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Why Is Mommy So Stressed? Estimating the Immediate Impact of the COVID-19 Shock on Parental Attachment to the Labor Market and the Double Bind of Mothers

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Estimating the Immediate Impact of the COVID-19 Shock on Parental Attachment to the Labor Market and the Double Bind of Mothers

By MISTY L. HEGGENESS*

I examine the impact of the COVID-19 shock on parents' labor supply during the initial stages of the pandemic. Using difference-in-difference estimation and monthly panel data from the Current Population Survey (CPS), I compare labor market attachment, non-work activity, hours worked, and earnings and wages of those in areas with early school closures and stay-in-place orders with those in areas with delayed or no pandemic closures. While there was no immediate impact on detachment or unemployment, mothers with jobs in early closure states were 53.2 percent more likely than mothers in late closure states to have a job but not be working as a result of early shutdowns. There was no effect on working fathers or working women without school age children. Of mothers who continued working, those in early closure states worked more weekly hours than mothers in late closure states; fathers reduced their hours. The increase in hours worked of mothers is entirely driven by mothers living with spouses who were not working. Overall, the pandemic appears to have induced a unique immediate juggling act for working mothers of school age children.

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I. Introduction

The COVID-19 pandemic brought economic markets to their knees. Entire industries completely shut down in many parts of the country, along with schools and daycare facilities. Many working parents lost their jobs or were forced to work from home, simultaneously balancing work and childcare responsibilities while their kids transitioned to online learning and home schooling. Even parents with in-home nannies were forced to provide around-the-clock care for their children as stay-at-home orders and social distancing became the new norm.

Parents everywhere stepped up; they are the unsung heroes of this crisis. Moms in particular went into multitask mode with color-coordinated home-school schedules that attempted to track and organize what their kids would be doing each hour of the weekday. Many of these schedules went viral on social media. Moms do, after all, have a reputation for being the queen bees of multitasking. But one has to ask: How much can we pack onto parents' backs before they break?

Pop culture and news media have circulated stories about the negative impact of this pandemic on parents, and mothers in particular, describing stories of harried and exhausted women attempting to hold down the house, oversee their kids' schooling, and manage their own work. In the parenting section of the *New York Times*, an article asked if the new pandemic will change anything regarding home and work for mothers. It shared a story of a woman who admitted that if either she or her husband had to quit his or her job to take care of the children, it would be her since she earns less than him (Bennett 2020). Another news story from National Public Radio highlighted what it called "grotesque" gender inequalities for household work during the pandemic and the double bind faced by many working women with families (Gross 2020). At the same time, new preliminary research is highlighting that while mothers spend more time engaged in childcare

than fathers, fathers have been performing more domestic childcare tasks relative to mothers during the current crisis (Sevilla and Smith 2020).

While media stories like these and research on gender inequality in household production are not new or uncommon (Luscombe 2017, Carpenter 2018, Hinchliffe 2019, Sayer & Pepin 2019, Cain Miller 2020), a question remains as to whether and to what extent they held up for a majority of mothers (or parents) during the initial shock of the pandemic shutdown. Early work by Alon, Doepke, Olmstead-Rumsey, & Tertilt (2020a, 2020b) discusses anticipated implications of the pandemic on labor market outcomes for men and women, arguing that women would be disproportionately affected by the economic downturn because service and related sectors are dominated by women's employment and school and daycare closures would increase household work. They highlight the particularly vulnerable position of single working parents due to COVID-19 restrictions, identify longer term macroeconomic implications of the gendered impact of COVID-19 on the labor market, and provide evidence suggesting the possibility of a more equitable balance by gender post-pandemic driven by dads engaging in higher levels of childcare during the pandemic.

Other studies also hint at the unique impact of the pandemic on mothers' labor supply (Barkowski, McLaughlin, & Dai 2020; Collins, Landivar, Ruppanner, & Scarborough 2020; Landivar, Ruppanner, Scarborough, & Collins 2020). Collins et al. (2020) use monthly panel data to examine trends in hours worked in early months, finding that mothers in dual-career couples reduced hours worked in the late spring compared to the first few months of the year. Barkowski et al. (2020) compare labor supply of working parents to both working adults without children and working parents with childcare support at home and finding some evidence that working mothers increased hours worked.

In this paper, I examine the immediate impact of the shutdown, which led to an unanticipated exogenous shift in work environments, household chores, and

childcare responsibilities. I test the effect the shutdown had on the labor supply of parents. Using state-level variation in the timing of school closings and stay-at-home orders, I study the extent to which increased domestic responsibilities for parents shifted their work habits in ways unparalleled to other working adults without children. Did parents receive an additional penalty in the workplace? Were they more or less likely to detach from the labor market at the start of the pandemic? Did mothers and fathers experience the immediate impact differently?

More broadly, I use a natural experiment, the COVID-19 shock, to ask what life would be like for working parents, particularly mothers, if care for their children outside the household did not exist. Would their labor supply shift (at least in the short run)? Would they detach from labor markets, take leave from work, or use some other mechanism to cope with their new reality?

II. Background

The research from the 1990s on mothers' joint decision-making regarding work and childcare focuses on young mothers and the relevance of childcare. Blau and Robins (1991) showed that young mothers in particular "appear to respond to [economic and demographic] changes by altering their labor supply and childcare behavior" (p. 333). Young mothers experience volatile episodes of moving in and out of the labor force, influenced to some extent by other adults moving in and out of the household and the availability of babysitters or other childcare arrangements. These mothers enter and exit the labor market at a higher frequency than others and are influenced by childcare availability. In another study from around the same time, Berger and Black (1992) showed that in Kentucky, mothers who received childcare support were more likely to work, but the support had little effect on hours worked. They found that the availability of subsidies for quality childcare increased mothers' labor supply. Looked at another way, those

without a childcare subsidy for quality care of their children were less likely to be engaged in employment.

A decade later, a study by Powell (2002) built on this evidence, showing that mothers are jointly sensitive to the price of childcare and wages in making choice decisions to labor market entry. More recent studies using natural experiments have found that childcare availability and affordability matter for workforce attachment, but with mixed results. Agüero and Marks (2008) used infertility shocks to estimate the effect of children on women's labor supply, finding that there was generally no effect. Lefebvre and Merrigan (2008) use a natural experiment of childcare subsidies in Canada to show that the availability of affordable childcare has a statistically significant impact on the labor supply of mothers with preschool-age children.

In this paper, I am less interested in testing the already established (although slightly mixed) literature on the joint decisions of mothers regarding childcare and work. Instead, I test whether the complete and unexpected cutoff to school had an immediate impact on parents' engagement with the workforce. I compare parents in early shutdown states with other parents in states that shut down late or not systematically at all. More generally, the policy question asked here is: If a generalized space for child supervision and learning is taken away, what happens to the labor supply of parents? How do they adjust? Do mothers adjust differently than fathers? How important is it for parents to have a safe space for children to grow and learn every day while they work? In today's environment stressing gender equality in the workforce, does a dramatic shift in household production responsibilities still hinder mothers' engagement with labor markets more than fathers'? What can we learn from this pandemic? The answers to these questions have broad policy implications beyond the current pandemic and touch on how society supports and adapts to the childcare and schooling needs of working parents—in particular, as these measures relate to policy goals like the Federal

Reserve's full employment mandate. I provide additional evidence that childcare and schooling are not just essential for the human capital development of our youth; they are also critical policy interventions for the full employment of parents, especially mothers.

