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

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Abstract

While the descriptive impacts of the pandemic on women have been well documented in the aggregate, we know much less about the impacts of the pandemic on different groups of women. After controlling for detailed job and demographic characteristics, including occupation and industry, we find that the pandemic led to significant excess labor force exits among women living with children under age six relative to women without children. We also find evidence of larger increases in exits among lower-earning women. The presence of children predicted larger increases in exits during the pandemic among Latina and Black women relative to White women. Overall, we find evidence that pandemic induced disruptions to childcare, including informal care from family and friends. Our results suggest that the unique effect of childcare disruptions during the pandemic exacerbated pre-existing racial and income inequalities among women.

Keywords: Women, Labor Force Participation, Race, Ethnicity, Labor Supply, COVID-19
JEL Numbers: J16, J70, H31, I14, I18

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†Corresponding author; Board of Governors of the Federal Reserve System; Mail Stop I-303; 20th Street and Constitution Avenue N.W.; Washington, DC 20551; mike.zabek@frb.gov. Additional results and copies of the computer programs used to generate the results presented in the article are available from the corresponding author. The opinions, analysis, and conclusions are those of the authors and do not indicate concurrence by the Federal Reserve Board, the Federal Reserve System, anyone associated with these organizations, or anyone else. Additionally, the findings and conclusions in this presentation are those of the authors and should not be construed to represent any official USDA or U.S. Government determination or policy. This research was supported in part by the U.S. Department of Agriculture, Economic Research Service. **Data Availability Statement:** Data used for the study are publicly available via Flood et al. (2020). Programs and datasets generated during and/or analysed during the current study are also available from the corresponding author on reasonable request. **Other Statements and Declarations:** The authors declare that no funds, grants, or other support were received during the preparation of this manuscript. The authors have no relevant financial or non-financial interests to disclose. All authors contributed to the data analysis, writing, and revising of the paper. **Acknowledgments:** This project has benefited from comments from John Bound, David Buchholtz, Curie Chang, Jeff Larrimore, Alicia Lloro, Joshua Montes, Ryan Nunn, Jessica Ott, Christopher Smith, and Erin Troland, among others.

Disruptions during the first year of the COVID-19 pandemic affected women's working lives in many ways. Restrictions had direct effects on the ability to safely work in person while families' formal and informal childcare arrangements were interrupted. Daycare centers were closed, schools switched to remote learning, and health concerns restricted the ability of family and friends to care for children. These disruptions were not felt uniformly across women, and this paper demonstrates their unequal effects.

We build on previous work by isolating the role that children had on women's labor force exits relative to other women with comparable jobs in the United States. We find that the pandemic led more women with children under age six to leave the labor force. The pandemic also had unequal effects by income, race, and ethnicity. Our results suggest that childcare disruptions and increased caregiving responsibilities led to larger increases in exits among lower-earning women living with children compared to higher-earning mothers with similarly aged children. While factors relating to employment explain the largest share of the differences in exit rates between women of color and White women both before and during the pandemic, the effect of having children and the interactions of having children with women's pre-pandemic earnings and marital status became important explanatory factors during the pandemic. We find that industry and occupation played a smaller role, in contrast to their major role in employment losses during the early months of the pandemic (Cortes & Forsythe, 2023).

We use panel data to identify labor force exits of previously employed women during the first year of the pandemic to study the role that children and increased caregiving responsibilities played. We compare the likelihood of labor force exit between employed women with children and observably similar women who do not have children. We allow for the effect of children to differ based on interactions of children's ages, previous earnings, and marital status. The strategy allows us to condition on initial employment and to control for a rich variety of pre-pandemic characteristics, including earnings, occupation and industry level effects, and the differing geographic effects of the pandemic.

Our main specification compares women's exits during the pandemic with exits before the pandemic, because children also affected women's labor force exits before the pandemic. Specifically, we identify "excess exits" from the labor force during the pandemic above and beyond those expected based on the existing empirical relationships directly before the pandemic and during the Great Recession.

Our findings suggest that women's labor force exits during the pandemic amplified existing economic inequality based on two pieces of evidence. First, we estimate a larger effect of the pandemic on lower-earning mothers' labor force exits. Second, a decomposition shows that living with children helps to explain larger increases in labor force exits among Latinas and Black women relative to White women. Notably, differential effects of children by marital status and previous earnings

meaningfully contribute to labor force exit gaps during the pandemic, but are less important before it. Education, occupation, and industry also explain a large portion of the racial differences in exits, including the increased gaps during the pandemic. However, a substantial portion of the overall gaps as well as the increase in gaps remains unexplained, which could be attributable to differences in the effects of covariates by race and ethnicity, covariates that are not included in the analysis, or additional unmeasured differences.

