# Women's Labor Force Exits during COVID-19: Differences by Motherhood, Race, and Ethnicity

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**Abstract**

Increases in labor force exits during the COVID-19 pandemic were larger for Black women, Latinas, and women living with children. After controlling for detailed job and demographic characteristics, we estimate larger increases in labor force exits among women living with children under age 6 and among lower-earning women living with school-age children. Women of color also had larger increases in labor force exits during the pandemic. A decomposition shows that differences in education and job characteristics explain a large portion of the racial differences in exits. The presence of children also predicted larger increases in exits during the pandemic among Latina and Black women. Overall, results suggest that childcare interruptions led to excess pandemic labor force exits with larger effects for women of color.

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The COVID-19 pandemic led to unprecedented employment declines as major economic activities were curtailed in the name of public health. While some aspects of the pandemic recession have followed previous recessions, with larger employment losses among less-educated workers and workers of color (Cortes and Forsythe (Forthcoming); Couch, Fairlie and Xu (2020)), others have been atypical. In particular, this recession affected U.S. women's aggregate employment more than men's (Albanesi and Kim (2021)), and among women there was great variation in pandemic labor market experiences for different groups.

In this paper, we examine differences among U.S. women in their labor force participation in the fall and winter of 2020-2021 across two distinct dimensions. First, we explore differences by race and ethnicity, highlighting larger declines in labor force participation rates and higher rates of labor force exits among women of color. Second, we study the experiences of women living with children to understand if the unique demands of raising children during the pandemic, led to additional labor force participation declines and exits. We find that women living with children had larger declines in labor force participation and were more likely to leave the labor force relative to non-mothers. Our analysis then links these two findings by decomposing the differences in exits across racial groups. We find that that while differences in education and job characteristics were important contributors to increased exits among women of color, the presence of children also contributed to the gap in exits between women of color and White women.

We find that disparities in longer term labor force exits among women of color reflected disparities early in the pandemic, including steeper initial employment declines among workers of color (Canilang et al. (2020), Cortes and Forsythe (Forthcoming), and Couch, Fairlie and Xu (2020)). Black women and Latinas had sharp and persistent declines in labor force participation that were driven by labor force exits. Women of color's labor force participation decreased by 2 percentage points more than White women's and participation gaps were even greater among those previously employed. The racial differences in participation changes remained relatively stable over the six months from September 2020 to March 2021.

Next, we show that women living with children had larger and more persistent labor force participation rate declines. The fall in labor force participation rates were

especially large among those who were employed one-year before. When we model these labor force exits to control for the role of education, earnings, and COVID-19 occupation and industry measures, we find that women living with children under age 6 were more likely to exit the labor force during the pandemic than women without children. Women living with children aged 6 to 12 who were working low-wage jobs were also more likely to exit the labor force. When we focus on excess exits relative to previous years, we find that a single woman, earning an average wage, living with a child aged 0 to 5 was 5 percentage points more likely to exit the labor force relative to a similar woman with no children at home. Among women with primary-school-aged children in the household, the excess pandemic-era labor force exits were concentrated among lower-earning women.

The findings show which women with children have seen labor force participation changes by focusing on exits, separating the effects by children's ages, and allowing for different effects by previous earnings and marital status. They complement earlier studies of the impacts of school and child care closures that compare men and women with and without children (Heggeness (2020), Russell and Sun (2020), Albanesi and Kim (2021),and Luengo-Prado (2021)). Our added distinctions on which women left the labor force also build on previous work studying women's pandemic labor market experiences (Leigh, Montes and Smith (2021), Pitts (2021), and Couch, Fairlie and Xu (Forthcoming)). Finally, they provide context for designing targeted policies to encourage reemployment.

These results partially validate the widespread belief that childcare accessibility and reliability restricted women's labor force participation during the pandemic. The findings are also consistent with previous work suggesting that the cost and reliability of childcare as well as the access to informal care can influence mothers' labor force participation (Compton and Pollak (2014), Bick (2016), Morrissey (2017), Krolikowski, Zabek and Coate (2020)). The labor force exits we identify in the paper are likely to have lasting negative effects on women's future earnings as workforce interruptions, which are more common for women, still contribute to the gender earnings gap (Blau and Kahn (2017)). The women who experienced the largest increases in exits were single women with small children and lower-income women with school-aged children, two groups for whom current and future earn-

ings losses may be especially detrimental for them and their families.

Finally, our work links the disparate labor force patterns by race with the patterns by household structure by decomposing the gap in labor force exits between women of color and White women. We find that education and job characteristics explain a large portion of the racial differences in exits and that they predicted larger gaps during the pandemic. The effect of living with children was also an important explanatory factor during the pandemic, but not before it. In particular, the differential effects of children by marital status and previous earnings meaningfully contribute to the larger predicted effect of children on pandemic labor force exits for women of color.

The focus of our paper is to examine differences in labor force participation patterns among women by race, ethnicity, and the presence of children because the differences between groups of women are larger than those between men and women overall or between different groups of men. Although men of color were more likely to leave the labor force in the early months of the pandemic, that difference moderated in the fall of 2020 such that labor force participation declines were similar for men of color and White men in March 2021. Men living with children looked similar to men with no children at home in terms of labor force participation rates throughout the pandemic. Our analysis complements the existing work that has focused on the differences between men and women during the pandemic and is consistent with the finding that women's employment was more affected by childcare responsibilities earlier in the pandemic ((Couch, Fairlie and Xu, Forthcoming)).

The results are important for policymakers to understand and address disparities in the labor market that arose during the COVID-19 pandemic. The later stages of the post–Great Recession recovery saw disproportionate increases in the participation of workers of color as wages and labor demand rose. As of December 2021, labor force participation rates among Black Americans were 2.4 percentage points lower than in February 2020, and Latinx labor force participation was 2.0 percentage points lower. Similarly, labor force participation rates for mothers of children of all ages generally rose between 2015 and 2019 during a strong labor

market.[1] Among women with children under age 18, labor force participation rate fell in 2020 to 71.2 percent from 72.3 percent in 2019 (Bureau of Labor Statistics (2021)). Differences by race and ethnicity have also taken on an increased importance in many eyes because of the disproportionate effects of COVID-19 on Latinx and Black Americans. The pandemic has also provided momentum for rethinking caregiving and its impacts on the economy. Understanding the drivers of differential labor force exits during the COVID-19 recession is an important step in addressing broader disparities during the economic recovery.

# I Data

In this paper, we study the labor force participation of women during the first year of the COVID-19 pandemic, with a focus on outcomes from September 2020 to February 2021. Our analyses use monthly data from the Current Population Survey (CPS) from the U.S. Census Bureau accessed from IPUMS (Flood et al. (2020)).[2]

Our sample includes prime-working age women aged 25 to 54 classified by their labor force status. We use information on employment and labor force status to categorize respondents as employed, unemployed, or not of the labor force. In our regression analyses of labor force exits, we separately identify those who are not in the labor force but respond that caregiving is the reason they are out of the labor force and those who are not in the labor force but express some interest in working. Specifically, we use responses to two CPS questions about whether individuals plan to search for work in the next 12 months or say they want or would accept employment to classify respondents as having an interest in working.

We characterize respondents' race and ethnicity by calling them Latinx if they say they are of Hispanic, Latino, or Spanish origin. Among those who answer that they are not Latinx, we characterize them according to their (single) reported race as Black, White, or other. We focus on Black, White and Latinx respondents in this paper because the other racial groups have sample sizes too small to separately

[1] For data from the U.S. Department of Labor tableau visualization, see https://www.dol.gov/agencies/wb/data/mothers-and-families.

[2] The Current Population Survey currently contains only information about sex, not gender. So we use sex as an imperfect proxy for gender.

analyze.

We use information on the ages of other individuals in the household independent from familial relationships to create indicators for the presence of children of different ages. This measure has the benefit of including caregiving responsibilities for children in the household even if they are not one's own children, although it may differ from other analyses that focus only on respondents' children.

The majority of our analysis uses a sample of individuals who were employed before the pandemic using CPS annual linkages. We use an exact 12 month lag to determine employment status with no job tenure requirement. For many analyses this is equivalent to linking the respondents' surveys when they are in the outgoing rotation group. The linking does reduce the sample size substantially, decreasing the precision of the estimates conditional on previous employment status. Focusing on previously employed women allows us to measure the job characteristics of these employed individuals prior to the pandemic. Because we focus on individuals who are employed before the pandemic, we only include observations through February of 2021 where the pre-pandemic observation is from February 2020. All results using linked observations are weighted using longitudinal weights provided by IPUMS.

We also consider industry- and occupation-level impacts of COVID-19 as measured by special questions added to the CPS about COVID-19 in the summer of 2020. Specifically, we construct industry- and occupation-level indices of the percentage change in industry employment from one year earlier, the share of workers who are working from home, and the share of workers who responded that they had lost work in the past four weeks because of the pandemic (regardless of whether they were paid). To remove a mechanical correlation in our measures as they are applied to women's labor force exits, we consider the pandemic labor market experiences of men to construct our measures. We also increase our sample size in sometimes small (four digit) industries and occupations by using observations across the entire summer, from May to August 2020.[3]

[3]Our exercise is meant to be descriptive. However, these impacts are quite plausibly exogenous in that it is unlikely that the differences are due to the selection of women into occupations and industries for other reasons.

# II Declines in Labor Force Participation

As we show in panel A of figure 1, Black women and Latinas saw higher percentage point declines in labor force participation relative to White women.[4] The initial decline in labor force participation among these groups was more than 4 percentage points, while White women experienced a decline of around 2 percentage points. In the fall and winter of 2020, Black women saw an increase in their labor force participation although this has reversed in recent months. Participation declines among Latinas have remained larger than for White women although the gap has narrowed in the second half of 2021. The labor force declines mirror what previous studies have shown for employment patterns. In the early months of the pandemic, employment losses were larger for women relative to men (Albanesi and Kim (2021)) and for workers of color (Couch, Fairlie and Xu (2020), Cortes and Forsythe (Forthcoming)). While men of color also experienced large declines in both employment and labor force participation, labor force participation changes among men of different races and ethnicities were much more similar, particularly after fall of 2020.