III. Methodology and Data

A. Standard Household Utility Model

To fix ideas, I start with a basic household model (Becker 1981) where the family maximizes one (additive) household utility function subject to typical budget and time constraints (24 hours in a day with a minimum amount of time needed for sleep and dependent children care). This standard utility function includes time in work, leisure, childcare, and sleep. In normal times, parents have the option to do the childcare themselves as unpaid labor or pay another entity or person for childcare. A rational parent will choose to work in the formal labor market and pay for childcare if the cost of childcare is less than what the parent earns at his or her job. Exceptions to this exist if, for example, the parent's utility or intrinsic value of doing the childcare him- or herself is higher than the parent's reservation wage or the wage he or she could earn in the formal labor market. Under this model, an exogenous shift in time allocation and resources due to the COVID-19 pandemic forces parents to realign their limited resources to meet the basic needs of their children (and themselves) in a different way – particularly with respect to childcare.

B. Hedonic Marriages, Household Bargaining, and Gendered Preferences

While one can assume today that many dual-earning couples are in hedonic marriages sharing consumption preferences rather than household production complementarities (Stevenson & Wolfers 2007), exogenous changes in household

responsibilities under a national crisis are bound to shift bargaining over resources and household tasks. The traditional model discussed above assumes one decision-making parent. Under the hedonic preferences assumption, the model can easily be extended for households with more than one parent. Even if parents have hedonic preferences, however, an extension of this simple model toward a more realistic bargaining model allows for intrahousehold bargaining to occur (Manser & Brown 1980; McElroy & Horney 1981; Lundberg & Pollak 1993, 1994, 1996). In particular, whether or not parents have similar consumption preferences, during a pandemic they still bargain over who takes on the additional chores and childcare responsibilities.

Prior research has given ample evidence demonstrating that adults within a household bargain for resources and that shifting resources can influence household consumption patterns (Lundberg et al. 1996, Voena 2015, Wong 2016, Heggeness 2020a). Research has also shown that on average, mothers tend to shift more resources toward children's education, clothes, and other household goods than fathers when they control resources (Lundberg et al. 1996, Quisumbing & Maluccio 1999, Rubalcava et al. 2004, Rangel 2006, Rosero & Schady 2007, Nunley & Seals 2011, Heggeness 2020a). An extension of this artifact in the current situation is that during a national crisis that closes schools, mothers will invest more of their own time and resources into home schooling, childcare, and domestic tasks than fathers (Sevilla & Smith 2020). One would be concerned about equality in the household if, for example, more mothers shift out of the labor market to assume childcare responsibilities, especially if they do not return to the labor market.

C. Juggling It All: Pandemic Household Bargaining

Time spent in non-paid childcare activities and household production tasks increases for parents when schools are closed and stay-at-home ordinances are enforced. Even if parents are willing to outsource childcare under normal circumstances, doing so is not an option in a national crisis like COVID-19. Children under age 18 need varying levels of general supervision. While younger, non-school age children require more direct and intense supervision, school age children require additional supervision of activities associated with a new world of online schooling. These increased non-paid childcare activities by nature induce a decrease in time spent in other activities—for example, paid labor or leisure. In the short run, hourly wages are assumed exogenous and should not change, even though one's time spent working (and therefore one's total earnings) might.

Many working parents lost employment because their employer shut down and they had jobs for which remote work was not feasible (e.g., waitresses or retail clerks). Although these parents now had additional time to take on more childcare tasks, a reduced income combined with these new household responsibilities, may have decreased overall wellbeing and consumption. For parents for whom remote work was feasible, work hours shifted. Hours were either reduced to compensate for the increased childcare responsibilities or increased if there was a need to compensate for lost income of other working age adults in the household. An equally plausible outcome is that their work hours may not have changed if there was another adult in the household who was able to take on the additional responsibilities of childcare and supervision of pandemic schooling. Either way, for all parents, balancing increased household production activities with work could increase stress, reduced sleep and leisure time, or induce a decrease (or increase) in work hours and work productivity. If these shifts took place within a

household bargaining framework, those with less bargaining power would acquire the majority of the additional domestic tasks.

In the analysis below, I test for the impact of additional parenting responsibilities on short-run parental labor supply. For mothers and fathers, I look at both the extensive margin (employment) and the intensive margin (hours worked). In the short run, I expect the effect to reduce working parents' employment, and for those who stay attached to the labor market, I expect to see a sharp decline on the intensive margin of hours worked. All of this assumes that childcare and helping children with online schooling imply that parents either shift their time in other activities or increase involvement in multiple activities at once. I expect to see a sharper decline in mothers' employment and hours worked compared with those of fathers for two reasons. First, on average, mothers carry a heavier burden of childcare responsibilities in the household and are more willing to invest in household production (Lundberg et al. 1996, Quisumbing & Maluccio 1999, Rubalcava et al. 2004, Rangel 2006, Rosero & Schady 2007, Nunley & Seals 2011, Heggeness 2020a). Second, prior studies have shown that in around 70 percent of married couple households, wives are the lower earning spouse (Winkler et al. 2005, Murray-Close & Heggeness 2019), and lower earning spouses would leave the labor market to care for children before higher earning spouses would (Bennett 2020).

D. Data

I use monthly panel data from the Integrated Public Use Microdata Series, Current Population Survey (IPUMS-CPS) (Flood et al. 2020).¹ The CPS is a monthly survey annually administered to approximately 60,000 households.

¹ Full replication files including the data and code are publicly available here: <https://doi.org/10.5281/zenodo.3893241> (Heggeness 2020b).

Respondents enter the survey in month t and answer the survey consecutively in months t , $t+1$, $t+2$, and $t+3$. They then move to an out round of the survey for eight months, during which they do not respond to survey questions. They reenter at $t+12$ and are in the survey for $t+12$, $t+13$, $t+14$, and $t+15$ before they exit the survey entirely. Each month, during the week including the 19th, data are collected in field and questions are asked referencing the week prior—that is, the week containing the 12th. The survey is fielded primarily via telephone. However, households in t and $t+12$ months of their survey are interviewed in person, as are households that cannot be reached via telephone in other months.²

The CPS asks questions about household members' economic activity, education, demographics, and program participation. In addition, each month, special topic modules are included. This survey design and its topic coverage are ideal for this analysis because they include workforce, sociodemographic, and household data on the same individuals before and during the initial stage of the pandemic. It has questions on hours worked the previous week, reasons why one is absent from work, and other relevant questions on economic activity, as well as details about other members of the household. I construct an unbalanced panel for the months of January, February, March, April, and May of 2019 and 2020.

To the IPUMS-CPS dataset, I append data on the date of school closures and stay-at-home ordinances (Appendix Table 1). I divide the school closure data into two categories: schools that closed early and those that closed late. I use the week including March 12th as the cutoff for states closing early. By the following week, most states began closing, either because they were following the lead of the earlier states or because it became clear the pandemic was a nationwide crisis.

² While telephone interviews were not disrupted during stay-at-home ordinances, in-person interviews were halted halfway through data collection in March, and they were not conducted at all in April, resulting in a drop of more than 10 percent in response rates during those months.

The timing of the CPS data collection fits nicely within this timeframe. The monthly survey asks its respondents (during the week of the 19th) about their experiences from the prior week (that of the 12th). This allows me to discern which households were immediately affected by school closings before or during the reference period in question and which were not (but would soon be in the following weeks).