Our results speak to the effects of childcare, including informal childcare provided by grandparents, on women's labor force participation and economic inequality. A substantial literature in labor economics studies the effects of formal childcare, focusing on variation in costs and availability of pre-K schooling.[1] A broader literature has emphasized the importance of often unmeasured non-market work, including informal childcare and some studies have used variation in workers' proximity to their children's grandparents to show that availability of informal care also affects parents' labor market outcomes.[2] We use the pandemic as a natural experiment to show what happened to mothers when all forms of childcare were severely constrained. The labor force exits we identify in the paper may have lasting negative effects on women's future earnings as workforce interruptions and lower levels of experience, which are more common for women, still contribute to the gender earnings gap (Blau & Kahn, 2017).

The results also add to the COVID-19 literature by focusing on heterogeneity between women that is otherwise obscured by a focus on overall differences between men and women. The patterns that we investigate by parenthood, race, and ethnicity are not as apparent when looking at men.[3] The differences between groups of women are also larger than those between men and women overall (C. Goldin, 2022).[4]

Our analysis of labor force participation a year into the pandemic also contextualizes the studies examining gender and demographic differences early on in the pandemic. In particular our results demonstrate the gendered effect of informal and formal child care disruptions as a result of of women's frequently larger role in informal caregiving.[5] Our general finding is that the labor supply related effects of childcare disruptions were larger contributors to labor force exits than

[1] See Morrissey (2017) for a survey.

[2] Ponthieux and Meurs (2015) provide a summary of literatures on gender and non-market work and Compton and Pollak (2014) and Krolikowski et al. (2020) have linked parents labor outcomes to their proximity to their children's grandparents.

[3] 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. See appendix figures 1 and 2 for details.

[4] Other papers investigating overall gender differences include: Leigh et al. (2021); Luengo-Prado (2021); Pitts (2021); Couch et al. (2022), Garcia and Cowan (2022); and Hansen et al. (2022).

[5] Augustine and Prickett (2022) document patterns in childcare time by gender in the U.S., showing increases among men and women while Costoya et al. (2022) show increases in unpaid activities were larger for women than men in Argentina.

were differences by women's occupation and industry. This finding is distinct with studies of the early pandemic months, which found very large differences in employment related to exposure by occupation and industry – including among women caregivers.[6]

Data

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 and the U.S. Bureau of Labor Statistics accessed from IPUMS (Flood et al., 2020).[7]

Nearly all of our analysis uses a linked longitudinal sample of individuals where we use an exact 12 month lag. Individuals in this main sample are observed twice: first at year and month t and second at year and month $t-12$. While the linking reduces the sample size substantially, it allows us to create a sample of individuals who were employed in their first sample observation and provides information on their job characteristics in year-month t.

Focusing on previously employed women allows us to measure the job characteristics of previously employed women and focuses the analysis on women who are attached to the labor force. The linking is particularly meaningful during the pandemic, when we are able to observe women in jobs before the pandemic's onset. So as to only include pre-pandemic jobs we we only include observations through February of 2021. Therefore the pre-pandemic observation is from February 2020 or before.[8]

Our sample includes prime-working-age women aged 25 to 54 who were employed twelve months before. We use information on employment and labor force status using the standard CPS definitions to categorize respondents as employed, unemployed, or not in the labor force.[9] All results using linked observations are weighted using longitudinal weights provided by IPUMS.

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

[6] Heggeness (2020); Russell and Sun (2020); and Albanesi and Kim (2021)

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

[8] For our main sample, we are linking respondents' surveys when they are in the outgoing rotation group since we rely on pre-pandemic earnings, which are only observed during certain months of the CPS.

[9] Since our sample of employed workers is from before March of 2020 and our main results use labor force participation, not unemployment, our measures are not subject to issues arising from the misclassification of workers who are on temporary layoff during the COVID pandemic.

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.

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 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 construct the measures using labor market experiences of men. We also increase our sample size in sometimes small (four digit) industries and occupations by pooling observations from May to August 2020.[10]

Finally, we normalize individuals' usual weekly earnings to control for earnings one year prior to year-month t. All demographic and employment variables are measured from the first observation, at $t-12$, while our outcomes are from the second observation.

Pandemic Patterns in Labor Force Exits

Policymakers and researchers have focused on the role of caring for children in explaining higher declines in labor force participation among women during the pandemic (Albanesi & Kim, 2021; Furman et al., 2021). As we show in figure 1, previously employed women in households with young children saw the sharpest increases in labor force exits, followed by women living with school-aged children. Women in households with no children under age 13 have exit rates that are only around 1 percentage point higher than before the pandemic.[11] The plot also shows that labor force exits were declining more so for women with young children before the pandemic meaning their larger pandemic increases represented a sharp break from previous trends.[12] In contrast to the patterns among women, there were relatively small differences in labor force exits between men with and without children as shown in appendix figure 1. Together, the results suggest that the presence of children influenced women's labor force participation more than they did for men, highlighting the effects of childcare disruptions combined with many women's larger roles

[10] 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.

[11] 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.