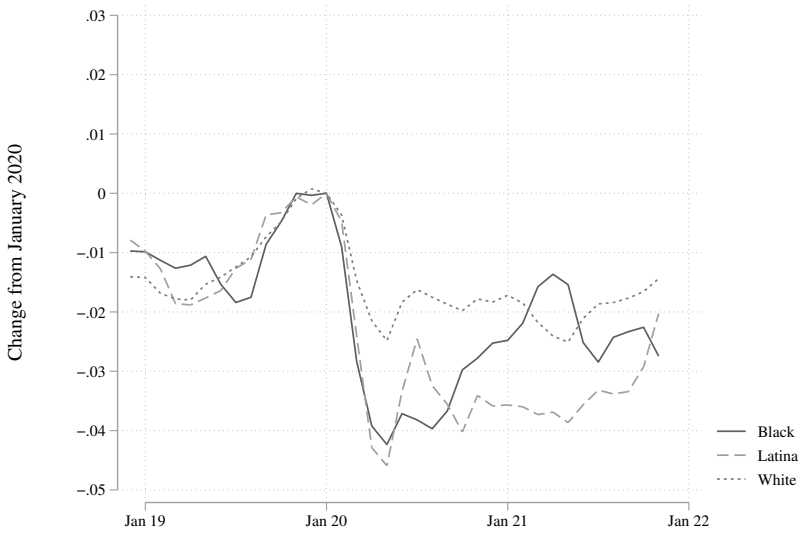
Both the public and researchers have placed a lot of attention on the role of caring for children in explaining higher employment losses and declines in labor force participation among women (Furman, Kearney and Powell III (2021), Albanesi and Kim (2021)). As we show in panel A of figure 2, women in households with young and school-age children saw larger and more sustained participation declines than women without children under age 13 in their household. In June of 2021, labor force participation rates among women in households with children aged 6 to 12 were 3 percentage points lower than in January 2020, while women in households with children aged 0 to 5 saw a 2 percentage point decline. These gaps have narrowed in the second half of 2021 especially for women living with young children. The plot also demonstrates the wide temporal variation in participation that existed even before the pandemic, particularly for women with young children.

Next, we match CPS respondents to their interviews from one year before to examine how pandemic labor force participation differed between women who were

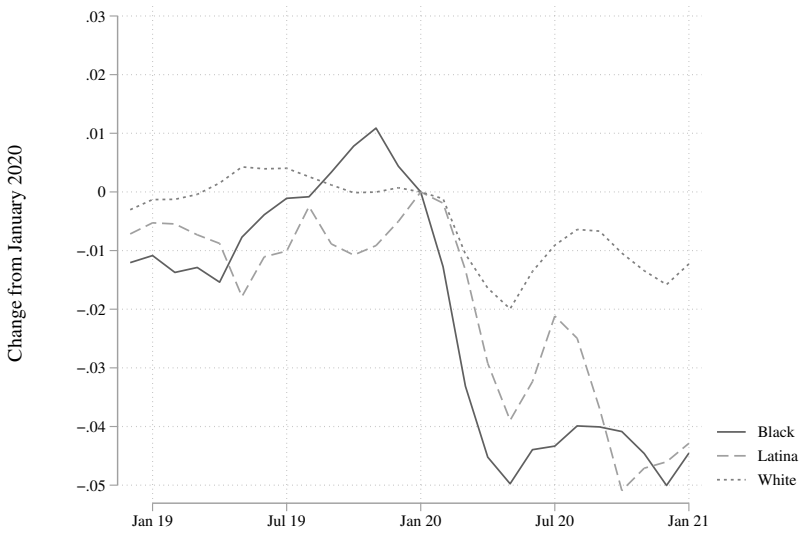
[4] We use seasonally-adjusted three month average values computed from January 2003 to February 2020 to adjust for monthly seasonality in our outcome variables. All outputs are weighted using sampling weights.

Figure 1: Women's Labor Force Participation Changes, by Race and Ethnicity

Panel A: All



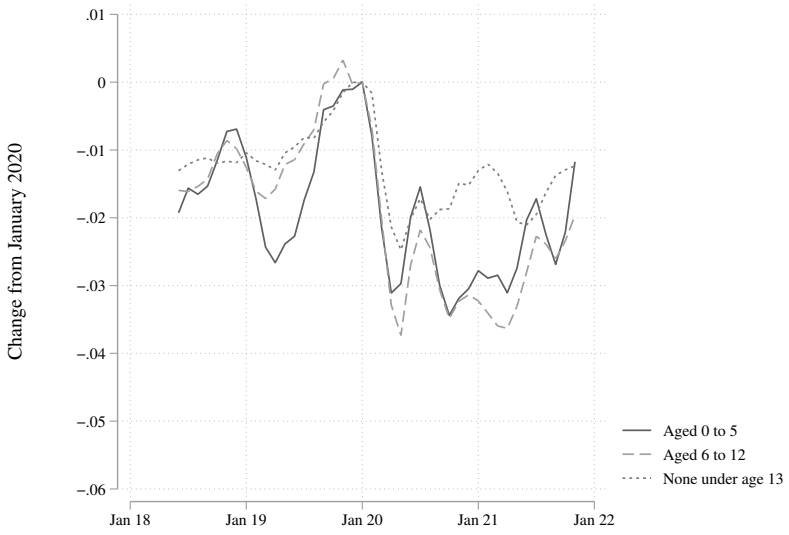

Panel B: Previously Employed



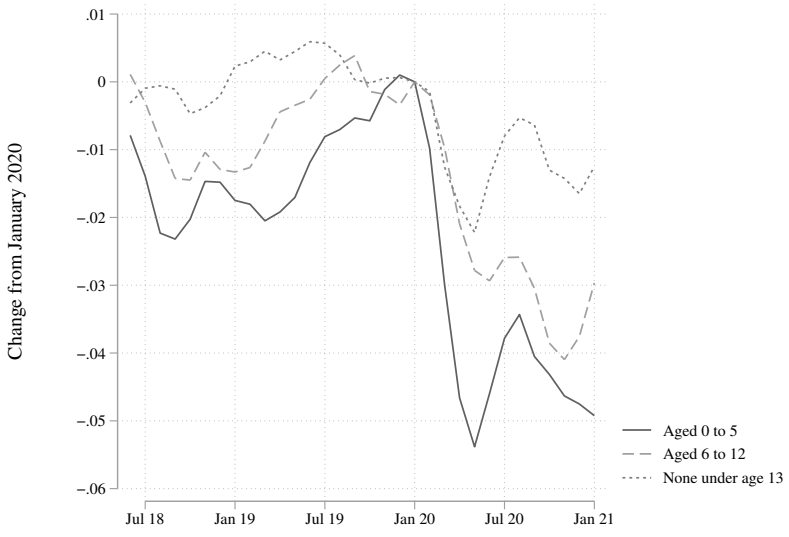

Note: Plotted are three-month moving average labor force participation rates for prime-working-age women, by race and ethnicity. Each is adjusted for monthly seasonality based on average monthly values from January 2003 to February 2020. Statistics are weighted using sampling weights. Data are from the Current Population Survey downloaded from IPUMS Flood et al. (2020).

Figure 2: Women's Labor Force Participation Changes, by Presence of Children

Panel A: All




Panel B: Previously Employed




Note: Plotted are three-month moving average labor force participation rates for prime-working-age women by the presence of children aged 0 to 5 and 6 to 12 before the pandemic. Each is adjusted for monthly seasonality based on average monthly values from January 2003 to February 2020. Statistics are weighted using sampling weights. Data are from the Current Population Survey downloaded from IPUMS Flood et al. (2020).

previously employed prior to the pandemic and those who were not. Separating the sample by previous employment allows us to distinguish between changes in exits and entries that contribute to patterns of declining women's labor force participation.Because we plot three-month averages, we only use matched respondents through January 2021 to avoid conditioning on pandemic-era employment, which we categorize as any observation in March 2020 or later.

We find that the decline in women's labor force participation is driven primarily by previously employed women exiting the labor force (panel B of figures 1 and 2). The patterns by race and ethnicity suggest that employment losses translated into labor force exits for women in general and Black women and Latinas in particular. Differences in entries (not shown) are more difficult to interpret because of the small sample size underlying the estimates, though some evidence indicates declines in labor force entry during the pandemic, particularly among Black women.[5]

To more directly compare the role of exits and entries in the declining labor force participation rates of women by race and ethnicity, we predict counterfactual pandemic era exit and entry rates using the previous years' transition rates. The rates are predicted for April 2020 to January 2021 using rates from April to January 2015 to 2020. We compare these counterfactual rates with the actual exit and entry rates conditional on previous employment to generate an estimated labor force decline.[6] Consistent with the trends plotted in figure 1, we see larger declines, relative to the counterfactual, for Black women and Latinas relative to White women, and, based on this calculation, the share of the decline attributed to increased exits is 88 percent for Black women, 50 percent for Latinas, and 70 percent for White women. For the remainder of the paper, we will focus only on the previously employed. While decreasing entry may have a role in explaining different pandemic labor market ex-

[5]The share of nonemployed women is between 20 and 30 percent of the total sample so estimates that require matched samples conditional on previous nonemployment are subject to more sampling error than overall estimates or those conditional on previous employment. In regressions not reported, pandemic-era changes in labor force participation among women previously not employed are not statistically different from pre-pandemic changes.