The full nationally representative sample includes 393,969 individuals (1,135,548 observations over the first five months of 2019 and 2020). After cleaning the panel, I delete around 33,000 observations because of inconsistencies in the panel person-link relating to age, sex, or race. Group quarter observations and children under age 15 are excluded. I then drop individuals not in the universe or with missing data for the employment status outcome variables. The final analysis sample includes 885,456 observations from 309,382 unique individuals aged 15 or older (Table 1). The final analysis sample of parents of school age children includes 269,547 observations from 95,064 unique parents.

Parents of infants and toddlers face more complicated joint decisions around work and childcare since no universal childcare system exists in the United States; parents who work must have sufficient resources to pay for private care. Because public schooling is mandatory and universal in the U.S., all parents of school age children had care for their children during school hours before the shutdown (and then did not). I focus the parental analysis on parents of school age children because the decisions between work and childcare are, in some sense, clearer.³

³ In a series of robustness checks found in Appendix Table 2, I show that for parents with any child under age 18 (Models 1 and 2), the results are less in magnitude but similar to the main findings of this paper: mothers took leave in early closure states, fathers did not. There is no effect on women without children.

E. Estimation Methods

Two factors drive changes in labor hours or employment during a pandemic: external circumstances influenced by a shutdown and related to the employer (changes in labor demand) or internal household circumstances that affect the employee’s ability to work (changes in labor supply)—for example, becoming sick, providing childcare, or related reasons. The change in labor demand during the current pandemic is driven by an external health shock to everyone and is not caused by individual employers alone. The impact would be felt equally across all households, conditional on the type of industry and job for which the labor was supplied. I assume the demand of labor is constant or changing at a similar rate for everyone, conditional on type of industry, job, and labor in states as they became exposed to closure ordinances. Assuming the general shift in the demand for labor was standard for all, I disentangle the additional impact on the labor supply of parents, and mothers in particular, by running the analyses described below.

$$(1) \quad y = \beta_1 \text{early} + \beta_2 \text{year} + \beta_3 (\text{early} \cdot \text{year}) + \gamma_{\text{month}} + \mu + \varepsilon.$$

I start with a standard difference-in-difference equation (Equation 1). I compare individuals from early-closure and late-closure states in 2019 and 2020 along six outcome variables. Specifically, I compare states that had school closures announced during or before the week including March 12th with those with announcements the following week or later (or none at all). I include monthly controls to account for seasonal trends and individual-level fixed effects (μ) to handle any unobserved variation at the individual-level.

The outcome variables (y) are (i) not in the labor force (detached), (ii) unemployed conditional on being in the labor force, (iii) not working the prior

week conditional on being employed, (iv) hours worked the prior week conditional on being employed, (v) weekly earnings from the prior week conditional on being employed, (vi) hourly wage from the prior week conditional on being employed. Outcome variables (i)–(iii) provide a general measure of the impact of school closures and stay-at-home orders on the extensive margin of labor (staying in the labor force). Outcome variables (iv)–(vi) provide a more nuanced effect at the intensive margin on the amount of labor provided and the value of that labor.

In this model, β_1 is the general effect associated with living in an early closure state. β_2 is the overall effect on the outcome in 2020, compared with 2019. β_3 is the coefficient of interest as it reports the specific effect of the early closure policy regime on the immediate impact of the outcome variable compared to those who were not exposed to early intervention. In general, since closures had a large and intense impact on work, I would expect the effect of early closures, β_3 , to be significant on most outcome variables except wages, which are considered exogenous in the short run.

$$(2) y = \beta_1 \text{early} + \beta_2 \text{year} + \beta_3(\text{early} \cdot \text{year}) + \gamma_{\text{month}} + \mu_{\text{nadults}} + \theta_{\text{educ}} + \alpha_{\text{industry}} + \mu + \varepsilon$$

A difference-in-difference estimation differences out time invariant factors like age and race. However, any time variant characteristics that differ by treatment group may confound the true effect on the outcome variables if they are not explicitly accounted for. To adjust for time variant changes in household and individual characteristics, I include controls for the presence of least one other working age adult in the household, educational attainment, and industry of employment (Equation 2).

Household decisions regarding how and when to engage with the labor market are influenced by multiple factors. Perhaps the most salient, however, is whether there is another working age adult in the household. During a time of crisis when the household must provide its own childcare, households with only one working adult face a different set of choices than households where there is at least one other working age adult. Because of this and the fact that household composition can change with time, I include a control variable for whether there is another working age adult in the household. Educational attainment can also change with time, and so I include controls for it. Finally, I include industry controls because the shutdown had major across-the-board differential effects by industry. For example, all retail stores shut down, but roofing companies were allowed to remain open as an essential service.

Women experience the labor market differently than men, in terms of type of employment, amount of labor supplied, and wages and earnings received. To account for this, I run Equation (2) separately for women and men. In these cases, I am comparing women in early closure states with their counterparts in late closure states; I do the same for men. To the extent that school closures and shutdowns had an adverse effect on women (or men) due to bargaining decisions within the household, we would expect to see the impact through the β_3 coefficient. If intrahousehold bargaining does not influence interactions with labor markets during a major, complete shutdown early on, then the effect on both men and women should be similar in early and late closure states.

Next, to account for the additional impact of school closings on parents, I run Equation (2) separately for mothers and fathers, defined as women and men living with at least one own child between the ages of six and seventeen. This analysis allows for the comparison of the impact on mothers in early closure states with that on mothers in late closure states. The same is true for fathers. Here, differential impacts on β_3 between mothers and fathers indicate both shifts in

intra-household bargaining and the differential impacts of mothers and fathers' labor market participation due to childcare and household responsibilities.

$$(3) y = \beta_1 \text{early} + \beta_2 \text{year} + \alpha_1 \text{sex} + \beta_3 (\text{early} \cdot \text{year}) + \alpha_2 (\text{early} \cdot \text{sex}) + \alpha_3 (\text{year} \cdot \text{sex}) + \alpha_4 (\text{early} \cdot \text{year} \cdot \text{sex}) + \gamma_{\text{month}} + \mu_{\text{adults}} + \theta_{\text{educ}} + \alpha_{\text{industry}} + \varepsilon$$

Equation (3) is a difference-in-difference-in-difference (“triple diff”) estimation. It is similar to Equation (2) but includes a gender interaction term on the full analytical sample and the reduced sample of parents, instead of separate regressions on subsamples by gender. Equation (3) tells us the general effect of early closures overall, β_3 , and early closures' additional effect on women or mothers relative to men or fathers, α_4 . If mothers (or fathers) do not carry an additional burden of childcare and household production responsibilities, α_4 should be small and insignificant. If α_4 is positive and significant, mothers either exhibited less bargaining power than fathers by carrying the weight of the additional domestic responsibilities or have preferences that align with a desire to take on the additional domestic tasks. If α_4 is negative and significant, then fathers did.

IV. Analysis

In the immediate response to the pandemic, there appears to have been no short-term impact on detachment from the labor force (Table 2). Model 1 shows a significant impact of the early closures; however, once I control for other adults, education, and industry, the significance goes away. There was no significant difference for women or men, nor were there any significant differences between mothers or fathers in early and late closure states. These results could be driven by the fine granularity of the timing of the school closures and stay-at-home

orders. It was not yet apparent in the initial stages of the pandemic that the stay-at-home orders would linger for months.

In terms of unemployment (Table 3), early closures had no effect on unemployment for anyone. At the very beginning of the pandemic, the magnitude and duration of the closures was still unclear. Because of this, employers may not have let their staff go during the initial days of the pandemic. It was only after the reality set in with regard to the nationwide effect and magnitude that those employers officially began furloughing and laying off staff. Given the granularity with which the data are divided into early and late closures (in many cases, the difference is only a matter of days), the fact that employers may have had a delayed reaction, and the amount of time it takes to apply for and receive unemployment, these results make sense. In fact, there have been numerous media reports describing the difficulties in applying for unemployment in the initial stages of the pandemic.

