reduce abuse (while positive shocks have the opposite effects). An overarching lesson from this study is that we should not think about "income" in the context of child maltreatment without considering its source. Moreover, the pattern of estimated effects on maltreatment—and our supporting analysis of time use—suggests that childcare provision may play a pivotal role in determining how economic shocks affect child maltreatment.

Our results have several implications for policy. In particular, they suggest that child maltreatment may be reduced by targeting employment search assistance, childcare subsidies, and mental-health services to displaced household heads. Though gender-specific policies may not be politically feasible, this sort of gender-neutral policy would primarily affect males and thus could reduce maltreatment. In addition, these results can be used by authorities to plan for the aftermath of economic shocks. Finally, it is important to note that reducing abuse can serve the broader goal of improving the health of children from disadvantaged families and limiting the intergenerational transmission of poverty and violence.

We view this work as a step towards thinking about the link between economic conditions and child abuse in a new way, acknowledging that much

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work remains to be done on the topic. In addition to bringing new data sources to bear on the research question, it will be important for future work to consider differential impacts on abuse committed by mothers and fathers and to examine whether the effects are disproportionate for any particular groups of children.

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Figure 1

Abuse Rate and Neglect Rate, California 1998-2012
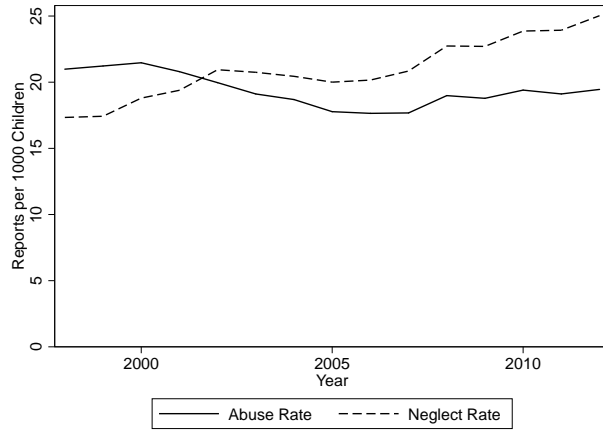
Notes: Abuse and neglect counts are from the California Child Welfare Indicators Project, a collaboration between the University of California Berkeley and the California Department of Social Services. Child population counts (ages 0-17) are from the National Cancer Institute's Surveillance, Epidemiology, and End Results (SEER) program.

Figure 2

Unemployment Rate and Mass Layoff Rate, California 1998-2012
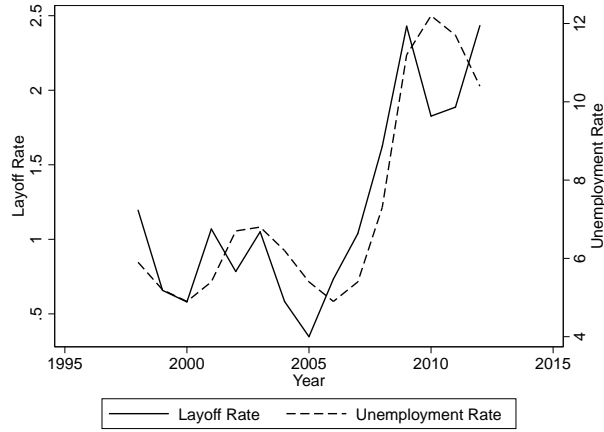
Notes: Unemployment rates are produced directly by the Bureau of Labor Statistics (BLS). Mass layoff rates are calculated by dividing the count of individuals involved in a mass layoff event, obtained from the BLS, by the adult population between the ages of 18 and 65, obtained from the National Cancer Institute's Surveillance, Epidemiology, and End Results (SEER) program.