[6]The counterfactual exit rate during the pandemic for race or ethnicity group $j$ is calculated as $\Pr(\text{LFP}_{j,2019}|\text{emp}_{j,2018})$. The excess exits are calculated as $[\Pr(\text{LFP}_{j,2020}|\text{emp}_{j,2019}) - \Pr(\text{LFP}_{j,2019}|\text{emp}_{j,2018})] * \text{emp}_{j,2019}$. The decline in entry is similarly calculated as $[\Pr(\text{LFP}_{j,2020}|\text{notemp}_{j,2019}) - Pr(\text{LFP}_{j,2019}|\text{notemp}_{j,2018})] * \text{notemp}_{j,2019}$.

periences by race and ethnicity, we leave it to future researchers with larger data sets to further explore patterns in labor market entry.

Next, we examine differential labor force exits by presence of children in the home. In panel B of figure 2, we show that women with young children saw the sharpest declines in labor force participation, followed by women living with school-age children. Women in households with no children under age 13 who were previously employed have labor force participation rates that are only around 1 percentage point lower than before the pandemic.

For the remainder of the paper, we focus on describing labor force exits for a few reasons. First, the overall labor force participation patterns we identify using the cross-sectional sample appear to be driven by those who were previously employed. Second, this population represents individuals who policymakers are likely to focus on in promoting their return to work. If individuals were working before the pandemic, then they are more likely to be willing and able to return to the labor force than the average individual who is out of the labor force. Finally, job characteristics before the pandemic are available only for people who were employed before the pandemic, and we want to both control for worker characteristics and understand how the pandemic affected their labor force participation.

# III Explaining Women's Labor Force Exits

Next, we use three approaches to analyze differences in women's labor force exits by race, ethnicity, and household composition. First, we examine predictors of overall pandemic-era exits, exits attributed to caregiving, and exits where the woman expresses interest in returning to work during the next year. Second, we compare labor force exits during the pandemic to those in the period immediately preceding it. This comparison allows us to understand the factors that were new drivers of labor force exits or especially important drivers of exits during the pandemic. Finally, we use a modified, non-linear Oaxaca decomposition technique (Fairlie, 2005) to show the extent that covariates – like motherhood, wages, and occupational sorting – can explain Latinas and Black women's higher rates of labor force exits prior to and during the pandemic.

**Empirical Methodology**

Our initial analysis of pandemic exits, uses linear probability models to predict the likelihood that a woman who was previously employed will have exited in the 12 months ending between September 2020 and February 2021. The period coincides with the beginning of the typical 2020-21 school year and the conclusion of the first six months of the pandemic. It is the latest we can measure labor market exits during the pandemic using the CPS. As with all results, we use a sample of prime-working-age (aged 25 to 54) women.[7]

We first estimate equation 1, which examines predictors of all exits during the sample period. The $\beta_0$ coefficients show the impact of variables, or an interaction of variables, on the probability that a woman exits the labor force during the sample period conditional on having been working one year before. We estimate this specification for two different time periods for comparison: pandemic observations and pre-pandemic observations. Specifically, we use a sample of women whose last observation is from February 2015 to 2020 as our reference group for before the pandemic and data for women whose last observation is September 2020 and February 2021 for our sample during the pandemic.

Next, we augment our analysis by estimating labor force exits in excess of historical trends. We estimate equation 2, which allows us to highlight characteristics that were predictive of higher labor market exits during the pandemic relative to the years before. This analysis includes women previously employed one-year prior both during the pandemic and the years prior to the pandemic. Our coefficient of interest, $\beta_2$ in equation 2, measures the additional impact of each variable on excess exits during the pandemic relative to their impact in the period before the pandemic, which is measured by $\beta_1$.

$$\text{Exit} = X\beta_0 + \varepsilon_1 \quad (1)$$

$$\text{Exit} = X\beta_1 + 1_{\text{pandemic}} X\beta_2 + \varepsilon_2 \quad (2)$$

[7] We measure exits using interviews separated by 12 months in the CPS, so our sample of exits during the pandemic involves data collected in CPS interviews up to 12 months before our sample period. For simplicity we refer to the date of last interview when discussing different samples.

Finally we use an Oaxaca-Blinder-Fairlie non-linear decomposition to quantify how much observed characteristics can explain Latinas and Black women's higher rates of labor force exit during the COVID-19 pandemic. The decomposition consists of two steps. First, we estimate a regression model relating labor force exits to relevant covariates including measures of household composition and information on previous employment. Second, we use the model's estimated parameters to evaluate the effects that differences in the covariates across racial groups have on the probability of exiting the labor force.[8]

The idea behind the decomposition is most easily shown in the classical Oaxaca-Blinder case. Here the model is simply a linear probability model predicting labor force exits for individuals ($i$): $\text{Exit}_i = X_i\beta + \varepsilon_i$.

$$\underbrace{\overline{\text{Exit}}_j - \overline{\text{Exit}}_{j'}}_{\text{Overall}} = \underbrace{(\bar{X}_j - \bar{X}_{j'})\hat{\beta}}_{\text{Explained}} + \underbrace{\bar{X}_j(\hat{\beta}_j - \hat{\beta}) + \bar{X}_{j'}(\hat{\beta} - \hat{\beta}_{j'})}_{\text{Unexplained}} \tag{3}$$

Equation 3 shows that the overall difference in labor force exits for women of race $j$ compared to women of race or ethnicity $j'$, $(\overline{\text{Exit}}_j - \overline{\text{Exit}}_{j'})$, can be divided into terms that are explained by the model and terms that remain unexplained. Hats denote estimated coefficients and bars denote average values. Also note that we follow Oaxaca and Ransom (1994) in using the coefficients from a pooled model with all women ($\hat{\beta}$), as opposed to only White women ($\hat{\beta}_{j'}$), for the explained result.

The explained portion estimates the difference that would result due to the observed average differences in covariates and the relationships in the data as estimated by the pooled regression. The unexplained portion includes effects that are due either to differences in relationships between covariates and outcomes for women of the specified race or ethnicity (e.g. motherhood leading to a larger number of labor force exits for women in group $j$) or differences in labor force exits that are unrelated to covariates (e.g. unobserved institutional factors).

We follow Fairlie (2005) in using a logit specification (denoted $F(X_i\beta)$) to constrain predicted probabilities to between zero and one. The specification leads to

[8]Fortin, Lemieux and Firpo (2011) provide an excellent overview of decomposition methods generally, including Oaxaca-Blinder decomposition, and Fairlie (2005) provides more details on our specific methodology. A recent example using this technique for a similar question is Couch, Fairlie and Xu (2020).

a modification of equation 3 to present the difference in average probabilities of a labor force exit due to differences in covariates in the model, as shown below.

$$\underbrace{\overline{\text{Exit}}_j - \overline{\text{Exit}}_{j'}}_{\text{Overall}} = \underbrace{\overline{F(X_{ij}\hat{\beta})} - \overline{F(X_{ij'}\hat{\beta})}}_{\text{Explained}} + \underbrace{\overline{F(X_{ij}\hat{\beta}_j)} - \overline{F(X_{ij}\hat{\beta})} + \overline{F(X_{ij'}\hat{\beta})} - \overline{F(X_{ij'}\hat{\beta}_{j'})}}_{\text{Unexplained}} \tag{4}$$

We present the differences in the average predicted probability of exit from changing the distribution of the covariates of interest from the values for the reference group $j'$ with our group of interest $j'$, while keeping the distributions of all other covariates fixed.[9] This allows us to decompose the observed differences in exits seen in the data into parts that are explained overall and by different observed covariates and a part that remains unexplained.

**Covariates and Summary Statistics**

Table 1 shows averages and standard deviations for our outcome variables and covariates collected in the CPS for our sample of previously employed women. To show how differences in covariates could contribute to varying levels of exits during the pandemic, table 1 presents statistics for all women (overall) and by racial or ethnic group.[10]

The first two rows of table 1 show that 8 percent of previously employed women left the labor force in 2020 and that 5 percent did so and named caregiving as a reason. Women attributed more than one-half of labor force exits to caregiving, highlighting the importance of childcare and schooling disruptions during the pandemic. Latinas had high rates of labor force exits overall and were especially likely

[9] Since the detailed decomposition into categories (though not the result in terms of overall explanatory power) is sensitive to the ordering variables are introduced into the model, we introduced variables in a random order and averaged the effects over 10,000 iterations for each specification. The same qualitative results hold regardless of order, but the magnitudes of individual categories vary slightly.

[10] With the exception of exits, age, and education, the values come from the interview before March 2020.

Table 1: Summary Statistics

| | Overall | Latina | Black | White |
|---|---|---|---|---|
| Labor force exits | 0.08 | 0.12 | 0.10 | 0.06 |
| Labor force exits attributed to caregiving | 0.05 | 0.09 | 0.05 | 0.04 |
| Exited but expressed interest in working | 0.03 | 0.05 | 0.04 | 0.02 |
| Less than high school | 0.04 | 0.15 | 0.05 | 0.02 |
| High school or GED | 0.20 | 0.29 | 0.25 | 0.16 |
| Some college | 0.26 | 0.25 | 0.29 | 0.26 |
| Bachelor's degree (only) | 0.30 | 0.21 | 0.24 | 0.34 |
| More than a bachelor's degree | 0.20 | 0.10 | 0.18 | 0.22 |
| Lived with a child aged 0 to 5 | 0.21 | 0.23 | 0.22 | 0.21 |
| Lived with a child aged 6 to 12 | 0.29 | 0.35 | 0.31 | 0.27 |
| Was married | 0.59 | 0.54 | 0.36 | 0.64 |
| Previous weekly wage | 988 | 778 | 879 | 1042 |
| | (659) | (536) | (592) | (668) |
| Occupation employment change | -0.20 | -0.24 | -0.23 | -0.19 |
| | (0.23) | (0.24) | (0.21) | (0.23) |
| Occupation share working from home | 0.35 | 0.27 | 0.30 | 0.38 |
| | (0.24) | (0.24) | (0.24) | (0.24) |
| Occupation share unable to work due to COVID-19 | 0.18 | 0.21 | 0.18 | 0.17 |
| | (0.13) | (0.14) | (0.14) | (0.13) |
| Industry employment change | -0.24 | -0.26 | -0.23 | -0.23 |
| | (0.14) | (0.15) | (0.14) | (0.13) |
| Industry share working from home | 0.34 | 0.29 | 0.32 | 0.36 |
| | (0.22) | (0.22) | (0.21) | (0.22) |
| Industry share unable to work due to COVID-19 | 0.18 | 0.20 | 0.18 | 0.18 |
| | (0.13) | (0.14) | (0.14) | (0.12) |
| Age | 39.96 | 39.29 | 39.74 | 40.28 |
| | (8.50) | (8.58) | (8.45) | (8.50) |