More interesting, perhaps, is the rate with which those with a job began taking temporary leave (Table 4). Those in early closure states were 20.0 percent more likely to take leave and 20.3 percent more likely after controlling for other adults, education, and industry. That rate, however, appears to be driven solely by mothers who temporarily stopped working. Women in early closure states were 31.9 percent more likely to stop working the prior week compared with women in late closure states. There was no statistically significant difference for men. Mothers who maintained jobs in early closure states were 53.2 percent more likely than mothers in late closure states to not be working.⁴ In other words,

⁴ As a robustness check, I rerun the analysis on women with any children under age 18 in the household (Appendix Table 2, Model 1) and the magnitude is weaker for mothers, 32.2 percent ($p < 0.05$). There is no significant effect on fathers (Appendix Table 2, Model 2). To check if the effect is driven solely by mothers of school age children, I also run the analysis on women with no school age children in the house (Appendix Table 2, Model 4). While the estimate is 19.7 percent, it is statistically insignificant. I also run a check that excludes any college age siblings or possible grandparents who might take off work to care for other siblings or grandchildren (Appendix Table 2, Model 5). Here I also find no

mothers in early closure states saw a more than 50 percent increase in taking leave from work. There was no significant difference in leave time between fathers from early closure and late closure states.

The impact on short-term work productivity and engagement appeared to be borne entirely on the backs of mothers. This gendered result is surprising given recent efforts towards gender equality within society at large. However, most efforts toward gender equality focus on activities outside the household, including formal labor market participation and advancing more women in positions of political influence. More recent reports, however, have continued to document a persistence of gendered inequalities in domestic tasks within the household (Luscombe 2017, Carpenter 2018, Hinchliffe 2019, Sayer & Pepin 2019, Cain Miller 2020).

Interestingly, mothers in early closure states who continued working that week experienced an increase in hours worked, compared with their late closure states counterparts (Table 5). Average hours worked in the previous week increased by 1.0 percent for mothers in early closure states compared with other mothers. Fathers' hours decreased by 1.4 percent in early closure states compared with fathers in late closure states. Overall, mothers increased their hours by 2.4 percent in early closure states compared with fathers. One plausible explanation for this finding is that mothers who increased hours worked did so to compensate for other household members' lost wages or reduced hours worked.

To test this hypothesis, I ran the same regressions on a subset of mothers living with a spouse and divided the sample based on whether the spouse was actively working or not the previous week. The results are in Appendix Table 3. They show that for the subset of mothers living with a spouse, the increase in hours

effect. These robustness checks help confirm that the impact of the school closure on leave time from work was driven by mothers taking time off to care for their children during the crisis.

worked is entirely driven by mothers whose spouse was not working the previous week (Model (1)). Mothers living with a non-working spouse increased their work hours by 4.9 percent. There is no increase in hours worked for mothers living with an actively working spouse (Model (2)), nor do I find any significant increase in hours worked for mothers not living with a spouse (Model (3)). Mothers who increased hours worked appear to be doing so to compensate for a non-working spouse. In these cases, the non-working spouse may be taking up additional household and childcare responsibilities.

The situation for mothers is complex. They experienced one of two paths: either taking temporary leave to care for children or increasing work hours to compensate for a non-working spouse. The immediate impact on labor market outcomes experienced by mothers during the COVID-19 closures does not appear to have been experienced by fathers. For mothers, path one leaves them vulnerable to career scarring as research has shown, for example, that men in the bottom half of the earnings distribution who experienced a decline in hours worked during recession-years exhibit scarring on future career outcomes that exacerbated income inequality over time (Heathcote & Perri 2020). Those with the flexibility to take leave probably have higher earnings than those whose job does not allow for leave. However, when mothers must take leave for childcare purposes during a national crisis while their colleagues continue working, it has detrimental effects on opportunities for career advancement and leaning in at work.

Path two for mothers has the potential to lead to more gender equality within the household and at work if (1) non-working fathers are picking up more household and childcare responsibilities at home, and (2) more hours at work equates to more opportunities to engage with managers, participate in important work projects, and continue promotional advancements within the workplace. Path two is in line with the assumptions and evidence provided by Alon et al (2020a,

2020b) that suggests once we move beyond this pandemic, gender equality within the household and other areas of life may actually improve.

As expected, there was no immediate impact on hourly wages (Table 7), which are assumed exogenous in the short run. Even though mothers who worked increased the average number of hours worked the prior week (Table 5), it appears to have had no effect on their earnings from that week (Table 6). A likely answer to this puzzle is that it was higher earning salaried mothers who worked more hours without additional pay. However, that argument contradicts the idea that mothers worked more hours to compensate for a non-working spouse. Two other scenarios are plausible. First, mothers earning lower wages could have increased their hours during school closures while mothers earning higher (non-salaried) wages decreased hours in a manner that resulted in a net zero sum change in average weekly earnings. Mothers with higher wages may have had more flexibility to take temporary non-paid leave to care for small children. Second, mothers could have increased their hours worked out of a socially desirable preference to demonstrate to their employer their dedication to work under a scenario where their employer knew they were working from home next to their children. However, this scenario on its own would still indicate an increase in earnings unless the mothers engaged in this behavior were salaried employees. This is an area for future investigation.

Finally, because it is possible that other characteristic differences between states that closed early and those that closed late are driving these results, even after controlling for important time variant elements like having another working adult in the household, educational attainment, and industry, I conduct a robustness check on the results to test whether this may be true. I rerun the analysis on the not-working outcome variable using data only from January and February 2020—months that occur before major shutdowns driven by COVID-19. Table 8 shows that there is no significant difference between early and late closure states in the

months before the pandemic for any of the groups. These results provide additional assurance that the original analysis correctly identifies the immediate impact of school closures and stay-at-home ordinances rather than other characteristic differences between the two state groups.

V. Conclusion

While advancements have been made over recent decades regarding women's rights, wage equality, and participation in formal labor markets, this pandemic has made it clear that something has got to give. Moms are trying to juggle multiple responsibilities: the job they get paid to do in the formal labor market alongside the responsibilities of parenting and childcare. In this analysis, I have shown how gender inequality in the domestic sphere of one's life influences inequality outside the household. It is not enough to strive for gender equality in corporate boards and among workforce management, and it is likely that major domestic issues like disruptions in childcare influence the gender wage gap over time. Parents—especially mothers—remain ever vulnerable to the availability of affordable childcare while they work. Without more formal and intentional systems of care, mothers will forever be vulnerable to career scarring during any major crisis like this pandemic or any other event that triggers an increase in domestic tasks within her household.

I do not examine the impact of the collapse of the childcare industry on long-run employment and labor market attachment of mothers, but it is clear that if we expect a future where mothers reach full employment, public discussions should include explicit plans for affordable and comprehensive quality childcare and strong school infrastructure. The consequences of not creating this environment are immediately relevant for at-risk working mothers. Today, around 70 percent of mothers actually work in the formal labor market, compared with over 90

percent of fathers (author's calculations; not shown). Parents, especially mothers, are one of the groups that are most vulnerable to post-pandemic detachment from the labor market. If we do not include their needs in our public policy discussions of post-pandemic full employment, it will be a missed opportunity for the economy and society at large.