Figure 3
Variation in Gender-Specific Economic Indicators in the Pooled Data

Panel A: Mass Layoffs

Panel B: Predicted Employment

Panel C: Predicted Employment Growth
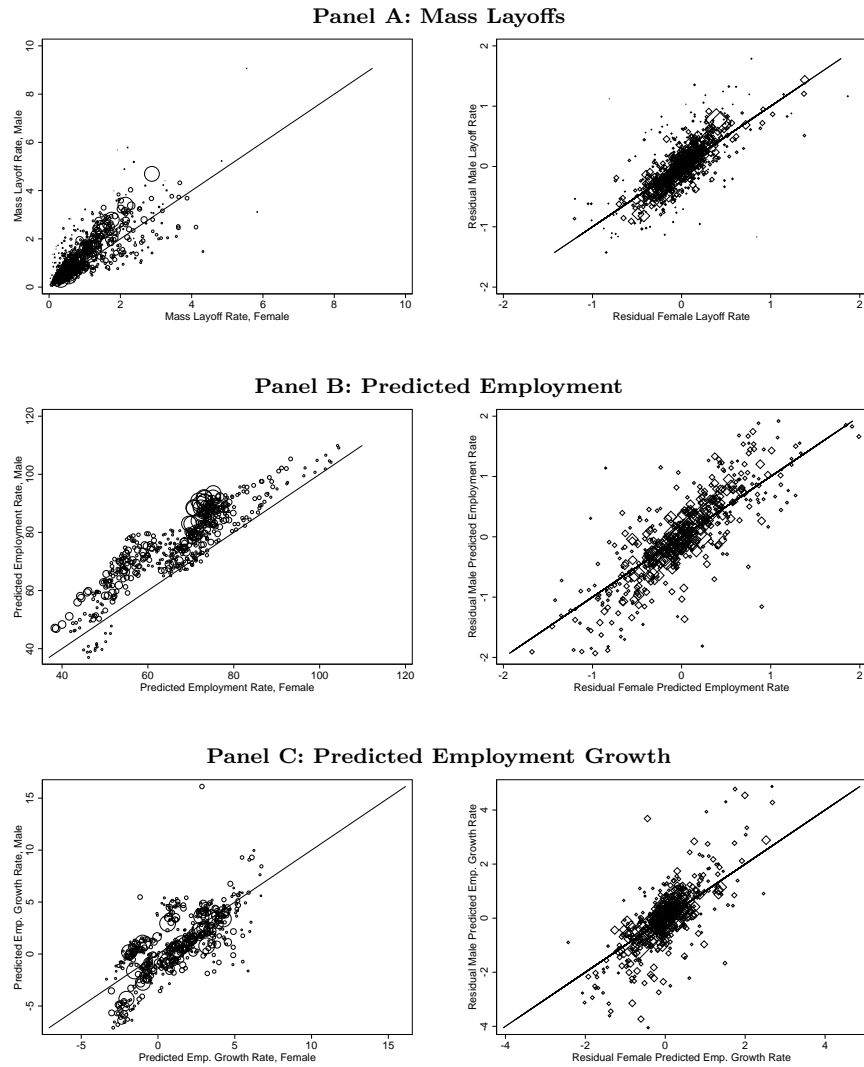
Notes: This figure displays scatterplots of gender-specific economic indicators for counties in CA 1998-2012. Construction of the variables is described in section 3.2. The figures on the left display raw data (weighted by population) while the figures on the right display residuals after controlling for county and year fixed effects, county-specific linear time trends, county demographic composition, and employment in high-reporting sectors. N=817 in Panel A and N=510 in Panels B and C.

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Table 1

Sample Means for Child Maltreatment, Economic Conditions, and Demographics
in California

|	Observations	Mean
Maltreatment Reports per 1000 Children	817	52.28
Abuse Reports per 1000 Children	817	19.89
Neglect Reports per 1000 Children	817	21.46
Unemployment Rate	817	7.54
Mass Layoff Rate	817	1.20
Predicted Employment Rate	510	73.54
Predicted Employment Growth Rate	510	0.90
Male Mass Layoff Rate	817	1.37
Female Mass Layoff Rate	817	1.02
Male Predicted Employment Rate	510	79.42
Female Predicted Employment Rate	510	67.63
Male Predicted Employment Growth Rate	510	0.75
Female Predicted Employment Growth Rate	510	1.10
Fraction Black	817	0.07
Fraction Hispanic	817	0.36
Fraction Other Race/Ethnicity	817	0.13
Fraction Age 0-5	817	0.09
Fraction Age 6-12	817	0.10
Fraction Age 13-17	817	0.08
Fraction Age 18-29	817	0.18
Fraction Age 30-39	817	0.15
Fraction Age 40-49	817	0.15
Fraction Age 50-59	817	0.12
School Employment per 1000 Adults	570	3.79
Hospital Employment per 1000 Adults	413	19.96
Social Services Employment per 1000 Adults	702	5.74
Police Employment per 1000 Adults	817	4.72

Notes: Abuse and neglect counts are from the California Child Welfare Indicators Project, a collaboration between the University of California Berkeley and the California Department of Social Services. Population counts and demographic controls are from the National Cancer Institute's Surveillance, Epidemiology, and End Results (SEER) program. Unemployment rates and mass layoff counts are obtained from the Bureau of Labor Statistics (BLS). Construction of predicted employment variables is described in Section 3.2 (these variables are only available for the 34 largest counties due to restrictions on the public use census data). Employment in schools, hospitals, and social services is from the US Census Bureau's County Business Patterns database. Police employment is from the Uniform Crime Report's Law Enforcement Officers Killed and Assaulted (LEOKA) database.