Note: This table presents the mean values and standard deviations (only for continuous variables) of covariates in each of our categories of race and ethnicity. The estimation sample is prime-working-age women from September 2020 to February 2021 in the Current Population Survey who were employed one year earlier, which is when the variables are measured (besides age, education, and exits).

to exit due to caregiving reasons with nearly 75 percent of exits attributed to childcare. Around 3 percent of women who were previously employed exited the labor force but expressed interest in working. Like exits overall, the percentages were higher for Latinas and Black women relative to White women.[11]

Latinas, in particular, also had covariates that predicted much more severe labor market impacts of COVID-19. Table 1 shows that Latinas were employed in occupations and industries that had larger employment declines, lower prevalences of remote working, and higher shares of workers who lost work as a result of the pandemic. Latinas have less education and lower earnings relative to both Black and White women and they were more likely to be living with children compared with other groups of women.

Black women also had covariates predicting more severe impacts, though to a smaller degree than for Latinas. Table 1 shows that the average predicted occupational job loss for a Black woman was 23 percent, compared with 24 percent for a Latina and 19 percent for a White woman. Black women were also less likely than White women to be in occupations and industries where working from home as a result of COVID-19 was common. Black women earn substantially less and have lower average levels of education compared with White women. Black women are also much less likely to be married, likely reflecting broader economic and social inequalities.

## Exits during the Pandemic

### Exits Overall

Our estimated model of all labor force exits during the pandemic shows that women with less education and those who earned less before the pandemic were much more likely to leave the labor force. The first rows in column 1 of table 2 show that a woman with less than a high school degree was 8 percentage points more likely to exit the labor force than a woman with some college education and that a woman with an advanced degree was 1.4 percentage points less likely to exit the labor

[11] See the Appendix for further discussion and figures showing changes in the share of women out of the labor force expressing an interest in working.

force. Women who earned less before the pandemic also were more likely to exit the labor force; a one standard deviation decline in wages increases the likelihood of leaving the labor force by 1 percentage point. The larger movements out of the labor force for women with less education and lower earnings match with the general trend that the COVID-19 pandemic disproportionately affected less-educated and lower-earning workers (Adams-Prassl et al. (2020); Bartik et al. (2020); Canilang et al. (2020); Cortes and Forsythe (Forthcoming)). They are also consistent with previous evidence suggesting that less educated and lower earning workers suffer greater and more sustained employment losses during recessions more generally (Aaronson et al. (2019); Cajner, Coglianese and Montes (2021)).

After controlling for education and wages, we find that occupation and industry measures of the impact of COVID-19 play only a minor role in predicting labor force exits. This suggests that occupation- or industry-specific human capital and adjustment frictions explain little of the increase in women's labor force exits, at least for women with similar educational attainments and previous wages. The coefficients approach significance only for women who worked in industries where more men said they were unable to work as a result of COVID-19 in the summer of 2020. Differences in employment losses and the likelihood of working from home by occupation and industry have modest impacts that are indistinguishable from zero.

Living with children under age 6 is also predictive of labor force exits, as is having children and working in a job paying low wages before the pandemic. Column 1 of table 2 shows that single women earning the mean wage before the pandemic living with children under age 6 were 3 percentage points more likely to leave the labor force relative to women who did not live with children–equivalent to the difference in labor force exits between women with a high school education and those with a post-graduate degree. We find evidence of relatively large effects of the combination of living with young children and having low earnings. The additional effect for women with children under age 6 of a one standard deviation decline in pre-pandemic wages was an increased rate of exit of nearly 3 percentage points, while for women living with children aged 6 to 12, it was an increase of 2 percentage points. Additionally, we find that married women living with children under

Table 2: Predictors of Labor Force Exits

| | (1) Exit | (2) Interest | (3) Caregiving |
|---|---|---|---|
| Less than High School | 0.081 | -0.006 | 0.067 |
| | (0.017) | (0.013) | (0.025) |
| High School or GED | 0.018 | -0.005 | 0.020 |
| | (0.002) | (0.008) | (0.005) |
| Bachelor's degree (only) | -0.006 | -0.008 | 0.002 |
| | (0.003) | (0.005) | (0.005) |
| More than a bachelor's degree | -0.014 | -0.011 | 0.001 |
| | (0.004) | (0.005) | (0.003) |
| Previous weekly wage (normalized) | -0.011 | -0.002 | -0.006 |
| | (0.005) | (0.002) | (0.004) |
| Industry emp change | -0.006 | -0.015 | 0.027 |
| | (0.048) | (0.027) | (0.039) |
| Industry share working from home | -0.006 | 0.003 | -0.019 |
| | (0.024) | (0.012) | (0.013) |
| Industry share unable to work due to COVID-19 | 0.071 | 0.064 | 0.054 |
| | (0.050) | (0.026) | (0.032) |
| Occupation emp change | -0.006 | 0.002 | -0.001 |
| | (0.018) | (0.010) | (0.009) |
| Occupation share working from home | -0.030 | -0.020 | -0.023 |
| | (0.023) | (0.008) | (0.018) |
| Occupation share unable to work due to COVID-19 | 0.024 | -0.011 | 0.011 |
| | (0.026) | (0.027) | (0.014) |
| Lived with a child aged 0 to 5 | 0.033 | 0.013 | 0.018 |
| | (0.011) | (0.009) | (0.012) |
| Lived with a child aged 6 to 12 | 0.011 | 0.015 | 0.022 |
| | (0.013) | (0.006) | (0.009) |
| Was married | 0.012 | -0.000 | 0.018 |
| | (0.006) | (0.003) | (0.005) |
| Wage (normalized) by living with child aged 0 to 5 | -0.028 | -0.015 | -0.029 |
| | (0.010) | (0.004) | (0.010) |
| Wage (normalized) by living with child aged 6 to 12 | -0.019 | -0.013 | -0.020 |
| | (0.008) | (0.001) | (0.006) |
| Married by living with child aged 0 to 5 | 0.029 | 0.010 | 0.047 |
| | (0.016) | (0.008) | (0.017) |
| Married by living with child aged 6 to 12 | -0.002 | -0.014 | 0.003 |
| | (0.014) | (0.008) | (0.012) |
| Observations | 8,745 | 8,745 | 8,745 |
| Age cubic | X | X | X |
| Race and ethnicity indicators | X | X | X |
| Month fixed effects | X | X | X |
| State fixed effects | X | X | X |

Note: Shown are coefficients from linear probability models predicting labor force exits, labor force exits attributed to caregiving, and exits in excess of historical patterns ($\beta_2$ terms in equation 2). The estimation samples for the first two columns are prime-working-age women from September 2020 to February 2021 who were employed one year earlier in the Current Population Survey. The last column also includes women observed from September 2015 to February 2020 as the group representing historical patterns. An X indicates inclusion of a control.

age 6 were 4 percentage points more likely to exit than their single counterparts. The larger impacts for women living with children and those earning low wages, suggest the importance of affordable childcare generally and highlight the issues surrounding childcare and schooling disruptions during the pandemic that we explore further in the remainder of the paper.

### Exits Related to Caregiving

The underlying characteristics of women who said that caregiving was the reason they exited the labor force are similar to those predicting overall pandemic labor force exits. Column 2 of table 2 shows that women with less than a high school degree were about 7 percentage points more likely to say they were not working due to caregiving, only slightly lower than their 8 percent higher rate of exits overall. The results are consistent with, but do not definitively show, workplace flexibility helping with caregiving (Alon et al., 2020). Having a higher share of men working from home in a woman's industry and occupation (insignificantly) predicts lower rates of labor force exits attributed to caregiving. Also, married women and women living with children are more likely to say they left the labor force for reasons related to caregiving during the pandemic. Married women were 2 percentage points more likely to exit the labor force and say that caregiving was the reason, and the effect of living with young children was particularly strong for married women in predicting their labor force exit due to caregiving. While lower-earning women had higher labor force exits overall, those associated with caregiving were concentrated among lower-earning women living with children.

### Exits Expressing Work Interest

Pandemic-era exits where women report interest in working were more common among women living with children and women working in industries where work was disrupted. Column 3 of table 2 shows that pandemic-era exits associated with work interest were higher among women living with children, especially lower-earning women living with children. Interestingly, there are no strong differences by income or education by themselves, as in the previous two columns suggesting

that the group of women who exited the labor force but express interest in working may be distinct from general pandemic exits. Overall, the results suggest that childcare concerns are a main driver of these exits and will be more relevant than labor market differences by education and wages in determining formerly employed women's labor force participation after the pandemic.

## Impacts of the Pandemic

To understand how labor force exits changed during the pandemic relative to the years before it, we examine predictors of exits before the pandemic. Then we estimate differences in the increases in rates of exits during the pandemic for women with different characteristics.

### Exits Before the Pandemic

Many predictors of labor force exits during the pandemic were also relevant in the years before the pandemic. Column 1 of table 3 shows that pre-pandemic exits were more common for women with less education and women with lower wages, just as they were more common for these groups during the pandemic.