If we are ever going to even the playing field for women and parents in the workforce, we need to prioritize discussions of childcare. The economy can never fully open if schools and childcare remain closed. A gender-equal labor market will never be fully realized unless we acknowledge the double bind of mothers and the dual responsibilities of household production and formal labor market activities that are disproportionately distributed toward women, particularly mothers.

A. Limitations

I do not examine the longer-term impact of the pandemic on parental employment. Rather, I assess the immediate impact on parents by using difference-in-difference approaches and variation in state closures, which in some cases occur just days apart from one another. I analyze a limited number of outcomes related to economic activity and labor market attachment. Future research should include an analysis of the pandemic's longer-term impact on labor market attachment and earnings, as well as an analysis of any permanently shifted effects on time use within households in the long run. Will mothers be able to keep their jobs as the pandemic continues and they are continually forced to balance childcare, household production, online schooling, and work? Will they experience scarring from having to disengage from work or multitask work with online schooling oversight for their children? Additionally, what role do fathers play in the intermediate and long term? Larger policy discussions should

address other factors of wellbeing, including mental health, stress, and material wellbeing.

REFERENCES

- Agüero, J. M., & Marks, M. S. (2008). Motherhood and female labor force participation: Evidence from infertility shocks. *American Economic Review: Papers & Proceedings*, 98(2), 500–504.
- Alon T., Doepke, M., Olmstead-Rumsey, J., & Tertilt, M. (2020a). The impact of COVID-19 on gender equality.” NBER Working Paper No. 26947.
- Alon, T., Doepke, M., Olmstead-Rumsey, J. & Tertilt, M. (2020b). This time it's different: The role of women's employment in a pandemic recession.” IZA Discussion Paper No. 13562.
- Barkowski, S. and McLaughlin, J. and Dai, Y. (2020). Young children and parents' labor supply during COVID-19 (July 27). Available at SSRN: <https://ssrn.com/abstract=3630776> or <http://dx.doi.org/10.2139/ssrn.3630776>.
- Becker, Gary S., *Treatise on the family*, Cambridge: Harvard University Press, 1981.
- Bennett, J. (2020). “I feel like I have five jobs”: Moms navigate the pandemic. *New York Times*, March 20. <https://www.nytimes.com/2020/03/20/parenting/childcare-coronavirus-moms.html>. Accessed May 22, 2020.
- Berger, M. C., & Black, D. A. (1992). Child care subsidies, quality of care, and the labor supply of low-income, single mothers. *The Review of Economics and Statistics*, 74(4), 635–642.
- Blau, D. M., & Robins, P. K. (1991). Child care demand and labor supply of young mothers over time. *Demography*, 28(3), 333–351.
- Cain Miller, C. (2020). Young men embrace gender equality, but they still don't vacuum. *New York Times*, The Upshot, February 11. <https://www.nytimes.com/2020/02/11/upshot/gender-roles-housework.html>. Accessed June 10, 2020.

- Carpenter, J. (2018). Millennial women are working more. But they're still doing most of the housework. *CNN Business*, December 26. <https://edition.cnn.com/2018/12/26/success/millennial-women-income/index.html>. Accessed on June 10, 2020.
- Collins, C., Landivar, L.C., Ruppanner, L., Scarborough, W.J. (2020). COVID-19 and the gender gap in work hours. *Gender, Work, & Organization*, 1-12, <https://doi.org/10.1111/gwao.12506>.
- Flood, S., King, M., Rodgers, R., Ruggles, S., & Warren, J. R. (2020). Integrated Public Use Microdata Series, Current Population Survey: Version 7.0 [dataset]. Minneapolis, MN: IPUMS. <https://doi.org/10.18128/D030.V7.0>.
- Gross, T. (2020). Pandemic makes evident “grotesque” gender inequality in household work. *National Public Radio*, May 21. <https://www.npr.org/2020/05/21/860091230/pandemic-makes-evident-grotesque-gender-inequality-in-household-work>. Accessed May 22, 2020.
- Heathcote, J. & Perri, F. (2020). The rise of US earnings inequality: Does the cycle drive the trend? Staff Report No. 604. Minneapolis, MN: Federal Reserve Bank of Minneapolis.
- Heggeness, M. L. (2020a). Improving child welfare in middle income countries: The unintended consequence of a pro-homemaker divorce law and wait time to divorce. *Journal of Development Economics*, 143, 102405.
- Heggeness, M. L. (2020b). Replication file for "Why is mommy so stressed? Estimating the immediate impact of the COVID-19 shock on parental attachment to the labor market and the double bind of mothers. *Zenodo*. <http://doi.org/10.5281/zenodo.3893240>.
- Hinchliffe, E. (2019). Married women do more housework than single moms, study finds. *Fortune*, May 8. <https://fortune.com/2019/05/08/married-single-moms-housework/>. Accessed June 10, 2020.
- Landivar, L. C., Ruppanner, L., Scarborough, W. J., & Collins, C. (2020). Early

- signs indicate that COVID-19 is exacerbating gender inequality in the labor force. *Socius: Sociological Research for a Dynamic World*, 6, 1-3.
- Lefebvre, P., & Merrigan, P. (2008). Child-care policy and the labor supply of mothers with young children: A natural experiment from Canada. *Journal of Labor Economics*, 26(3), 519–548.
- Lundberg, S., & Pollak, R. A. (1993). Separate spheres bargaining and the marriage market. *Journal of Political Economy*, 101(6), 988–1010.
- Lundberg, S., & Pollak, R. A. (1994). Noncooperative bargaining models of marriage. *The American Economic Review*, 84(2), 132–137.
- Lundberg, S., & Pollak, R. A. (1996). Bargaining and distribution in marriage. *Journal of Economic Perspectives*, 10(4), 139–158.
- Luscombe, B. (2017). Fewer young people want gender equality at home. *Time*, March 31. <https://time.com/4718281/fewer-young-people-want-gender-equality-at-home/>. Accessed June 10, 2020.
- Manser, M., & Brown, M. (1980). Marriage and household decision-making: A bargaining analysis. *International Economic Review*, 21(1), 31–44.
- McElroy, M. B., & Horney, M. J. (1981). Nash-bargained household decisions: Toward a generalization of the theory of demand. *International Economic Review*, 22(2), 333–349.
- Murray-Close, M., & Heggeness, M. L. (2019). Manning up and womaning down: How husbands and wives report earnings when she earns more. Opportunity and Inclusive Growth Institute Working Paper No. 28. Minneapolis, MN: Federal Reserve Bank of Minneapolis.
- Nunley, J. M., & Seals, R. A. Jr. (2011). Child-custody reform, marital investments in children, and the labor supply of married mothers. *Labour Economics*, 18(1), 14–24.
- Powell, L. M. (2002). Joint labor supply and childcare choice decisions of married mothers. *The Journal of Human Resources*, 37(1), 106–128.