Table 2

Economic Conditions and Child Maltreatment Reports in California

Panel A: Unemployment Rate

	Maltreatment Reports			Abuse Reports			Neglect Reports		
Unemployment Rate	-0.024	-0.023	-0.021	-0.001	0.004	0.002	-0.024	-0.027	-0.022
	(0.010)	(0.008)	(0.008)	(0.016)	(0.013)	(0.013)	(0.016)	(0.017)	(0.022)
County Controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
County Linear Trends	No	No	Yes	No	No	Yes	No	No	Yes

Panel B: Mass Layoff Rate

	Maltreatment Reports			Abuse Reports			Neglect Reports		
Mass Layoff Rate	0.055	0.021	0.018	0.089	0.049	0.012	0.037	0.027	0.058
	(0.020)	(0.012)	(0.013)	(0.030)	(0.017)	(0.014)	(0.036)	(0.026)	(0.023)
County Controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
County Linear Trends	No	No	Yes	No	No	Yes	No	No	Yes

Panel C: Predicted Employment Rate

	Maltreatment Reports			Abuse Reports			Neglect Reports		
Predicted Employment Rate	0.014	0.009	-0.004	0.018	0.001	-0.006	0.001	-0.015	-0.012
	(0.004)	(0.008)	(0.006)	(0.007)	(0.007)	(0.010)	(0.006)	(0.010)	(0.016)
County Controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
County Linear Trends	No	No	Yes	No	No	Yes	No	No	Yes

Panel D: Predicted Employment Growth Rate

	Maltreatment Reports			Abuse Reports			Neglect Reports		
Predicted Employment Growth Rate	0.001	-0.000	-0.004	0.000	-0.001	-0.005	-0.000	0.001	-0.004
	(0.006)	(0.005)	(0.004)	(0.008)	(0.007)	(0.005)	(0.008)	(0.008)	(0.005)
County Controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
County Linear Trends	No	No	Yes	No	No	Yes	No	No	Yes

Notes: N=817 in Panels A and B and N=510 in Panels C and D. Robust standard errors which allow for clustering at the county level are shown in parentheses. Significance at 1%, 5%, 10% levels are indicated by ***, **, and *, respectively. County controls include fraction black, fraction Hispanic, and fraction other race/ethnicity (nonwhite), and the fractions of the population in each of eight age groups: 0-5, 6-12, 13-17, 18-29, 30-39, 40-49, 50-59. For data sources, see Table 1 notes.

Table 3
Male and Female Economic Conditions and Child Maltreatment Reports in California

Panel A: Mass Layoff Rates

	Maltreatment Reports			Abuse Reports			Neglect Reports		
Male Mass Layoff Rate	0.037 (0.021)	0.033 (0.020)	0.060 (0.012)	0.082 (0.034)	0.097 (0.031)	0.042 (0.023)	0.073 (0.032)	0.065 (0.020)	0.091 (0.027)
Female Mass Layoff Rate	0.012 (0.035)	-0.022 (0.030)	-0.065 (0.015)	-0.015 (0.058)	-0.083 (0.054)	-0.046 (0.028)	-0.066 (0.046)	-0.063 (0.036)	-0.061 (0.037)
County Controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
County Linear Trends	No	No	Yes	No	No	Yes	No	No	Yes
P-value (test male est. = female est.)	0.630	0.263	0.000	0.270	0.031	0.069	0.052	0.012	0.012

Panel B: Predicted Employment Rates

	Maltreatment Reports			Abuse Reports			Neglect Reports		
Male Predicted Employment Rate	-0.017 (0.011)	-0.014 (0.010)	-0.032 (0.008)	-0.019 (0.023)	-0.031 (0.018)	-0.045 (0.013)	-0.025 (0.018)	-0.030 (0.022)	-0.043 (0.025)
Female Predicted Employment Rate	0.038 (0.016)	0.028 (0.013)	0.044 (0.014)	0.045 (0.031)	0.039 (0.026)	0.060 (0.019)	0.033 (0.023)	0.022 (0.026)	0.054 (0.036)
County Controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
County Linear Trends	No	No	Yes	No	No	Yes	No	No	Yes
P-value (test male est. = female est.)	0.045	0.051	0.000	0.232	0.110	0.000	0.153	0.272	0.098