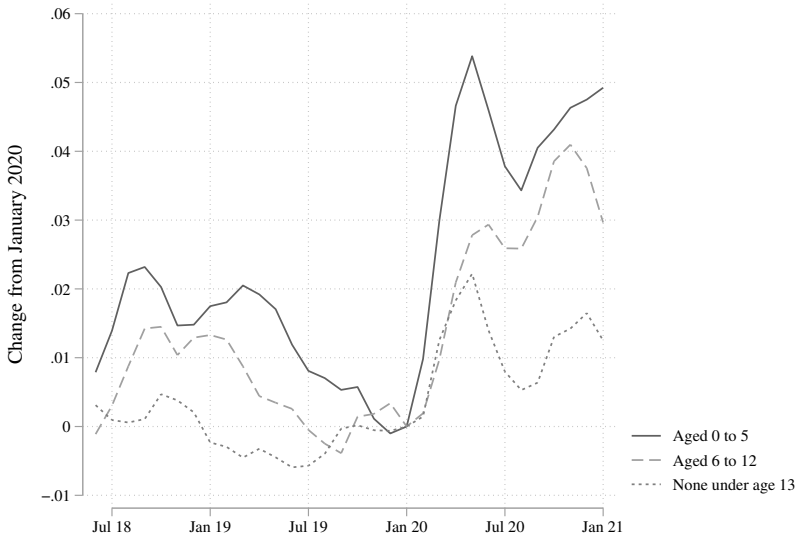
[12] See C. Goldin (2022) for further discussion of recent gains in participation among women with young children.

in childcare compared with men.

Pandemic labor force exits also differed by race and ethnicity. Women of color saw larger and more persistent increases in exits relative to White women. Men of color also experienced large increases in exits, but the differences by race and ethnicity narrowed after the summer of 2020. As we show in figure 2, Black women and Latinas, who were working one year prior, saw between a 4 and 5 percentage point increase in their labor force exits compared to between a 1 and 2 percentage point increase for White women.[13] Again we see differences between men and women in pandemic exit changes by race and ethnicity. As shown in appendix figure 2, exit rates for Black and Latino men increased by more than they did for White men but those differences closed substantially after summer of 2020 while the differences for women remained.

The labor force exits that we document 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 & Kim, 2021) and for workers of color (Cortes & Forsythe, 2023; Couch et al., 2020). The patterns of labor force exits by race and ethnicity suggest that employment losses translated into labor force exits for women in general and Black women and Latinas in particular.

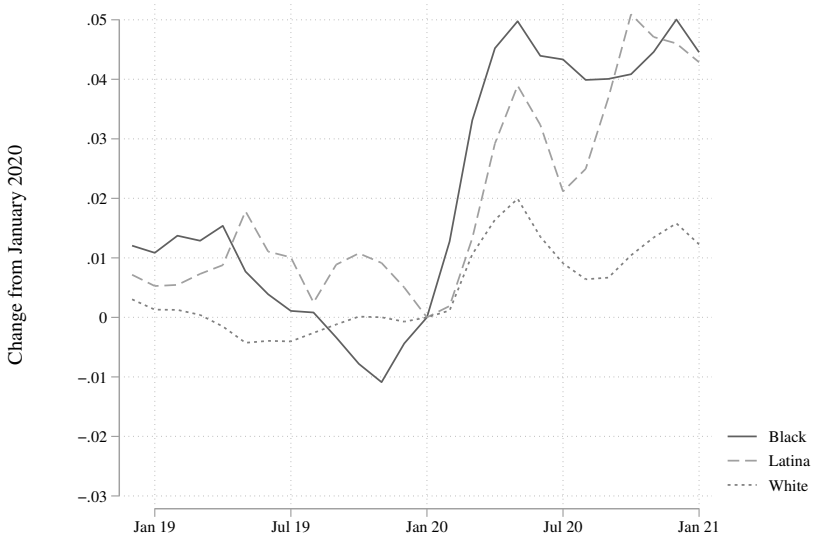
Figure 1: Labor Force Exits, by Presence of Children



Note: Plotted are three-month moving average changes in labor force exits for prime-working-age workers, by the presence of children aged 0 to 5 and 6 to 12 before the pandemic among workers who were employed one year prior. 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).

[13]There were also larger declines in exits in the months before the pandemic among Latinas and Black women than there were among White women. So the pandemic represented a break from these pre-existing trends.

Figure 2: Labor Force Exits, by Race and Ethnicity



Note: Plotted are three-month moving average changes in labor force exits for prime-working-age workers, by race and ethnicity among workers who were employed one year prior. 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).