- Quisumbing, A. R., & Maluccio, J. A. (2000). Intrahousehold allocation and gender relations: New empirical evidence. Discussion paper 84. Washington, DC: International Food Policy Research Institute, Food Consumption and Nutrition Division.
- Rangel, M. A. (2006). Alimony rights and intrahousehold allocation of resources: Evidence from Brazil. *The Economic Journal*, 116(513), 627–658.
- Rosero, J., & Schady, N. (2007). Are cash transfers made to women spent like other sources of income? Policy Research Working Paper No. 4282. Washington DC: World Bank.
- Rubalcava L., Teruel G., & Thomas, D. (2004). Spending, saving, and public transfers paid to women. Working Paper Series CCPR-024-04. Los Angeles, CA: California Center for Population Research/University of California.
- Sayer, L. C., & Pepin, J. R. (2019). Moms spend even more time on housework when a man's in the house. Here's why. *The Washington Post*, May 8. https://www.washingtonpost.com/opinions/moms-spend-even-more-time-on-housework-when-a-mans-in-the-house-heres-why/2019/05/08/319da006-71ba-11e9-8be0-ca575670e91c_story.html. Accessed June 10, 2020.
- Sevilla, A., & Smith, S. (2020). Baby steps: The gender division of childcare during the COVID-19 pandemic." CEPR Discussion Paper No. DP14804. London: Centre for Economic Policy Research.
- Stevenson, B., & Wolfers, J. (2007). Marriage and divorce: Changes and their driving forces. *Journal of Economic Perspectives*, 21(2), 27–52.
- Voena, A. (2015). Yours, mine, and ours: Do divorce laws affect the intertemporal behavior of married couples? *American Economic Review*, 105(8), 2295–2332.
- Winkler, A. E., McBride, T. D., & Andrews C. (2005). Wives who outearn their husbands: A transitory or persistent phenomenon for couples? *Demography*, 42(3), 523–535.

Wong, H. C. (2016). Credible commitments and marriage: When the homemaker gets her share at divorce. *Journal of Demographic Economics*, 82, 241–279.

TABLE 1—DESCRIPTIVE STATISTICS BY PARENTHOOD AND STATE CLOSURE TIMING

<i>Panel A: Total Population Age 15+ and Parents of School Age Children</i>												
	Population Age 15+						Parents of School Age Children					
	Early			Late			Early			Late		
	N	Obs	(%) or Mean	N	Obs	(%) or Mean	N	Obs	(%) or Mean	N	Obs	(%) or Mean
Age	116,648	335,886	48.2 [18.73]	192,734	549,570	48.6 [18.83]	35,946	102,629	48.3 [12.87]	59,118	166,918	48.1 [13.02]
Female	116,648	335,886	52.0 [50.00]	192,734	549,570	52.3 [49.95]	35,946	102,629	56.3 [49.61]	59,118	166,918	56.8 [49.53]
Living with at least One Other Adult	116,648	335,886	36.3 [48.10]	192,734	549,570	35.3 [47.79]	35,946	102,629	49.8 [50.00]	59,118	166,918	49.3 [50.00]
Has at least One Own School-Age Child	116,648	335,886	30.6 [46.06]	192,734	549,570	30.4 [45.98]	35,946	102,629	100.0 [0.00]	59,118	166,918	100.0 [0.00]
Educational Attainment												
Less than High School	116,648	335,886	12.8 [33.39]	192,734	549,570	11.9 [32.44]	35,946	102,629	11.7 [32.17]	59,118	166,918	10.0 [30.00]
High School Diploma or Equivalent	116,648	335,886	44.4 [49.69]	192,734	549,570	45.4 [49.79]	35,946	102,629	42.3 [49.40]	59,118	166,918	42.9 [49.49]
Associates Degree	116,648	335,886	9.6 [29.41]	192,734	549,570	10.2 [30.30]	35,946	102,629	10.9 [31.12]	59,118	166,918	11.6 [32.00]
Bachelor Degree or Higher	116,648	335,886	33.2 [47.10]	192,734	549,570	32.4 [46.81]	35,946	102,629	35.1 [47.72]	59,118	166,918	35.5 [47.86]
Employment Status												
Not in Labor Force	116,648	335,886	38.2 [48.59]	192,734	549,570	38.8 [48.74]	35,946	102,629	26.6 [44.21]	59,118	166,918	25.9 [43.80]
Unemployed	76,548	207,611	5.1 [22.02]	125,799	336,178	5.0 [21.89]	27,322	75,290	4.5 [20.63]	45,548	123,698	4.0 [19.52]
Employed, Not Working Prior Week	73,089	196,065	3.7 [18.83]	120,537	319,216	3.7 [18.82]	26,387	71,937	3.4 [18.19]	44,112	118,789	3.3 [17.92]
Of Those Working...												
Hours Worked Last Week	71,694	188,564	38.3 [13.01]	118,322	307,480	38.7 [13.12]	25,945	69,471	39.7 [12.35]	43,398	114,842	40.0 [12.36]
Earnings Last Week	37,730	45,245	\$1,067.30 [743.20]	61,870	73,763	\$1,007.18 [703.21]	13,632	16,452	\$1,160.01 [757.71]	22,729	27,246	\$1,111.94 [724.96]
Hourly Wage	22,284	25,550	\$19.43 [11.01]	36,510	41,577	\$18.74 [10.61]	7,652	8,755	\$20.97 [11.83]	12,346	14,056	\$20.32 [11.38]
<i>Panel B: Mothers and Fathers</i>												
	Mothers of School-Age Children						Fathers of School-Age Children					
	Early			Late			Early			Late		
	N	Obs	(%) or Mean	N	Obs	(%) or Mean	N	Obs	(%) or Mean	N	Obs	(%) or Mean
Age	20,253	57,733	47.9 [13.35]	33,672	94,870	47.7 [13.59]	15,693	44,896	48.9 [12.20]	25,446	72,048	48.7 [12.21]
Female	20,253	57,733	100.0 [0.00]	33,672	94,870	100.0 [0.00]	15,693	44,896	0.0 [0.00]	25,446	72,048	0.0 [0.00]
Living with at least One Other Adult	20,253	57,733	47.8 [49.95]	33,672	94,870	47.0 [49.91]	15,693	44,896	52.3 [49.95]	25,446	72,048	52.4 [49.94]
Has at least One Own School-Age Child	20,253	57,733	100.0 [0.00]	33,672	94,870	100.0 [0.00]	15,693	44,896	100.0 [0.00]	25,446	72,048	100.0 [0.00]
Educational Attainment												
Less than High School	20,253	57,733	11.7 [32.14]	33,672	94,870	9.9 [29.85]	15,693	44,896	11.8 [32.21]	25,446	72,048	10.1 [30.18]
High School Diploma or Equivalent	20,253	57,733	42.0 [49.36]	33,672	94,870	42.1 [49.38]	15,693	44,896	42.6 [49.45]	25,446	72,048	43.9 [49.62]
Associates Degree	20,253	57,733	11.8 [32.21]	33,672	94,870	12.2 [32.77]	15,693	44,896	9.8 [29.73]	25,446	72,048	10.7 [30.95]
Bachelor Degree or Higher	20,253	57,733	34.5 [47.54]	33,672	94,870	35.7 [47.93]	15,693	44,896	35.8 [47.95]	25,446	72,048	35.3 [47.78]
Employment Status												
Not in Labor Force	20,253	57,733	34.6 [47.57]	33,672	94,870	33.5 [47.20]	15,693	44,896	16.4 [37.03]	25,446	72,048	15.9 [36.53]
Unemployed	13,978	37,756	5.0 [21.81]	23,663	63,079	4.4 [20.46]	13,344	37,534	3.9 [19.35]	21,885	60,619	3.5 [18.49]
Employed, Not Working Prior Week	13,412	35,865	3.9 [19.39]	22,799	60,319	3.8 [19.01]	12,975	36,072	2.9 [16.90]	21,313	58,470	2.9 [16.71]
Of Those Working...												
Hours Worked Last Week	13,131	34,461	36.6 [12.11]	22,366	58,053	37.0 [11.82]	12,814	35,010	42.8 [11.81]	21,032	56,789	43.1 [12.14]
Earnings Last Week	7,001	8,422	\$949.89 [672.50]	12,005	14,305	\$911.75 [621.23]	6,631	8,030	\$1,380.38 [779.20]	10,724	12,941	\$1,333.23 [765.96]
Hourly Wage	4,246	4,871	\$18.97 [11.22]	7,031	7,996	\$18.44 [10.52]	3,406	3,884	\$23.49 [12.10]	5,315	6,060	\$22.80 [11.98]

Source: Author calculations using IPUMS-CPS, University of Minnesota, ipums.org.