Another finding that mirrors behavior during the pandemic is the significance of the interaction between being married and having a child under the age of 6. This suggests that employed, married women living with young children generally have higher rates of labor force exit. We also find that lower earning women living with young children have higher rates of exits than higher earning women, but this difference did not change during the pandemic.[12]

Overall, many of the same characteristics that are predictive of exits during the pandemic were also predictive before the pandemic, creating a challenge for identifying the impact of the pandemic on exits. Interestingly, the industries and occupations where our constructed pandemic-era employment disruptions were largest also were industries and occupations with higher pre-pandemic rates of exit (column 2 of table 3). Women who worked in industries that had larger employment

[12]Our analysis cannot speak to differences in entry rates although women living with young children who are not employed may also be more likely than other groups to enter the labor force.

Table 3: Pre-pandemic Exits and Excess Exits During the Pandemic

| Variables | (1) Before | (2) Before | (3) Excess Exits |
|---|---|---|---|
| Less than High School | 0.063 | 0.057 | 0.024 |
| | (0.014) | (0.014) | (0.021) |
| High School or GED | 0.017 | 0.014 | 0.004 |
| | (0.004) | (0.004) | (0.005) |
| Bachelor's degree (only) | -0.004 | -0.002 | -0.003 |
| | (0.003) | (0.003) | (0.004) |
| More than a bachelor's degree | -0.009 | -0.006 | -0.008 |
| | (0.004) | (0.004) | (0.005) |
| Previous weekly wage (normalized) | -0.012 | -0.010 | -0.001 |
| | (0.001) | (0.002) | (0.004) |
| Industry employment change | | -0.021 | 0.015 |
| | | (0.011) | (0.045) |
| Industry share working from home | | 0.009 | -0.015 |
| | | (0.008) | (0.024) |
| Industry share unable to work due to COVID-19 | | 0.028 | 0.043 |
| | | (0.015) | (0.049) |
| Occupation emp change | | -0.009 | 0.003 |
| | | (0.008) | (0.019) |
| Occupation share working from home | | -0.017 | -0.014 |
| | | (0.006) | (0.022) |
| Occupation share unable to work due to COVID-19 | | 0.012 | 0.012 |
| | | (0.015) | (0.029) |
| Lived with a child aged 0 to 5 | -0.018 | -0.019 | 0.052 |
| | (0.005) | (0.005) | (0.011) |
| Lived with a child aged 6 to 12 | 0.000 | 0.000 | 0.011 |
| | (0.004) | (0.004) | (0.012) |
| Was married | 0.002 | 0.003 | 0.009 |
| | (0.003) | (0.003) | (0.006) |
| Wage (normalized) by living with child aged 0 to 5 | -0.019 | -0.019 | -0.009 |
| | (0.003) | (0.003) | (0.010) |
| Wage (normalized) by living with child aged 6 to 12 | 0.001 | 0.001 | -0.020 |
| | (0.003) | (0.002) | (0.007) |
| Married by living with child aged 0 to 5 | 0.052 | 0.052 | -0.023 |
| | (0.007) | (0.008) | (0.017) |
| Married by living with child aged 6 to 12 | 0.009 | 0.008 | -0.010 |
| | (0.005) | (0.005) | (0.014) |
| Observations | 40,801 | 40,533 | 49,278 |
| Age cubic | X | X | X |
| Race and ethnicity indicators | X | X | X |
| Month fixed effects | X | X | X |
| State fixed effects | X | X | |
| State by pandemic fixed effects | | | X |
| Main effects | | | X |

Note: Pre-pandemic exits were more common for women with less education, women with lower earnings, and married women with children age 5 and under. Exits increased during the pandemic among all women with children under age 6 and women who earned less and had children aged 6 to 12. Columns 1 and 2 show coefficients ($\beta_0$) from the linear probability models in equations 1 for the period from 2015 to 2019 . Column 3 shows the interaction terms ($\beta_2$) in equation 2 for the period from 2015 to the end of the sample. Column 3 includes the pre-pandemic period was well as September 2020 to February 2021.

contractions during the pandemic and occupations that had lower shares working form home during the pandemic were more likely to leave the labor force even before the pandemic.

The next section directly addresses this challenge by estimating impacts on exits during the pandemic in excess of behavior before the pandemic.

### Excess Exits During the Pandemic

Next, we examine predictors of exits in excess of pre-pandemic trends. Focusing on exits in excess of historical trends ($\beta_2$ in equation 2) allows us to highlight changes in women's labor force participation that likely would not have occurred in the absence of the pandemic.[13]

Our main finding is that, after controlling for many covariates, women who live with children experienced greater increases in their exit rates during the pandemic. The effects are most pronounced among those living with children under age 6, single women, and lower-earning women. The estimated effects are large relative to the overall 2 percentage point decline in labor force participation during the pandemic. We find that the effect of other measures, including industry and occupational impacts of COVID-19, the direct effect of wages before the pandemic, and education are statistically undetectable and economically modest or small.

The characteristic associated with the largest effect on excess exits was living with children under age 6 before the pandemic, and the estimated effect varies with marital status and pre-pandemic earnings. The coefficient on living with a child under age 6 in column 3 of table 3 shows that living with a child under age 6 was associated with 5 percentage points higher excess exits among single women earning average wages relative to similar single women with no children in the household. Living with a child under age 6 was also associated with 3 percentage points higher excess exits among married women earning average wages.[14] The estimate of living with a young child interacted with standardized pre-pandemic

[13] Specifically, the estimates represent a difference in difference where we are comparing the change in exits for a woman with certain characteristics to those of the reference group during the pandemic relative to labor force exits between 2015 to 2019.

[14] The implied effect is statistically significant at the one percent level (standard error: 0.0096).

wage leves is statistically insignificant, but the estimate suggests that the increase in exits was higher for lower-earning women.

Although excess exits increased the most for women living with young children, our results suggest that for women living with children between ages 6 and 12, excess exits were concentrated among lower-earning women. Specifically, we estimate that a woman with earnings one standard deviation below the mean pre-pandemic wage living with a school-aged child had a statistically significant 2.1 percentage point larger increase in labor force exits relative to a woman with the same aged children with average earnings.[15] The large estimated effect of the interaction between earnings and the presence of school-aged children stands in contrast to the small and statistically insignificant coefficients on the direct effect of weekly earnings (-0.1 percentage points), the direct effect of having a child aged 6 to 12 (1.0 percentage points), and the interaction between married status and living with a child aged 6 to 12 (-1.0 percentage points). One explanation for the higher rates of exit among lower-earning women with school-age children is a loss of school as a mode of childcare. Additionally rates of homeschooling increased during the pandemic, which may have more difficult to combine with work for lower-income women or women who were unable to work remotely (Musaddiq et al. (2021)).

It is notable that single women living with young children were less likely to exit than married women before the pandemic as shown in columns 1 and 2; however, during the pandemic they had larger increases in exit rates.[16] One hypothesis voiced early in the pandemic was that childcare disruptions could lead more women with small children and working husbands to drop out of the labor force, in response to the gap in men's and women's wages and the demands of two parents working full time.[17] However, the negative coefficients on the interaction between being married and living with children suggests that the pandemic has not resulted in larger increases in labor force exits for married women relative to unmarried women.

Beyond variables connected to children we find that other factors were not very

[15]This includes the direct effect of earning lower wages although the direct estimated effect is economically small at 0.1 percentage points and statistically insignificant.

[16]The same qualitative pattern holds for women living with children aged 6 to 12, but the estimated effects are smaller.

[17]Alon et al. (2020) and Goldin (2020) mention this hypothesis.

predictive of additional exits during the pandemic. Excess exits are monotonically decreasing by education, though point estimates are insignificantly different from zero and generally small in magnitude. We also find small and statistically insignificant associations with pre-pandemic wages and industry and occupational impacts of COVID-19. Interestingly the factors predicting excess exits are similar to those predicting pandemic-era exits associated with being interested in employment shown in table 2.

**Overall impacts** In addition to the direct impacts on women and their careers, labor force exits due to childcare interruptions could be contributing to lower levels of overall employment. While the impacts of caregiving on employment levels is beyond the scope of our examination, we can use our estimates to calculate the share of exits attributable to having children in the household. The calculation assumes that women living with children would otherwise have had the same increases in labor force exits as similar women without children under 13 in the household. This estimate requires that there are no general equilibrium or "crowding" effects of women with children on women without, and we need to assume that the differences we estimate are due to childcare disruptions and virus concerns relating to children and not unobserved differences between women with kids and those without. While neither assumption is likely to be completely true, we believe that the exercise still provides a useful estimate.

Based on our regression estimates, the increase in labor force exits among prime-working-age women would be 0.8 percentage points smaller if women living with children experienced the same increases in exits as those without children under 13 in the home. A 0.8 percentage points smaller increase would roughly halve the 1.6 percentage point increase in excess exits comparing our pandemic sample period of September 2020 to February 2021 to our comparison period of February 2015 to 2020. While our estimates do not suggest that all of the increase in exits among women during the pandemic was related to childcare, they do suggest that childcare played a major role.

## Decomposing Differences by Race and Ethnicity

Next, we use Oaxaca style decompositions to examine the extent to which observable characteristics explain why Latinas and Black women were more likely than White women to exit the labor force during the COVID-19 crisis. These decompositions show three things. First, they show that covariates only explain about half of the gap for Latinas and between 15 to 30 percent of the gap for Black women. Second, they show that differences in education, wages, and job characteristics are the most important observed characteristics for explaining the higher rates of labor force exits among Latinas and Black women, both before and during the pandemic. Third, and finally, that the biggest contributor in explaining why women of color had larger pandemic-era increases in labor force exits relative to White women was the fact that having children was more predictive of labor force exits during the pandemic. This result is consistent with our earlier findings that the presence of children was predictive of excess exits during the pandemic overall.

As shown in table 4, differences in observed covariates cannot explain all of the racial gaps in labor force exits, suggesting that discrimination and/or other unobserved differences played a role. Covariates explain around half of Latinas' six percentage point higher likelihood of leaving the labor force relative to White women during the pandemic. Covariates explain about half of the gap for Latinas before the pandemic as well. For Black women, covariates explain around one percentage point, or one quarter, of their four percentage point higher likelihood of exit compared to White women during the pandemic. Covariates are also less predictive of differences between Black and White women before the pandemic.