Explaining Women's Labor Force Exits

In order to understand what drove differences in labor force exits, we conduct two interrelated analyses of women's labor force exits by the presence of children and across racial groups. First, we further examine patterns in women's labor force exits during the pandemic to test if they are most plausibly related to childcare disruptions and increased caregiving responsibilities or other differences between women with and without children. In our preferred specification, we estimate the additional role that these factors played in labor force exits during the pandemic relative to the period immediately before the pandemic. We find evidence that childcare disruptions and general increases in caregiving did lead to additional labor force exits by women with children during the pandemic. Next, we use a modified, non-linear Oaxaca decomposition technique (Fairlie, 2005) to show the extent to which 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. One result from the decomposition analysis is that the additional impacts of children on labor force exits during the pandemic, particularly among low earning women, were the single biggest explanatory factor for the larger increases in labor force exits among Latinas and Black women. However, the increases are still largely unexplained by the covariates we observe.

Empirical Methodology

Our analysis of labor force exits uses linear probability models to predict the likelihood that a woman who was previously employed will have exited the labor force in the previous 12 months. We characterize observations into three categories based on the month of the last interview.[14] First, pandemic observations includes women whose second observation occurred 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. We intentionally exclude the first six months of the pandemic and begin in September 2020 so that the results will not be overly influenced by relatively short duration spells out of the labor force following job losses in March 2020. We end in February 2021 because it is the latest we can measure labor market exits from pre-pandemic jobs using the CPS. The second category of observations we call pre-pandemic, which include those where the woman is last observed between September 2015 and February 2020, again including only women who can be linked to their 12 month prior observation and who were employed in that earlier observation. As a robustness exercise, we also include observations from the Great Recession.[15] Each sample only includes prime-working-age (aged 25 to 54) women.

We first estimate equation 1, which predicts whether or not a woman has exited the labor force measured in year-month t based on characteristics measured at her previous interview in $t-12$. The β_0 coefficients show the impact of our characteristics of interest, Z_{t-12}, on the probability that a woman has exited the labor force conditional on having been working one year before.[16] Our covariates of interest are living with a child aged 0 to 5, living with a child aged 6 to 12, and interactions of living with the two age ranges of children with marital status and weekly earnings again all measured in the $t-12$ month interview.[17] The interactions allow for different effects of children on women's labor force exits based on marital status and earnings. We control for other characteristics in X. These include a cubic for the age of the woman, industry and occupation COVID-19 effects as described in the data section, state and month fixed effects, race and ethnicity indicators, and educational attainment controls. The specification also includes month and state level fixed effects (γ_t and γ_j) to further control for effects that vary across time and geography. We estimate this specification separately for both our pandemic sample and our pre-pandemic sample.

[14] Individuals are only included in the analysis if their observation in month-year t can be linked to the same person 12 months prior in $t-12$.

[15] This includes women whose second observation is observed during the National Bureau of Economic Research dated recession from December 2007 to June 2009. We use the entire period to provide more precision. Results are similar using only the first year when we observe our sample as being employed before the recession's onset.

[16] Because we only observe individuals twice, one year apart, exits are those that have occurred at any point during the previous year and have persisted until the second observation.

[17] We also include the main effects of marital status and weekly earnings both as controls and for ease of interpretation.

$$\text{Exit}_t = Z_{t-12}\beta_0 + X_{t-12}\gamma_0 + \gamma_t + \gamma_j + \varepsilon_1 \tag{1}$$

Next, we estimate effects on labor force exits in excess of historical trends using both the pre-pandemic and the during pandemic samples with equation 2. The specification is an interaction of the single time period specification (equation 1) with an indicator for whether the observation is during the pandemic or not (1_{pandemic}). Our coefficient of interest, β_1, is on the interaction term between the pandemic indicator and our coefficient of interest. Its interpretation is the additional effect of each variable on exits during the pandemic in excess of the variable's effects before the pandemic. Note that the interaction terms apply to the controls as well, so we are controlling for additional impacts of other variables during the pandemic – including varying geographic impacts of the pandemic on labor force participation. We also estimate equation 2 using our pandemic and Great Recession samples to examine whether exits during the pandemic differed from a recession more generally.

$$\begin{aligned}\text{Exit}_t = {} & Z_{t-12}1_{\text{pandemic}}\beta_1 + X_{t-12}1_{\text{pandemic}}\gamma_1 + \gamma_j 1_{\text{pandemic}} \\ & + Z_{t-12}\gamma_2 + X_{t-12}\gamma_3 + \gamma_j + \gamma_t + \varepsilon_2\end{aligned} \tag{2}$$

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.[18] 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.[19] We do this decomposition separately for the pre-pandemic sample and the pandemic sample for comparison.

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

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

[18] The method was introduced by Kitagawa (1955), predating its use in economics.

[19] Fortin et al. (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 et al. (2020).

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 in the data. 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 and lower earnings 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 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 those of our group of interest j, while keeping the distributions of all other covariates fixed. Since the detailed decomposition into categories of explanatory factors (though not the result in terms of overall explanatory power) is sensitive to the order that variables are introduced into the model, we introduced variables in a random order and averaged the effects over 1,000 iterations for each specification.[20] 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 provides information on how exits and covariates differ in our sample across previously employed women with and without children. Around 8 percent of the sample left the labor force

[20]Note that this is the primary reason we prefer this type of decomposition relative to an alternative that sequentially adds covariates to the linear probability model as described in the Appendix.

during the pandemic. Women living with children had higher pandemic era labor force exits than those without, mirroring our earlier figures looking at differences relative to the period before the pandemic. Women living with children are also younger on average, more likely to be married, and have slightly lower earnings than those without children.