TABLE 2—IMMEDIATE IMPACT ON NOT BEING IN THE LABOR FORCE (DETACHMENT)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
2020	1.6765*** (0.0599)	2.3286*** (0.1742)	2.4471*** (0.2188)	2.2393*** (0.2189)	3.2461*** (0.8049)	2.5013*** (0.6144)	2.2426*** (0.2386)	2.5938*** (0.6326)
Early*2020	0.8694*** (0.0460)	0.8525 (0.0964)	0.8878 (0.1337)	0.8070 (0.1412)	0.9886 (0.3614)	1.5971 (0.8199)	0.8041 (0.1371)	1.4096 (0.6057)
2020*Female							1.0758 (0.1575)	1.2573 (0.4097)
Early*2020*Female							1.1073 (0.2750)	0.6672 (0.3730)
Controls	No	Yes						
Observations	94,949	94,949	52,315	42,634	15,620	7,334	94,949	22,954
Number of individuals	23,408	23,408	12,832	10,576	3,862	1,812	23,408	5,674

Notes: Models (1), (2), and (7) use an analytical sample of the total working-age population (15+). Models (3) and (4) use a sample of working-age population (15+) women (3) and men (4), respectively. Models (5), (6), and (8) are constructed using an analytical sample of adults with at least one own child living with them in the household. Model (5) is mothers only. Model (6) is fathers only. Controls include month, the presence of at least one other working age adult in the household, education level, and industry. All models include individual-level fixed effects and bootstrapped standard errors.

Source: Author calculations using IPUMS-CPS, University of Minnesota, ipums.org.

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level.

TABLE 3—IMMEDIATE IMPACT ON UNEMPLOYMENT

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
2020	3.4264*** (0.1866)	3.8147*** (0.2009)	4.4218*** (0.3799)	3.3685*** (0.2933)	4.9542*** (0.5769)	4.1681*** (0.6834)	3.4374*** (0.2243)	4.2875*** (0.5292)
Early*2020	1.0428 (0.0811)	1.0375 (0.0926)	1.0609 (0.1309)	1.0181 (0.1343)	1.0620 (0.2226)	0.8195 (0.1911)	1.0168 (0.1163)	0.8117 (0.1742)
2020*Female							1.2465** (0.1185)	1.1054 (0.1782)
Early*2020*Female							1.0465 (0.1776)	1.3287 (0.3652)
Controls	No	Yes						
Observations	45,608	45,608	22,417	23,191	7,918	6,115	45,608	14,033
Number of individuals	11,592	11,592	5,669	5,923	1,971	1,535	11,592	3,506

Notes: Models (1), (2), and (7) use an analytical sample of the total working-age population (15+) in the labor force. Models (3) and (4) use a sample of working-age population (15+) women (3) and men (4), respectively, in the labor force. Models (5), (6), and (8) are constructed using an analytical sample of working-age adults in the labor force with at least one own child living with them in the household. Model (5) is mothers only. Model (6) is fathers only. Controls include month, the presence of at least one other working age adult in the household, education level, and industry. All models include individual-level fixed effects and bootstrapped standard errors.

Source: Author calculations using IPUMS-CPS, University of Minnesota, ipums.org.

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level.

TABLE 4—IMMEDIATE IMPACT ON NOT WORKING THE PRIOR WEEK

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
2020	1.6784*** (0.0561)	1.6787*** (0.0779)	1.7566*** (0.0954)	1.5969*** (0.0963)	1.7587*** (0.1519)	1.7243*** (0.1858)	1.6061*** (0.0825)	1.7404*** (0.1745)
Early*2020	1.1998*** (0.0748)	1.2023*** (0.0698)	1.3189*** (0.1283)	1.0917 (0.0874)	1.5322** (0.2659)	1.1484 (0.2038)	1.0928 (0.1092)	1.1520 (0.2053)
2020*Female							1.0872 (0.0759)	0.9954 (0.1433)
Early*2020*Female							1.2038 (0.1625)	1.3436 (0.3075)
Controls	No	Yes						
Observations	48,651	48,651	25,621	23,030	9,190	7,401	48,651	16,591
Number of individuals	12,352	12,352	6,520	5,832	2,323	1,840	12,352	4,163

Notes: Models (1), (2), and (7) use an analytical sample of the total working-age population (15+). Models (3) and (4) use a sample of working-age population (15+) women (3) and men (4), respectively. Models (5), (6), and (8) are constructed using an analytical sample of adults with at least one own child living with them in the household. Model (5) is mothers only. Model (6) is fathers only. Controls include month, the presence of at least one other working age adult in the household, education level, and industry. All models include individual-level fixed effects and bootstrapped standard errors.

Source: Author calculations using IPUMS-CPS, University of Minnesota, ipums.org.

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level.

TABLE 5—IMMEDIATE IMPACT ON HOURS WORKED THE PREVIOUS WEEK

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
2020	0.9744*** (0.0015)	0.9740*** (0.0015)	0.9769*** (0.0023)	0.9716*** (0.0020)	0.9775*** (0.0036)	0.9716*** (0.0032)	0.9715*** (0.0020)	0.9714*** (0.0032)
Early*2020	1.0010 (0.0025)	1.0010 (0.0025)	1.0099*** (0.0037)	0.9940* (0.0033)	1.0101* (0.0057)	0.9862*** (0.0051)	0.9940* (0.0033)	0.9863*** (0.0051)
2020*Female							1.0058* (0.0031)	1.0064 (0.0049)
Early*2020*Female							1.0159*** (0.0050)	1.0241*** (0.0078)
Controls	No	Yes						
Observations	438,700	438,700	208,408	230,292	81,709	82,293	438,700	164,002
Number of individuals	132,335	132,335	63,237	69,098	24,692	24,340	132,335	49,032

Notes: Models (1), (2), and (7) use an analytical sample of the total working-age population (15+). Models (3) and (4) use a sample of working-age population (15+) women (3) and men (4), respectively. Models (5), (6), and (8) are constructed using an analytical sample of adults with at least one own child living with them in the household. Model (5) is mothers only. Model (6) is fathers only. Controls include month, the presence of at least one other working age adult in the household, education level, and industry. All models include individual-level fixed effects and robust standard errors.

Source: Author calculations using IPUMS-CPS, University of Minnesota, ipums.org.

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level.