Education, industries, occupations, and wages describe the largest proportion of the cross sectional differences in exits relative to White women both during and before the pandemic. These differences are shown in the first three rows of table 4. Education, industries, occupations, and wages account for 90 percent of the explained differences for Latinas and more than 100 percent of explained differences for Black women.

Looking at the differences in contributions during the pandemic relative to before, the biggest changes relate to the interaction terms between marital status, wages, and the presence of children. Importantly, the effect of these characteris-

tics was to increase exits during the pandemic for women of color relative to White women, while they actually were associated with the opposite effect prior to the pandemic. We show the differences in the contributions between before and during the pandemic in columns 3 and 6. The larger contributions of the household interaction terms alone explain much of the increase in the gap in exits for both Latinas and Black women relative to White women. Specifically, the presence of children and their interaction with wages and marital status explain most of the explained increase for Black women relative to White women and around half of the explained increase for Latinas relative to White women.

Table 4: Oaxaca Style Decomposition of Gaps in Exits During the Pandemic

| | | Latina | | | Black | |
|---|---|---|---|---|---|---|
| Variable groupings | Before | During | Difference | Before | During | Difference |
| Education | 0.009 | 0.012 | 0.003 | 0.002 | 0.004 | 0.002 |
| | (0.002) | (0.004) | | (0.001) | (0.001) | |
| Industry and occupation impacts | 0.003 | 0.007 | 0.004 | 0.001 | 0.003 | 0.002 |
| | (0.001) | (0.002) | | (0.000) | (0.002) | |
| Wages | 0.005 | 0.008 | 0.003 | 0.003 | 0.004 | 0.001 |
| | (0.001) | (0.002) | | (0.001) | (0.001) | |
| Married | 0.000 | -0.001 | -0.001 | -0.001 | -0.004 | -0.003 |
| | (0.000) | (0.001) | | (0.001) | (0.002) | |
| Household | -0.001 | 0.002 | 0.003 | 0.000 | 0.001 | 0.001 |
| | (0.001) | (0.001) | | (0.000) | (0.001) | |
| Household interactions | 0.000 | 0.005 | 0.005 | -0.003 | 0.002 | 0.005 |
| | (0.001) | (0.002) | | (0.001) | (0.002) | |
| Age | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | (0.000) | (0.000) | | (0.000) | (0.000) | |
| State | 0.002 | 0.001 | -0.001 | 0.001 | 0.000 | -0.001 |
| | (0.001) | (0.003) | | (0.001) | (0.002) | |
| Level | 0.0813 | 0.117 | 0.036 | 0.0691 | 0.0968 | 0.028 |
| Difference | 0.035 | 0.060 | 0.025 | 0.023 | 0.040 | 0.017 |
| Explained | 0.019 | 0.033 | 0.014 | 0.004 | 0.011 | 0.007 |
| Observations | 40,533 | 8,745 | | 40,533 | 8,745 | |

Note: Around half of the difference between Latinas and White women, and around a quarter of the difference between Black and White women, is explained by covariates both before and after the pandemic. Education and job characteristics do the most to explain differences. The explanatory power of the interactions between the presence of children and wages as well as marital status increased markedly during the pandemic. This table shows a detailed decomposition of the contributions of the various groupings of variables shown in each row in explaining the higher rate of exits among Latina and Black women relative to White women before and in the period ending from September 2020 to February 2021, labeled Pandemic. An additional column shows the difference in the contributions in the two periods. The next group of rows show the number of observations used to estimate the model, the level of exits for Latinas or Black women, the difference with White women, and the difference with White women that is explained by the model. The last row gives the number of potential exits used to estimate the model, including women of all races and ethnicities.

The decompositions suggest that the higher rates of exit of women living with young children earning relatively low wages heightened differences in exit rates for Latina and Black women relative to White women. Our analysis also suggests that differences in education and occupational sorting as well as unobserved factors, like discrimination or unobserved labor supply factors, play meaningful roles in Latina and Black women's higher rates of labor force exits both before and during the pandemic.

# IV Conclusion

This paper investigates patterns in the overall decline in women's labor force participation during the COVID-19 pandemic. We highlight larger declines in labor force participation among Latinas and Black women that were driven by labor force exits. These led to increases in the share of women of color who, while out of the labor force, express some interest in working. Additionally, we find that women living with children under age 6, particularly single women, were more likely to exit the labor force during the pandemic than in previous periods. Women living with school-age children working at low-earning jobs were also more likely to exit than before the pandemic. Finally, increases in exits among women with small children contributed to the larger increases in labor force exits among Latina and Black women during the pandemic.

Disaggregating women's labor force participation is an obvious first step in understanding how public health concerns, government-mandated shutdowns, and widespread societal changes during the COVID-19 pandemic will change women's careers and lives, even after the pandemic has ended. These results serve as a bridge for understanding the medium- and long-term labor market outcomes of the well-documented short-run effects of the COVID-19 pandemic. For example, patterns by race, ethnicity, education, and pre-pandemic income are all continuations of labor market trends earlier in the pandemic ((Cortes and Forsythe, Forthcoming; Couch, Fairlie and Xu, 2020)).

Changes in women's labor force participation during the pandemic highlight the importance of reliable childcare for women's labor force participation. Since the

childcare disruptions caused by the COVID-19 pandemic were different from the cost shocks explored in previous work (Morrissey, 2017), the coincident increase in labor force exits among women living with children suggest that regular, reliable, and available childcare plays an important role in supporting women's labor force participation (Compton and Pollak, 2014). The characteristics of the women who experienced excess exits during the pandemic mirror previous examinations of the disproportionate effects of childcare costs on labor force participation, with larger effects for single women, women with children under age 6, and women earning lower wages before the pandemic (Morrissey, 2017).

Our results are also important for policymakers trying to develop measures to grow the economy and address the disparities outlined in our paper. Our finding that the presence of children is most associated with women's excess pandemic-era exits lends some support to interventions that make childcare more reliable, available, and affordable to reverse these declines in labor force participation. Indeed, a back of the envelope calculation suggests that around half of the increase in prime-working-age women's labor force exits during the pandemic was due to larger increases in exits attributable to living with children under age 13. The effectiveness of policy interventions will depend on the trajectory of the pandemic. However, addressing disparities in labor force participation by gender, race, and ethnicity will contribute to a more inclusive and equitable economic recovery.

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# V Appendix

## Women Outside the Labor Force: Caregiving and Interest in Working Trends

In this section, we show that the labor force patterns for women described in the paper are mirrored by increases in the share of women outside the labor force stating that caregiving is the reason. In addition, we show similar increases in the share of women who are out of the labor force but indicate some interest in working. Below we show the patterns for all women and among those who were previously employed. As in the paper, we break down the patterns by race and ethnicity and by the presence of children.

Figure 3 shows that the proportion of women not in the labor force who cite caregiving reasons rose during the pandemic with higher percentage point increases among Black women and Latinas. The plot uses a question asked in the CPS of women who are outside of the labor force and say that they are taking care of house or family when asked if they were "disabled, ill, in school, taking care of house or family, or something else." There was an increase in women who were not in the labor force and who cite this category early in the pandemic for women of all races and ethnicities. The trend persisted for Latinas and Black women in particular, whose increases during the pandemic were between 1 and 2 percentage points larger than those for White women beginning in the fall of 2020. When we look at increases among women who exited the labor force in panel B, we see

that through January 2021 Black women and Latinas had larger percentage point increases in the caregiving measure.

Figure 4 shows that increases in women stating caregiving as the reason they are out of the labor force were larger among women living with children, and that remained true through 2021. Women living with children under age 13 saw nearly a 3 percentage point increase in the share out of the labor force for caregiving reasons relative to a 1 percentage point increase among women living with no children under age 13. The differences are particularly stark among women who were previously employed where those living with children had even sharper increases in the share out of the labor force for caregiving reasons. The differences by presence of children are particularly persistent.

Figure 5 shows that the proportion of women not in the labor force who responded that they either intend to look for employment during the next year or want a job currently increased for all women, but by larger amounts for Black women and Latinas. The increase has declined among all racial groups but remains elevated relative to pre-pandemic levels. Similar to patterns shown in the caregiving response, the increase among Black women and Latinas is persistent and concentrated among those who were previously employed before to the pandemic.

Figure 6 shows that increases in women who are out of the labor force but express interest in working increased for all women during the pandemic. We do not see much difference in the percentage point increases for women living with children compared to those who do not. Among previously employed women, we see slightly larger percentage point increases among those living with children under age 13, but the differences are smaller than the ones seen across racial groups.

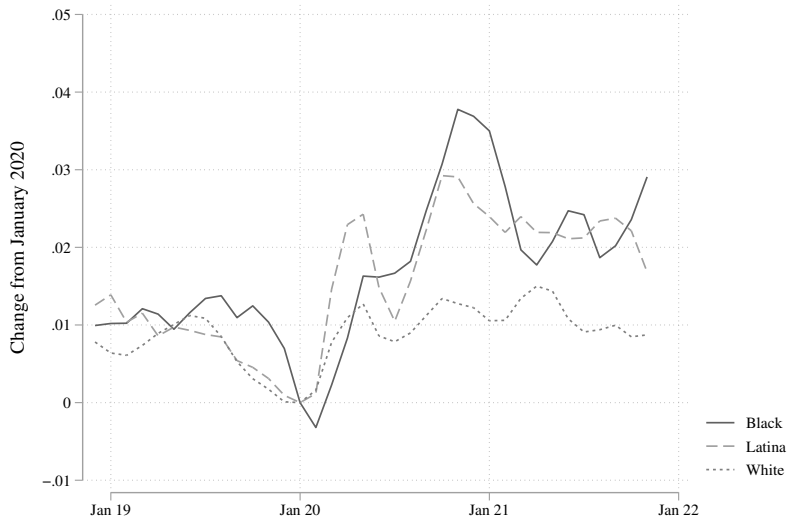
## Comparisons with Men

This brief appendix provides a baseline analysis for men that is similar to the one we present in the main text for women. We do not include men in the main text in the interest of parsimony because we do not observe the same differences by race and presence of children in labor force participation among men.