There also is substantial overlap between our two categories of women with children. Table 1 shows that around 40 percent of women living with a child aged 0 to 5 also live with a child 6 to 12. Around 30 percent of women living with a child aged 6 to 12 also live with a child under 6. Half of the women in our sample have a Bachelor's degree, around 20 percent live with a child under 6, and nearly 30 percent live with a child between 6 and 12 years of age.

The Role of Children in Women's Labor Force Exits

Main Results

Before the pandemic, living with young children was associated with higher likelihoods of exit among married women and women who earned less as shown in column 1 of table 2. A married woman living with at least one child aged 0 to 5, with average earnings, was 1.9 percentage points more likely to exit the labor force relative to a married woman without children under 13 in the home who also has average earnings. In contrast, the analogous effect for an otherwise identical unmarried woman was to be a statistically insignificant 0.6 percentage points less likely to exit the labor force.

Exits during the pandemic were much more common among women with young children even after controlling for observed characteristics. As shown in column 2 of table 2, the direct effect of having a young child was 4.1 percentage points, meaning that unmarried women with young children were more likely to exit the labor force than those without. Married women with young children also experienced a similar increase in exits during the pandemic relative to married women without children.

Column three of table 2 shows our main finding – women who lived with children under six experienced greater increases in their exit rates during the pandemic relative to observably similar women. Living with a child under age 6 was associated with a 3.5 percentage point increase in excess exits among single women with average earnings relative to similar single women with no children in the household. The effect for married women was very similar at 3.6 percentage points.[21] The estimated effect sizes are quite large relative to the overall 2 percentage point decline in labor force participation during the pandemic. The direct effect of having a child aged 6 to 12, and the interaction between married status and living with a child aged 6 to 12 are statistically

[21]The implied effect for married women is statistically significant at the one percent level. However the difference between married and unmarried women is not statistically detectable.

Table 1: Summary Statistics

	Overall	Age 0 to 5	Age 6 to 12	None Under 13
Labor force exits	0.07	0.11	0.09	0.06
Less than high school	0.05	0.05	0.07	0.04
High school or GED	0.19	0.20	0.21	0.19
Some college	0.26	0.26	0.26	0.26
Bachelor's degree (only)	0.30	0.28	0.27	0.32
More than a bachelor's degree	0.20	0.22	0.18	0.20
Lived with a child aged 0 to 5	0.21	1.00	0.30	0.00
Lived with a child aged 6 to 12	0.29	0.41	1.00	0.00
Was married	0.57	0.71	0.68	0.49
Black	0.13	0.14	0.14	0.13
Latina	0.17	0.19	0.21	0.16
White	0.59	0.57	0.55	0.61
Age	39.75	35.71	39.57	40.82
	(8.54)	(6.25)	(6.52)	(9.42)
Previous weekly wage	988	953	938	1010
	(659)	(668)	(655)	(654)
Occupation employment change	-0.04	-0.03	-0.04	-0.04
	(0.13)	(0.13)	(0.13)	(0.13)
Occupation share working from home	0.36	0.35	0.35	0.36
	(0.23)	(0.23)	(0.23)	(0.23)
Occupation share unable to work due to COVID-19	0.17	0.17	0.17	0.17
	(0.10)	(0.10)	(0.10)	(0.10)
Industry employment change	-0.05	-0.05	-0.05	-0.05
	(0.08)	(0.07)	(0.07)	(0.08)
Industry share working from home	0.37	0.38	0.37	0.37
	(0.17)	(0.16)	(0.17)	(0.17)
Industry share unable to work due to COVID-19	0.17	0.16	0.17	0.17
	(0.09)	(0.08)	(0.08)	(0.09)

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).

Table 2: Effects of Children on Labor Force Exits

Variables	(1) Pre-pandemic	(2) Pandemic	(3) Excess: pandemic and pre-pandemic	(4) Excess: pandemic and Great Recession
Lived with a child aged 0 to 5	0.006	0.041	0.035	0.034
	(0.005)	(0.017)	(0.016)	(0.018)
Lived with a child aged 6 to 12	0.004	0.018	0.015	0.019
	(0.004)	(0.018)	(0.017)	(0.017)
Was married	0.011	0.018	0.006	0.012
	(0.002)	(0.006)	(0.006)	(0.007)
Previous weekly earnings (normalized)	-0.010	-0.010	-0.000	0.006
	(0.001)	(0.005)	(0.004)	(0.005)
Earnings (normalized) by lived with child aged 0 to 5	-0.012	-0.029	-0.017	-0.014
	(0.002)	(0.006)	(0.006)	(0.007)
Earnings (normalized) by lived with child aged 6 to 12	-0.002	-0.018	-0.016	-0.017
	(0.002)	(0.005)	(0.005)	(0.006)
Married by lived with child aged 0 to 5	0.013	0.014	0.002	0.001
	(0.007)	(0.016)	(0.017)	(0.018)
Married by lived with child aged 6 to 12	0.005	-0.009	-0.014	-0.009
	(0.004)	(0.023)	(0.022)	(0.022)
Observations	86,377	8,787	95,164	45,919
Age cubic	X	X	X	X
Race and ethnicity indicators	X	X	X	X
Month fixed effects	X	X	X	X
State fixed effects	X	X	X	X
Industry and occupation controls	X	X	X	X
Education controls	X	X	X	X