TABLE 6—IMMEDIATE IMPACT ON LOG WEEKLY EARNINGS (FOR THOSE WITH A JOB)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
2020	1.0451*** (0.0071)	1.0423*** (0.0071)	1.0465*** (0.0099)	1.0385*** (0.0102)	1.0369*** (0.0144)	1.0182 (0.0167)	1.0382*** (0.0102)	1.0189 (0.0167)
Early*2020	1.0105 (0.0096)	1.0100 (0.0096)	1.0199 (0.0139)	1.0011 (0.0133)	1.0196 (0.0212)	0.9948 (0.0213)	1.0009 (0.0132)	0.9944 (0.0213)
2020*Female							1.0082 (0.0137)	1.0171 (0.0219)
Early*2020*Female							1.0189 (0.0194)	1.0257 (0.0305)
Constant	762.6105*** (1.7717)	627.5243*** (24.5453)	530.9059*** (36.5680)	744.2200*** (35.9656)	692.8281*** (74.7624)	933.8309*** (72.6328)	627.3170*** (24.5376)	764.0147*** (45.3414)
Controls	No	Yes						
Observations	119,185	119,185	58,661	60,524	22,727	20,971	119,185	43,698
Number of individuals	99,749	99,749	49,142	50,607	19,006	17,355	99,749	36,361

Notes: Models (1), (2), and (7) use an analytical sample of the total working-age population (15+). Models (3) and (4) use a sample of working-age population (15+) women (3) and men (4), respectively. Models (5), (6), and (8) are constructed using an analytical sample of adults with at least one own child living with them in the household. Model (5) is mothers only. Model (6) is fathers only. Controls include month, the presence of at least one other working age adult in the household, education level, and industry. All models include individual-level fixed effects and robust standard errors.

Source: Author calculations using IPUMS-CPS, University of Minnesota, ipums.org.

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level.

TABLE 7—IMMEDIATE IMPACT ON LOG HOURLY WAGES (FOR THOSE WITH A JOB)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
2020	1.0552*** (0.0060)	1.0527*** (0.0060)	1.0489*** (0.0084)	1.0573*** (0.0085)	1.0427*** (0.0141)	1.0596*** (0.0163)	1.0580*** (0.0085)	1.0602*** (0.0165)
Early*2020	1.0034 (0.0088)	1.0030 (0.0088)	0.9999 (0.0120)	1.0070 (0.0128)	0.9921 (0.0193)	0.9769 (0.0235)	1.0064 (0.0128)	0.9778 (0.0236)
2020*Female							0.9904 (0.0112)	0.9830 (0.0202)
Early*2020*Female							0.9933 (0.0173)	1.0126 (0.0312)
Constant	16.3691*** (0.0329)	15.2018*** (0.4678)	13.9792*** (0.6739)	15.8762*** (0.6310)	15.9728*** (1.0363)	16.3373*** (1.5418)	15.2098*** (0.4680)	16.0748*** (1.0090)
Controls	No	Yes						
Observations	67,285	67,285	34,562	32,723	12,867	9,944	67,285	22,811
Number of individuals	58,928	58,928	30,246	28,682	11,277	8,721	58,928	19,998

Notes: Models (1), (2), and (7) use an analytical sample of the total working-age population (15+). Models (3) and (4) use a sample of working-age population (15+) women (3) and men (4), respectively. Models (5), (6), and (8) are constructed using an analytical sample of adults with at least one own child living with them in the household. Model (5) is mothers only. Model (6) is fathers only. Controls include month, the presence of at least one other working age adult in the household, education level, and industry. All models include individual-level fixed effects and robust standard errors.

Source: Author calculations using IPUMS-CPS, University of Minnesota, ipums.org.

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level.

TABLE 8—ROBUSTNESS CHECK: IMPACT ON NOT WORKING USING ONLY MONTHS PRIOR TO SHUTDOWN

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
2020	0.9302 (0.0557)	0.9319 (0.0680)	0.9961 (0.1121)	0.8611* (0.0756)	0.8899 (0.1285)	0.7577 (0.1547)	0.8651 (0.0833)	0.8020 (0.1241)
Early*2020	0.9215 (0.0987)	0.9235 (0.0921)	0.9510 (0.1570)	0.8994 (0.1443)	0.9533 (0.2519)	0.9795 (0.2712)	0.9027 (0.1403)	0.9556 (0.2093)
2020*Female							1.1585 (0.1512)	1.1302 (0.2368)
Early*2020*Female							1.0530 (0.2263)	0.9997 (0.3490)
Controls	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	9,665	9,665	4,893	4,772	1,609	1,496	9,665	3,105
Number of individuals	3,715	3,715	1,887	1,828	631	569	3,715	1,200

Notes: Models (1), (2), and (7) use an analytical sample of the total working-age population (15+). Models (3) and (4) use a sample of working-age population (15+) women (3) and men (4), respectively. Models (5), (6), and (8) are constructed using an analytical sample of adults with at least one own child living with them in the household. Model (5) is mothers only. Model (6) is fathers only. Controls include month, the presence of at least one other working age adult in the household, education level, and industry. All models include individual-level fixed effects, bootstrapped standard errors, and only the months of January and February.

Source: Author calculations using IPUMS-CPS, University of Minnesota, ipums.org.

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level.

APPENDIX TABLE 1—STATES BY CLOSURE STATUS

Early Closure (N=18)	Late/No Closure (N=33)
California	Alabama
Colorado	Alaska
Delaware	Arizona
District of Columbia	Arkansas
Indiana	Connecticut
Kentucky	Florida
Louisiana	Georgia
Michigan	Hawaii
Ohio	Idaho
Oregon	Illinois
Pennsylvania	Iowa
Rhode Island	Kansas
South Dakota	Maine
Utah	Maryland
Virginia	Massachusetts
Washington	Minnesota
West Virginia	Mississippi
Wisconsin	Missouri
	Montana
	Nebraska
	Nevada
	New Hampshire
	New Jersey
	New Mexico
	New York
	North Carolina
	North Dakota
	Oklahoma
	South Carolina
	Tennessee
	Texas
	Vermont
	Wyoming

APPENDIX TABLE 2—ROBUSTNESS CHECK IMPACT ON NOT WORKING THE PRIOR WEEK FOR A SUBSET OF THE SAMPLE

	(1)	(2)	(3)	(4)	(5)
2020	1.5680*** (0.1262)	1.6447*** (0.1745)	1.6518*** (0.1639)	1.7909*** (0.1313)	1.3098* (0.2030)
Early*2020	1.3219** (0.1781)	1.0533 (0.1699)	1.0620 (0.1580)	1.1970 (0.1444)	1.2442 (0.2731)
2020*Female			0.9387 (0.1192)		
Early*2020*Female			1.2538 (0.3192)		
Observations	11,209	8,632	19,841	15,904	4,435
Number of individuals	2,842	2,152	4,994	4,152	1,170

Notes: Model (1) includes all women with children under age 18. Model (2) is all men with children under age 18. Model (3) uses female as an interaction term to compare mothers and fathers of all children under age 18. Model (4) includes all women with no own school age children in the household (but can have children under age 5). Model (5) is women age 25 to 39 with no own school age children in the household (but can have children under age 5). Controls include month, at least one other working age adult in the household, education level, and industry. All models include individual-level fixed effects and bootstrapped standard errors.

Source: Author calculations using IPUMS-CPS, University of Minnesota, ipums.org.

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level.

APPENDIX TABLE 3—ROBUSTNESS CHECK IMPACT ON HOURS WORKED FOR A SUBSET OF THE SAMPLE

	(1)	(2)	(3)
2020	0.9596*** (0.0136)	0.9827*** (0.0044)	0.9681*** (0.0074)
Early*2020	1.0494** (0.0227)	1.0028 (0.0069)	1.0181 (0.0119)
Observations	6,217	52,627	21,438
Number of individuals	2,051	15,956	6,705

Notes: Model (1) includes mothers with school age children and a spouse who was not working. Model (2) is mothers with school age children and a spouse who was working. Model (3) includes mothers with school age children and no spouse. Controls include month, at least one other working age adult in the household, education level, and industry. All models include individual-level fixed effects and robust standard errors.

Source: Author calculations using IPUMS-CPS, University of Minnesota, ipums.org.

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level.