Panel C: Predicted Employment Growth Rates

	Maltreatment Reports			Abuse Reports			Neglect Reports		
Male Predicted Employment Growth Rate	-0.004 (0.005)	-0.004 (0.004)	-0.009 (0.003)	0.008 (0.011)	0.001 (0.007)	-0.003 (0.005)	-0.011 (0.004)	-0.009 (0.004)	-0.007 (0.004)
Female Predicted Employment Growth Rate	0.010 (0.006)	0.010 (0.006)	0.013 (0.005)	-0.017 (0.016)	-0.004 (0.011)	-0.001 (0.008)	0.030 (0.009)	0.027 (0.009)	0.011 (0.007)
County Controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
County Linear Trends	No	No	Yes	No	No	Yes	No	No	Yes
P-value (test male est. = female est.)	0.178	0.101	0.002	0.312	0.727	0.811	0.001	0.002	0.090

Notes: N=817 in Panel A and N=510 in Panels B and C. Robust standard errors which allow for clustering at the county level are shown in parentheses. Significance at 1%, 5%, 10% levels are indicated by ***, **, and *, respectively. County controls include fraction black, fraction Hispanic, and fraction other race/ethnicity (nonwhite), and the fractions of the population in each of eight age groups: 0-5, 6-12, 13-17, 18-29, 30-39, 40-49, 50-59. For data sources, see Table 1 notes.

Table 4

Male and Female Economic Conditions and Child Maltreatment Reports, Combined Regressions

Panel A: Mass Layoff Rates and Predicted Employment Rates

	Maltreatment Reports			Abuse Reports			Neglect Reports		
Male Predicted Employment Rate	-0.014 (0.010)	-0.014 (0.010)	-0.036 (0.009)	-0.011 (0.020)	-0.027 (0.018)	-0.048 (0.014)	-0.021 (0.017)	-0.028 (0.022)	-0.051 (0.026)
Female Predicted Employment Rate	0.036 (0.014)	0.030 (0.013)	0.051 (0.014)	0.037 (0.027)	0.038 (0.026)	0.066 (0.021)	0.029 (0.022)	0.022 (0.026)	0.069 (0.037)
Male Mass Layoff Rate	0.049 (0.021)	0.036 (0.022)	0.079 (0.011)	0.110 (0.037)	0.092 (0.037)	0.052 (0.029)	0.068 (0.031)	0.059 (0.023)	0.113 (0.029)
Female Mass Layoff Rate	0.007 (0.034)	-0.017 (0.031)	-0.080 (0.015)	-0.044 (0.063)	-0.075 (0.062)	-0.050 (0.036)	-0.053 (0.049)	-0.048 (0.037)	-0.072 (0.043)
County Controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
County Linear Trends	No	No	Yes	No	No	Yes	No	No	Yes
P-value (test male MLR est. = female MLR est.)	0.432	0.299	0.000	0.115	0.083	0.109	0.103	0.054	0.008
P-value (test male PER est. = female PER est.)	0.035	0.055	0.000	0.307	0.138	0.001	0.199	0.289	0.047

Panel B: Predicted Employment Growth Rates and Predicted Employment Rates

	Maltreatment Reports			Abuse Reports			Neglect Reports		
Male Predicted Employment Rate	-0.017 (0.012)	-0.013 (0.012)	-0.030 (0.011)	-0.022 (0.024)	-0.034 (0.020)	-0.051 (0.018)	-0.024 (0.019)	-0.030 (0.025)	-0.048 (0.031)
Female Predicted Employment Rate	0.037 (0.017)	0.027 (0.014)	0.040 (0.014)	0.048 (0.033)	0.043 (0.027)	0.067 (0.021)	0.031 (0.023)	0.020 (0.029)	0.057 (0.041)
Male Predicted Employment Growth Rate	-0.002 (0.005)	-0.002 (0.005)	-0.003 (0.004)	0.010 (0.011)	0.008 (0.008)	0.007 (0.008)	-0.006 (0.004)	-0.004 (0.007)	0.002 (0.007)
Female Predicted Employment Growth Rate	0.007 (0.007)	0.005 (0.007)	0.008 (0.005)	-0.021 (0.017)	-0.012 (0.014)	-0.010 (0.009)	0.025 (0.008)	0.025 (0.009)	0.005 (0.010)
County Controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
County Linear Trends	No	No	Yes	No	No	Yes	No	No	Yes
P-value (test male MLR est. = female MLR est.)									
P-value (test male PER est. = female PER est.)	0.065	0.118	0.002	0.226	0.097	0.001	0.186	0.349	0.138