Note: The pandemic led to more exits among women with children under six relative to both before the pandemic and the Great Recession. Low-earning women with children 6 to 12 were also more likely to exit during the pandemic. Shown are coefficients from linear probability models predicting labor force exits (columns one and two) and excess exits during the pandemic (β_2 in equation 2) relative to the period before it (column 3) and the Great Recession (column 4). 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. The last two also include women observed from September 2015 to February 2020 (column 3) and December 2007 to June 2009. Standard errors are clustered by month.

insignificant, though potentially economically meaningful.

Our results also suggest that the effect on excess exits of living with a child under the age of 13 were larger for lower-earning women. Specifically, we estimate that a woman with earnings one standard deviation below the pre-pandemic average earnings living with a child had a statistically significant 1.6 or 1.7 percentage point larger increase in labor force exits relative to a woman with the same aged children with average earnings.[22] The effect of the interaction between earnings and the presence of children stands in contrast to the small and statistically insignificant coefficient on the direct effect of weekly earnings. The small direct effect of earnings suggests that the mechanisms go beyond factors that affected all low earning women equally, like more generous governmental benefits. One explanation for the higher rates of exit among lower-earning women with school-aged children is a loss of school as an inexpensive mode of childcare. Additionally rates of homeschooling increased during the pandemic, and homeschooling may have been more difficult to combine with work for lower-income women or women who were unable to work remotely (Musaddiq et al., 2021).

Additionally, we find no evidence that the pandemic increased labor force exits among married women with young children more than it did among unmarried women. If anything, our estimates suggest that the pandemic led to more excess exits among unmarried women than among married women at least for school aged children. 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.[23] However, the negative coefficient on the interaction between being married and living with school-aged children and the zero coefficient on being married and living with children under 5 years old suggests that the pandemic has not resulted in larger increases in labor force exits for married women with kids relative to unmarried women.

Our result that women who live with children had excess exits during the pandemic is also true when we use the Great Recession as our comparison. This provides additional evidence that the effect is due to the pandemic induced increases in childcare responsibilities or loss of childcare access rather than an economic downturn more generally. Column 4 of table 2 shows that the pandemic led to a 3.4 percentage point increase in the likelihood that an unmarried woman, with average earnings, living with children under six would exit the labor force. The interaction terms of living with a child and earnings in column four are also of similar magnitude to column three. The takeaway is that the results are not driven by the comparison with the relatively strong labor market before the pandemic's onset, since they also apply when we compute excess exits relative to a recession.

[22] This includes the direct effect of lower earnings as well.

[23] Alon et al. (2020) and C. D. Goldin (2020) mention this hypothesis.

Beyond variables related to children we find that other factors were not very predictive of additional exits during the pandemic. Appendix table 1 shows that exits were more common for women with less education both before and during the pandemic. Excess exits during the pandemic were also monotonically decreasing by educational attainment, though point estimates are often not statistically different from zero. The direct effect of earnings on excess exits is small in magnitude and statistically indistinguishable from zero.

After controlling for education and earnings, we find that occupation and industry measures of the impact of COVID-19 play only a minor role in predicting excess labor force exits. We find small and statistically insignificant associations with the industry and occupational impacts of COVID-19, which suggests that occupation- or industry-specific human capital and adjustment frictions explain little of the increase in women's pandemic labor force exits, at least for women with similar educational attainment and previous earnings. Interestingly, the occupations where our constructed pandemic-era employment disruptions were largest also were the occupations with higher pre-pandemic rates of exit (column 1 of appendix table 1). Women who worked in industries and occupations that had higher shares of workers working form home during the pandemic were less likely to leave the labor force even before the pandemic in our specification.[24]

Our findings are based on the presence of children in the home, but we interpret the effects as arising from disruptions to families' childcare arrangements that increased some women's caregiving responsibilities. The disruptions also likely go beyond formal school and daycare closures since there also were disruptions to informal care networks due to health concerns like grandparents' concerns about exposure from their grandchildren. Interruptions to informal care could have been particularly difficult because of the unreliability of formal childcare and the possibility that changing work arrangements could lead to temporary gaps in childcare that would be easier to fill informally.[25]

Another piece of evidence that caring for children led to labor force exits during the pandemic is a rise in the share of women who left the labor force and said that they are out of the labor force for caregiving reasons. As shown in appendix figure 3, women living with children had larger increases in the share of exits associated with caregiving during the pandemic. The share of women living with kids under age 13 who said they exited the labor force because of caregiving responsibilities increased by between 3 and 4 percentage points during the pandemic compared to less than one percentage point for women without children in the household.