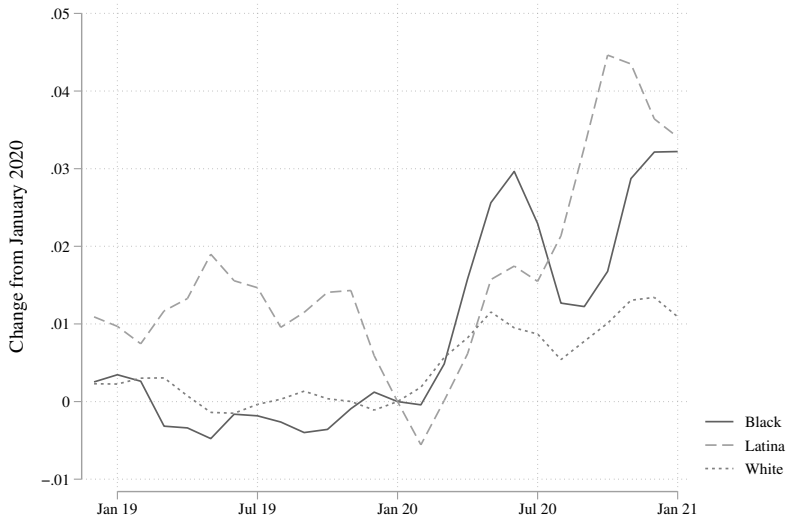
One similarity between men and women is the severe initial impacts of the COVID

Figure 3: Women Not in the Labor Force by Race: Caregiving Reasons

Panel A: All



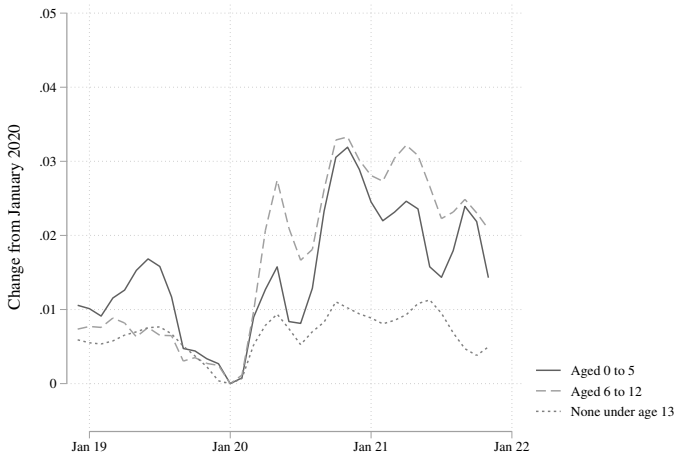

Panel B: Previously Employed



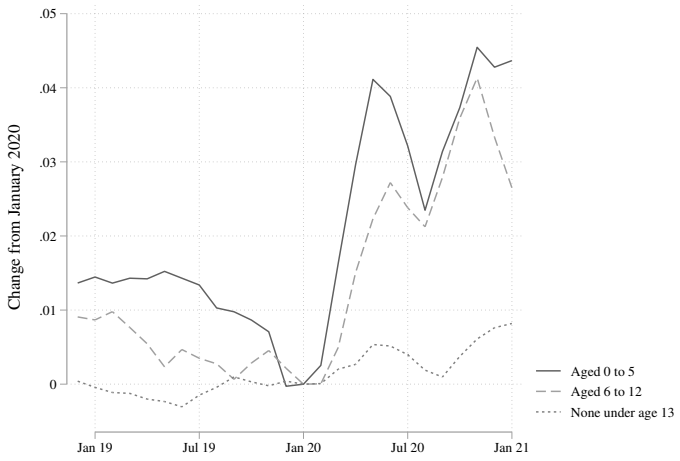

Note: Plotted are three month moving average changes in the rates of respondents not in the labor force stating caregiving as a reason among prime-working-age women by race and ethnicity. Each is adjusted for monthly seasonality based on average monthly values from January 2003 to February 2020. Statistics are weighted using sampling weights. Data are from the Current Population Survey downloaded from IPUMS Flood et al. (2020).

Figure 4: Women Not in the Labor Force by Presence of Children: Caregiving Reasons

Panel A: All



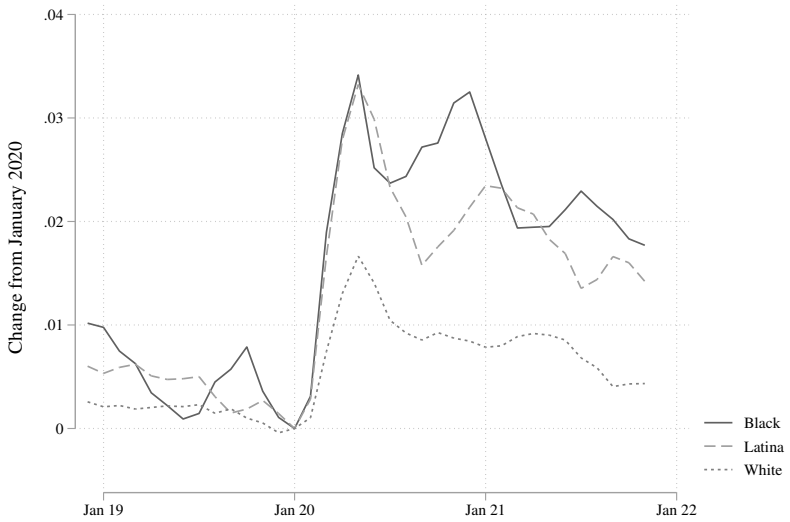

Panel B: Previously Employed




Note: Plotted are three month moving average changes in the rates of respondents not in the labor force stating caregiving as a reason among prime-working-age women by the presence of children aged 0 to 5 and aged 6 to 12 before the pandemic. Each is adjusted for monthly seasonality based on average monthly values from January 2003 to February 2020. Statistics are weighted using sampling weights. Data are from the Current Population Survey downloaded from IPUMS Flood et al. (2020).

Figure 5: Women Expressing Interest in Working Changes by Race and Ethnicity

Panel A: All

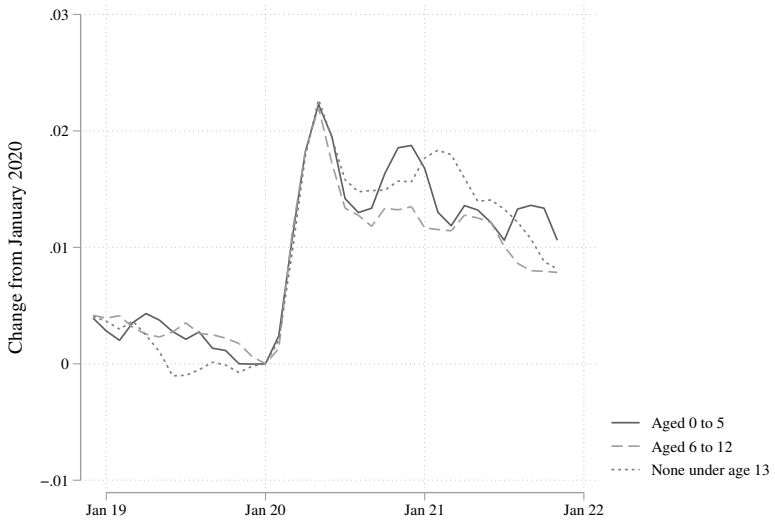



Panel B: Previously Employed

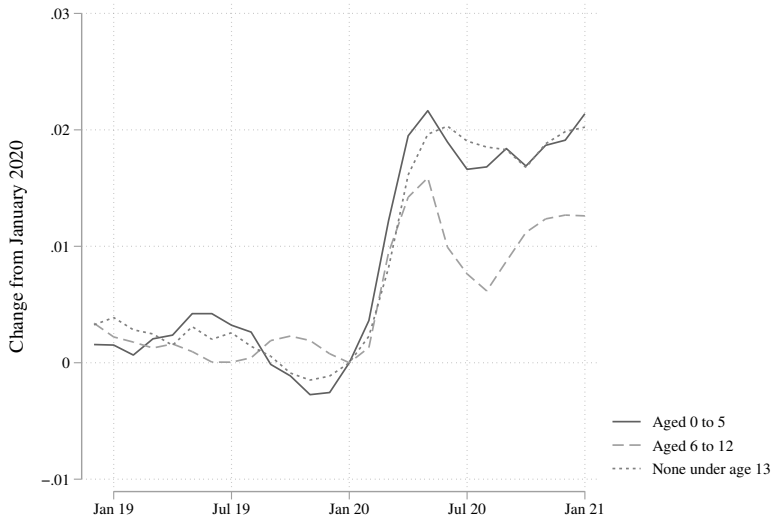

Note: Plotted are three month moving average changes in the rates of respondents expressing interest in working among prime-working-age women by race and ethnicity. Each is adjusted for monthly seasonality based on average monthly values from January 2003 to February 2020. Statistics are weighted using sampling weights. Data are from the Current Population Survey downloaded from IPUMS Flood et al. (2020).

Figure 6: Women Expressing Interest in Working Changes by Presence of Children

Panel A: All




Panel B: Previously Employed




Note: Plotted are three month moving average changes in the rates of respondents expressing interest in working among prime-working-age women by the presence of children age 0 to 5 and age 6 to 12 before the pandemic. Each is adjusted for monthly seasonality based on average monthly values from January 2003 to February 2020. Statistics are weighted using sampling weights. Data are from the Current Population Survey downloaded from IPUMS Flood et al. (2020).

pandemic on labor force participation among workers of color. Figure 7 shows that initial declines in labor force participation were over 3 percentage points for Black men and Latinos compared to around 2 percentage points among White men. In contrast to the labor force patterns documented for women, starting in the fall of 2020 men of color had declines in labor force participation that were more similar to White men. This is also true among the previously employed (panel B).