Notes: N=817 in Panel A and N=510 in Panel B. Robust standard errors which allow for clustering at the county level are shown in parentheses. Significance at 1%, 5%, 10% levels are indicated by ***, **, and *, respectively. County controls include fraction black, fraction Hispanic, and fraction other race/ethnicity (nonwhite), and the fractions of the population in each of eight age groups: 0-5, 6-12, 13-17, 18-29, 30-39, 40-49, 50-59. For data sources, see Table 1 notes.

Table 5

Male and Female Economic Conditions and *Substantiated* Maltreatment

Panel A: Mass Layoff Rates and Predicted Employment Rates

	Maltreatment Reports		Abuse Reports		Neglect Reports	
Male Predicted Employment Rate	-0.057 (0.017)	-0.052 (0.014)	-0.089 (0.038)	-0.068 (0.022)	-0.080 (0.024)	-0.088 (0.020)
Female Predicted Employment Rate	0.095 (0.025)	0.070 (0.016)	0.162 (0.054)	0.079 (0.033)	0.083 (0.029)	0.125 (0.035)
Male Mass Layoff Rate	0.102 (0.024)	0.063 (0.026)	0.165 (0.060)	0.116 (0.066)	0.122 (0.034)	0.075 (0.034)
Female Mass Layoff Rate	0.015 (0.052)	-0.020 (0.055)	-0.058 (0.118)	-0.141 (0.096)	-0.050 (0.050)	0.002 (0.049)
County Controls	No	Yes	No	Yes	Yes	Yes
County Linear Trends	No	Yes	No	Yes	No	Yes
P-value (test male MLR est. = female MLR est.)	0.229	0.330	0.205	0.101	0.030	0.360
P-value (test male PER est. = female PER est.)	0.000	0.000	0.006	0.006	0.002	0.000

Panel B: Predicted Employment Growth Rates and Predicted Employment Rates

	Maltreatment Reports		Abuse Reports		Neglect Reports	
Male Predicted Employment Rate	-0.061 (0.021)	-0.048 (0.018)	-0.107 (0.042)	-0.081 (0.026)	-0.074 (0.029)	-0.070 (0.028)
Female Predicted Employment Rate	0.096 (0.034)	0.062 (0.020)	0.180 (0.061)	0.092 (0.035)	0.068 (0.033)	0.096 (0.044)
Male Predicted Employment Growth Rate	-0.001 (0.009)	-0.005 (0.008)	0.024 (0.023)	0.011 (0.018)	-0.007 (0.007)	-0.006 (0.007)
Female Predicted Employment Growth Rate	0.000 (0.017)	0.003 (0.014)	-0.058 (0.039)	-0.031 (0.031)	0.019 (0.015)	0.008 (0.016)
County Controls	No	Yes	No	Yes	Yes	Yes
County Linear Trends	No	Yes	No	Yes	Yes	Yes
P-value (test male PEGR est. = female PEGR est.)	0.969	0.703	0.171	0.371	0.155	0.537
P-value (test male PER est. = female PER est.)	0.004	0.003	0.005	0.004	0.019	0.017

Notes: N=817 in Panel A and N=510 in Panel B. Robust standard errors which allow for clustering at the county level are shown in parentheses. Significance at 1%, 5%, 10% levels are indicated by ***, **, and *, respectively. County controls include fraction black, fraction Hispanic, and fraction other race/ethnicity (nonwhite), and the fractions of the population in each of eight age groups: 0-5, 6-12, 13-17, 18-29, 30-39, 40-49, 50-59. For data sources, see Table 1 notes.