[24] Of course, it is also possible that occupation and industry are measured with error in the CPS.

[25] Another factor could be concerns about children's exposure to COVID-19 in childcare settings.

Robustness and Alternative Specifications

In this section, we first examine how our modeling assumptions affect our estimates, and second test some alternative ways of approaching our research question.

Across a number of specifications, we find that the effects of children on labor force exits are qualitatively robust. Column one of table 3 shows our baseline estimates. In column two, we estimate a sparse model that includes only indicators for the presence of children. Without any controls, having a preschool aged child increased labor force exits by 3 percentage points while having a school aged child increased them by 1.7 percentage points. In column three, we add the demographic individual level controls and find that the effect of school aged children on excess exits declines. In column four, we add the interactions between having children and earnings and marital status in addition to the earnings control. The estimate for living with a school aged child changes appreciably from column three to column four, highlighting the heterogeneity in the effect of children on women with different marital status and earnings. Columns four and one look nearly identical suggesting the limited role state, time, and occupation or industry controls play. In column five, we add month-year fixed effects, and state by pandemic fixed effects with little change to our estimates. In column six, we run our baseline regression without weights and the magnitude of our estimates decline although they remain consistent in sign. Finally in column seven, we control for the number of children under age 13 in the household. Excess exits increase as the number of children increases. The direct effect of having children in each age group is slightly smaller, as some of the effect for each age group is taken into account in the number of children coefficient. However, the overall results are qualitatively similar to the baseline estimates.

Although we focus on excess exits in our main specification, it would also be of interest to test if women remained employed through the first year of the pandemic. We find similar if not slightly stronger results if we focus on employment as the outcome rather than participation. This implies that the same characteristics that predict leaving the labor force also appear to predict being unemployed, since this specification lumps being out of the labor force with being unemployed.[26]

Another interesting extension is to see if similar patterns apply to women who were not employed one year previously. So in column nine we include all women and we consequently drop the controls for characteristics of women's previous jobs. The specification includes both entry and exit effects because women who were not employed could decide to participate.[27] The esti-

[26]One reason this is not our preferred specification is because the misclassification of employed workers who were unable to work during the pandemic as being unemployed on temporary layoff would affect these results, unlike our main specification for labor force exits. The effects of this phenomenon, however, are likely to be somewhat modest because our sample period begins sufficiently late that it excludes the early months of the pandemic when this issue was the most acute.

[27]Note that some of the women who were not employed were already in the labor force, since they were unemployed.

mates are qualitatively similar, but larger in magnitude suggesting that declines in entry operated similarly to increases in exits although some of the increase may be due to the lack of interaction terms in our main specification.[28]

Next, we test different ways of measuring our covariates of interest in our main specification that estimates excess pandemic exits relative to pre-pandemic years.

While being married can signify a greater degree of resource sharing, we also tried focusing on partnered individuals rather than married individuals. In column two of table 4, we show that our results look very similar if instead of marital status we use the presence of a partner living in the household. Additionally, we tried using education level as a proxy for earning potential rather than using earnings directly in column 3. We see these results as qualitatively similar, although the evidence for less-educated workers with children having greater increases in labor force exits is not as strong as for lower-earning women in our baseline specification. While both education and earnings are a function of previous decisions the women have made, educational attainment is a coarser measure. In our main specification, we control for education and focus on previous earnings, which allows for women of the same education level to have different earnings based on unobserved characteristics and different employment choices.

In column four, we use the same specification, with education interaction terms rather than earnings, to predict non-participation where we do not impose the sample restriction that the women had to be employed 12 months prior. As in table 3, we see that the effects are larger in magnitude suggesting that declines in entry may have affected the same groups that saw increases in labor force exits.

Finally, we run our baseline specification using a logit model rather than a linear probability model. As shown in appendix table 2, the results remain qualitatively similar with the exception that the difference in excess exits based on previous earnings for women living with children under age six becomes smaller and statistically insignificant.

Overall our estimated effects of children on excess exits of previously employed women during the pandemic are qualitatively robust to alternative measures and specifications. When we expand the sample to include women who were not working one-year prior, the results are similar suggesting that the effect of children on labor force exits may have been similar to their effect on decreasing labor force entry as well.

[28] Including movements from unemployment to nonparticipation may also strengthen this effect.