Men and women's patterns of labor force participation look very different when we separate changed by the presence of children. Figure 8 shows that men regardless of whether children were in the household left the labor force, but the patterns look similar across the groups. The same is true when we focus on the previously employed.

## Robustness

Table 5 shows that the findings from our analysis of women's excess exits during the pandemic are robust to alternative specifications. It shows increasingly detailed specifications in terms of controls, with column 4 representing the result in column 4 of table 2 and column 5 representing the same specification without weights.

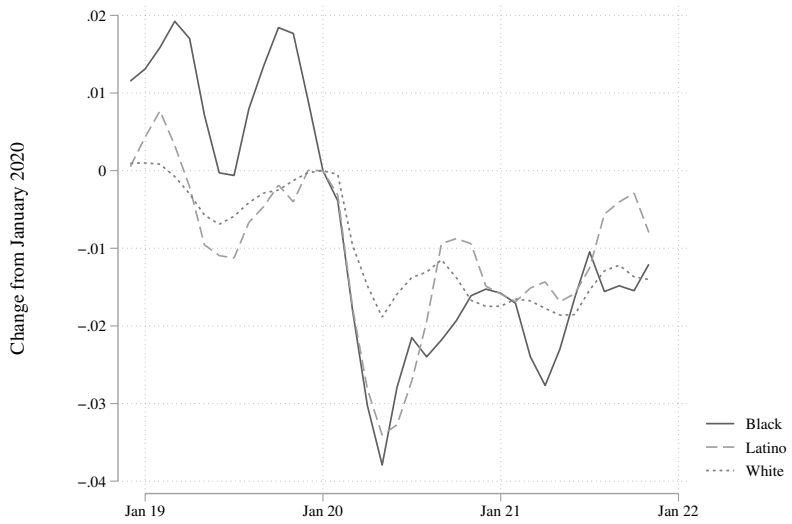
Moving across specifications, living with a child under age 6 is strongly and statistically significantly associated with excess labor force exits during the pandemic. Estimates range from 3 percentage points in column 1 to 6 percentage points in column 7. Controls and weights also generally increase the effect size.

Living with a child aged 6 to 12 and earning low wages before the pandemic is similarly robustly predictive across specifications where it is included. Effect sizes for the interaction term are tightly centered around 2 percentage points in column 4, and statistically different from zero.

Additionally, column 6 includes a positive and significant linear term for the number of children aged 0 to 12. So even after controlling for the presence of children in each age bin, having an additional child under 13 increases the likelihood of an excess exit by a percentage point. Column 7 includes separate indicators for the number of children and they are statistically indistinguishable from zero, but importantly the effect of living with a child aged 0 to 5 and aged 6 to 12 remains

Figure 7: Male Labor Force Participation Changes by Race and Ethnicity

Panel A: All

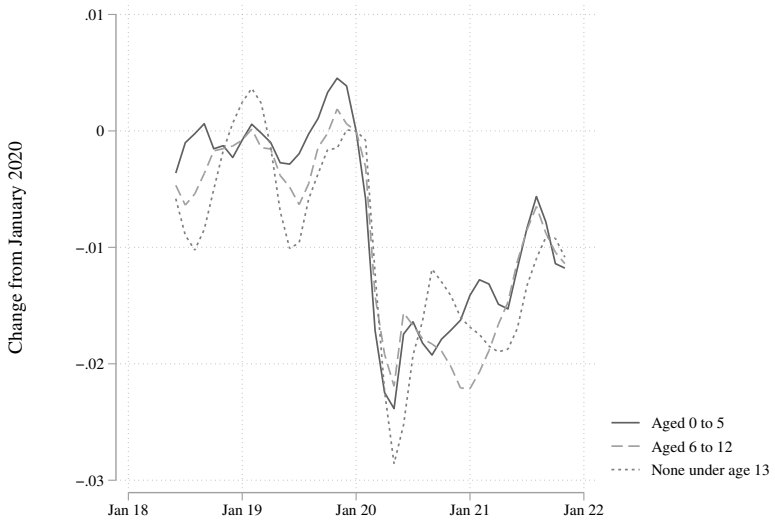



Panel B: Previously Employed

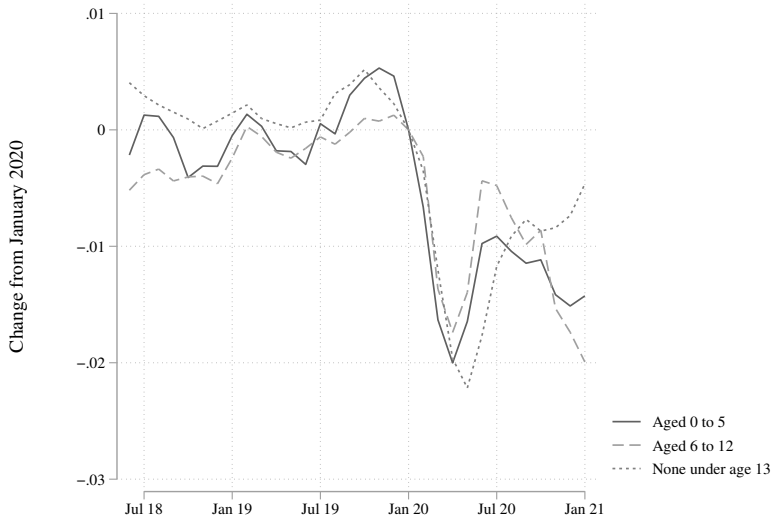

Note: Plotted are three month moving average labor force participation rates for prime-working-age men by race, and ethnicity. Each is adjusted for monthly seasonality based on average monthly values from January 2003 to February 2020. Statistics are weighted using sampling weights. Data are from the Current Population Survey downloaded from IPUMS Flood et al. (2020).

Figure 8: Male Labor Force Participation Changes by Presence of Children

Panel A: All




Panel B: Previously Employed




Note: Plotted are three month moving average labor force participation rates for prime-working-age men by the presence of children age 0 to 5 and age 6 to 12 before the pandemic. Each is adjusted for monthly seasonality based on average monthly values from January 2003 to February 2020. Statistics are weighted using sampling weights. Data are from the Current Population Survey downloaded from IPUMS Flood et al. (2020).

similar in magnitude.

Finally, moving beyond the statistically significant results highlighted, the other coefficients remain statistically indistinguishable from zero.

Table 5: Robustness of Children's Association with Excess Exits

| | (1) Excess exits | (2) Excess exits | (3) Excess exits | (4) Excess exits | (5) Excess exits | (6) Excess exits | (7) Excess exits |
|---|---|---|---|---|---|---|---|
| Lived with a child 0 to 5 | 0.031 | 0.049 | 0.048 | 0.052 | 0.036 | 0.040 | 0.058 |
| | (0.008) | (0.012) | (0.013) | (0.011) | (0.012) | (0.014) | (0.016) |
| Lived with a child 6 to 12 | 0.011 | 0.015 | 0.014 | 0.011 | 0.005 | -0.001 | 0.020 |
| | (0.009) | (0.013) | (0.013) | (0.012) | (0.010) | (0.014) | (0.015) |
| Was married | 0.001 | 0.013 | 0.014 | 0.009 | 0.008 | 0.009 | 0.009 |
| | (0.007) | (0.007) | (0.007) | (0.006) | (0.005) | (0.006) | (0.007) |
| Wage (normalized) by living with child 0 to 5 | | -0.007 | -0.007 | -0.009 | -0.007 | -0.009 | -0.008 |
| | | (0.010) | (0.010) | (0.010) | (0.007) | (0.010) | (0.010) |
| Wage (normalized) by living with child 6 to 12 | | -0.018 | -0.019 | -0.020 | -0.017 | -0.019 | -0.019 |
| | | (0.007) | (0.007) | (0.007) | (0.008) | (0.008) | (0.008) |
| Married by living with child 0 to 5 | | -0.030 | -0.030 | -0.023 | -0.009 | -0.024 | -0.024 |
| | | (0.018) | (0.017) | (0.017) | (0.016) | (0.017) | (0.017) |
| Married by living with child 6 to 12 | | -0.014 | -0.012 | -0.010 | -0.002 | -0.012 | -0.011 |
| | | (0.015) | (0.015) | (0.014) | (0.013) | (0.014) | (0.014) |
| Previous weekly wage (normalized) | | -0.004 | -0.005 | -0.001 | -0.005 | -0.001 | -0.001 |
| | | (0.003) | (0.004) | (0.004) | (0.004) | (0.004) | (0.004) |
| Number of children 0 to 12 | | | | | | 0.010 | |
| | | | | | | (0.004) | |
| One child 0 to 12 | | | | | | | -0.013 |
| | | | | | | | (0.019) |
| Two children 0 to 12 | | | | | | | -0.015 |
| | | | | | | | (0.020) |
| Three or more children 0 to 12 | | | | | | | 0.001 |
| | | | | | | | (0.022) |
| Observations | 49,278 | 49,278 | 49,278 | 49,278 | 49,278 | 49,278 | 49,278 |
| Weights | X | X | X | X | | X | X |
| Race and ethnicity indicators | X | X | X | X | X | X | X |
| Main effects | X | X | X | X | X | X | X |
| Education occupation and industry controls | | | | X | X | X | X |
| Age cubic | | | | X | X | X | X |
| State by pandemic fixed effects | | | X | X | X | X | X |
| Month fixed effects | | | X | X | X | X | X |

Note: Table shows robustness of the predictors in table 2 to alternative specifications. See the notes in table 2 for more details.