Table 6

Table 6

Sample Means from the American Time Use Survey

	Fathers' Time Use Sample	Mothers' Time Use Sample
Minutes With Children	251.03	385.33
Minutes Alone With Children	87.12	229.44
Minutes Primary Childcare	54.13	109.34
Father is Employed	0.90	0.90
Father Employed in CPS Survey	0.90	0.90
Mother is Employed	0.64	0.62
Mother Employed in CPS Survey	0.65	0.60
Father's Age	39.60	39.67
Mother's Age	37.52	37.30
Father is White	0.85	0.84
Father is Black	0.08	0.06
Father is Other Race	0.07	0.07
Father is Hispanic	0.19	0.19
Mother is White	0.84	0.87
Mother is Black	0.07	0.06
Mother is Other Race	0.07	0.07
Mother is Hispanic	0.19	0.20
Father's Education < HS	0.13	0.13
Father's Education = HS	0.29	0.27
Father Has Some College	0.24	0.28
Father Has 4+ Years College	0.34	0.35
Mother's Education < HS	0.11	0.12
Mother's Education = HS	0.24	0.26
Mother Has Some College	0.32	0.26
Mother Has 4+ Years College	0.37	0.36
Age of Youngest Child	6.52	6.43
Household Size	4.27	4.29
Observations	12985	15456

Notes: Data are from the the American Time Use Survey, 2003-2011. The sample is limited to individuals living with a spouse or partner in a household with a child under the age of 18. Estimates are weighted using ATUS sampling weights.

Table 7

Parental Employment Status And Parents' Time Spent With Children
Evidence from the American Time Use Survey

	Father's Time With Children			Mother's Time With Children		
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Minutes With Children Around						
Father is Employed	-62.280	-100.274	-96.636	76.144	37.545	24.824
	(9.896)	(9.195)	(12.008)	(9.211)	(8.018)	(10.055)
Mother is Employed	-8.995	1.900	-0.796	-173.503	-143.206	-117.476
	(4.822)	(4.629)	(7.382)	(5.148)	(4.660)	(7.845)
Observations	12985	12985	12980	15456	15456	15451
Demographic Controls	no	yes	yes	no	yes	yes
Prior-Economic-Circumstances Controls	no	no	yes	no	no	yes
Panel B: Minutes Alone With Children						
Father is Employed	-47.824	-62.056	-52.953	85.836	59.537	50.452
	(6.981)	(6.889)	(8.815)	(6.920)	(6.511)	(8.067)
Mother is Employed	30.966	33.703	25.626	-131.865	-115.215	-95.007
	(3.285)	(3.012)	(4.390)	(4.503)	(4.133)	(6.954)
Observations	12985	12985	12980	15456	15456	15451
Demographic Controls	no	yes	yes	no	yes	yes
Prior-Economic-Circumstances Controls	no	no	yes	no	no	yes
Panel D: Minutes Doing Primary Childcare						
Father is Employed	-21.354	-36.167	-25.253	30.365	9.946	7.726
	(4.015)	(3.785)	(5.331)	(3.824)	(3.395)	(4.162)
Mother is Employed	3.248	8.053	4.997	-62.109	-52.386	-38.802
	(2.306)	(1.966)	(3.715)	(2.549)	(2.334)	(4.103)
Observations	12985	12985	12980	15456	15456	15451
Demographic Controls	no	yes	yes	no	yes	yes
Prior-Economic-Circumstances Controls	no	no	yes	no	no	yes

Notes: Data are from the the American Time Use Survey, 2003-2011. The sample is limited to individuals living with a spouse or partner in a household with a child under the age of 18. All columns control for survey year fixed effects and day of week fixed effects. The estimates in columns 2 and 5 additionally control for age fixed effects, spouse's age fixed effects, educational attainment (less than high school, exactly high school, some college, or four-or-more years of college) fixed effects, spouse's educational attainment fixed effects, race (white, black, or other) and ethnicity (Hispanic or non-Hispanic) fixed effects, spouse's race and ethnicity fixed effects, state fixed effects, age of youngest child fixed effects, and household size fixed effects. Columns 3 and 6 use employment and income information from the CPS, taken two to five months prior to the time use survey. In particular, it incorporates controls for the triple interaction of the individual's employment status, spouse's employment status, and prior year family income at the time of the CPS, in addition to fixed effects for the industry, occupation and hours usually worked for the individual and the spouse (with additional categories created for these variables for those who were not working at the time of the CPS). Estimates are weighted using ATUS sampling weights. Heteroskedastic-robust standard errors are shown in parentheses.
Significance at 1%, 5%, 10% levels are indicated by ***, **, and *, respectively.

Table A1
Parental Employment Status And Parents' Time Spent With Children
Evidence from the American Time Use Survey
Only Considering Employment to Non-employment Transitions

	Father's Time With Children			Mother's Time With Children		
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Minutes With Children						
Father is Employed	-61.176	-101.798	-111.834	77.782	38.692	14.872
	(10.140)	(9.413)	(17.127)	(9.430)	(8.134)	(13.610)
Mother is Employed	-10.793	0.445	-4.459	-178.001	-145.871	-129.643
	(4.931)	(4.768)	(10.243)	(5.297)	(4.772)	(11.607)
Observations	12060	12060	12058	13853	13853	13850
Demographic Controls	no	yes	yes	no	yes	yes
Prior-Economic-Circumstances Controls	no	no	yes	no	no	yes
Panel B: Minutes Alone With Children						
Father is Employed	-47.879	-63.441	-55.229	85.717	58.619	43.191
	(7.134)	(7.002)	(12.535)	(7.177)	(6.745)	(10.984)
Mother is Employed	31.065	33.351	26.628	-134.794	-115.862	-106.181
	(3.359)	(3.139)	(5.647)	(4.646)	(4.238)	(11.073)
Observations	12060	12060	12058	13853	13853	13850
Demographic Controls	no	yes	yes	no	yes	yes
Prior-Economic-Circumstances Controls	no	no	yes	no	no	yes
Panel C: Minutes Doing Primary Childcare						
Father is Employed	-22.910	-38.795	-27.890	29.378	8.469	2.816
	(4.128)	(3.838)	(6.932)	(3.940)	(3.468)	(5.386)
Mother is Employed	3.356	8.333	6.754	-64.401	-54.268	-38.578
	(2.299)	(2.001)	(5.408)	(2.618)	(2.374)	(6.295)
Observations	12060	12060	12058	13853	13853	13850
Demographic Controls	no	yes	yes	no	yes	yes
Prior-Economic-Circumstances Controls	no	no	yes	no	no	yes

Notes: The sample omits families in which a spouse changes from being unemployed to being employed between the CPS and ATUS surveys. For additional notes, see Table 7.
Significance at 1%, 5%, 10% levels are indicated by ***, **, and *, respectively.

Table A2

Parental Employment Status And Parents' Time Spent With Children

Evidence from the American Time Use Survey

Only Considering Non-traditional Couples

	Father's Time With Children			Mother's Time With Children		
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Minutes With Children						
Father is Employed	-87.065	-110.994	-195.279	58.656	59.054	53.455
	(31.367)	(29.446)	(50.098)	(24.009)	(22.631)	(45.993)
Mother is Employed	-40.648	-12.338	-16.123	-190.278	-137.395	-106.308
	(24.072)	(20.577)	(43.455)	(20.126)	(20.064)	(46.180)
Observations	872	872	872	955	955	955
Demographic Controls	no	yes	yes	no	yes	yes
Prior-Economic-Circumstances Controls	no	no	yes	no	no	yes
Panel B: Minutes Alone With Children						
Father is Employed	-58.144	-81.444	-101.749	53.853	59.920	60.853
	(22.957)	(21.619)	(42.218)	(21.232)	(19.765)	(39.700)
Mother is Employed	23.075	49.094	24.428	-142.758	-98.079	-68.132
	(21.052)	(14.627)	(33.917)	(18.163)	(16.250)	(35.178)
Observations	872	872	872	955	955	955
Demographic Controls	no	yes	yes	no	yes	yes
Prior-Economic-Circumstances Controls	no	no	yes	no	no	yes
Panel C: Minutes Doing Primary Childcare						
Father is Employed	-20.335	-49.293	-69.571	11.687	3.868	8.127
	(13.041)	(13.057)	(24.012)	(11.775)	(10.547)	(19.198)
Mother is Employed	-11.123	6.948	44.820	-74.040	-47.143	-50.641
	(13.360)	(9.461)	(16.319)	(9.168)	(9.898)	(22.120)
Observations	872	872	872	955	955	955
Demographic Controls	no	yes	yes	no	yes	yes
Prior-Economic-Circumstances Controls	no	no	yes	no	no	yes

Notes: The sample is limited to families in which the respondent lives with an unmarried partner and household containing stepchildren or foster children. The sample is restricted to 2007-2011 when this information is available. For additional notes, see Table 7.
Significance at 1%, 5%, 10% levels are indicated by ***, **, and *, respectively.