Table 3: Robustness of Effects of Children on Labor Force Exits

Variables	(1) Excess exits: Baseline	(2) Excess exits	(3) Excess exits	(4) Excess exits	(5) Excess exits	(6) Excess exits	(7) Excess exits	(8) Excess non-employment	(9) Excess non-participation
Lived with a child aged 0 to 5	0.035	0.030	0.033	0.035	0.034	0.021	0.028	0.047	0.059
	(0.016)	(0.009)	(0.006)	(0.017)	(0.017)	(0.010)	(0.017)	(0.020)	(0.012)
Lived with a child aged 6 to 12	0.015	0.017	0.005	0.016	0.013	0.011	0.007	0.028	0.018
	(0.017)	(0.007)	(0.008)	(0.017)	(0.017)	(0.012)	(0.019)	(0.020)	(0.017)
Was married	0.006		0.003	0.007	0.005	0.006	0.006	0.013	0.010
	(0.006)		(0.006)	(0.007)	(0.007)	(0.006)	(0.006)	(0.006)	(0.009)
Previous weekly earnings (normalized)	-0.000			-0.000	-0.001	-0.003	-0.000	-0.006	
	(0.004)			(0.003)	(0.003)	(0.004)	(0.004)	(0.003)	
Earnings (normalized) by lived with child aged 0 to 5	-0.017			-0.016	-0.016	-0.013	-0.016	-0.009	
	(0.006)			(0.006)	(0.006)	(0.004)	(0.006)	(0.006)	
Earnings (normalized) by lived with child aged 6 to 12	-0.016			-0.015	-0.016	-0.013	-0.016	-0.022	
	(0.005)			(0.005)	(0.005)	(0.005)	(0.006)	(0.007)	
Married by lived with child aged 0 to 5	0.002			0.002	0.003	0.011	0.001	-0.025	-0.045
	(0.017)			(0.017)	(0.017)	(0.012)	(0.016)	(0.023)	(0.013)
Married by lived with child aged 6 to 12	-0.014			-0.016	-0.013	-0.009	-0.014	-0.014	-0.006
	(0.022)			(0.023)	(0.022)	(0.018)	(0.022)	(0.025)	(0.020)
Number of children aged 0 to 12							0.006		
							(0.004)		
Observations	95,164	103,283	95,210	95,210	95,210	95,164	95,164	95,164	140,636
Direct effects - not shown	X	X	X	X	X	X	X	X	X
Weights	X	X	X	X	X		X	X	X
Race and ethnicity	X		X	X	X	X	X	X	X
Age and education	X		X	X	X	X	X	X	X
Month by year indictors	X				X	X	X	X	X
State indicators separately pre and post	X				X	X	X	X	X
Occupation and industry effects	X					X	X	X	
Employment 12 months ago									X

Note: The effect of having children under six and of having children between 6 and 12 among women with lower earnings is apparent across specifications. Columns 1 through 7 predict labor force exits among our sample of previously employed women. Sample sizes change across specifications due to missing data. Column 1 is our baseline specification. Column 2 includes only the main effects of having child in the home with no individual level controls. Column 3 includes race and ethnicity, marital status, earnings, age, and education controls, but no interactions with the presence of children. Column 4 adds the interaction terms. Column 5 adds month by year indicators and state indicators. Column 6 is an unweighted version of the base specification, Column 7 includes a control for the number of children under the age of 13 living in the household. Column 8 is a regression predicting non-employment as opposed to labor force exit. Column 9 is a specification including women who were working a year earlier. Each is a variation of the main specification in column three of Table 2 presenting β_2 terms in equation 2). Standard errors are clustered for each month. See the notes in Table 2 for more details "Direct effects" refer to the non-interacted terms while "Employment 12 months ago" refers to the inclusion of a control for employment status.

Aggregate effects

In addition to the direct impacts on women and their careers, labor force exits due to childcare interruptions could have contributed to lower levels of aggregate labor force participation during our sample period. 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 during the Fall of 2020. 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. Despite the strong assumptions, the exercise still provides a useful means of understanding the size of our estimated effects.

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 1.5 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

In this section, we use an Oaxaca-Blinder-Fairlie (Fairlie, 2005) decomposition to quantify the effects of pandemic induced changes on disparities in labor force exit rates for Latinas and Black women relative to White women. An Oaxaca-Blinder-Fairlie decomposition is valuable in this context for two reasons. First, it allows us to perform a detailed decomposition, as described in Fortin et al. (2011), that shows the effects of specific variables on the level of exits women of different races experienced during the pandemic.[29] Second, Oaxaca-Blinder-Fairlie decompositions have been commonly used to study racial and gender gaps in employment outcomes, including

[29] An alternative approach, which we present in Appendix Table 5, is to sequentially add covariates to our linear specification and examine how the coefficients on race and ethnicity change. Sequentially adding coefficients does not allow us to perform this detailed decomposition where we can attribute differences to specific variables, since the results are sensitive to the order variables are introduced.

Table 4: Effects of Children on Labor Force Exits

Variables	(1) Baseline: Excess exits	(2) Excess exits	(3) Excess exits	(4) Excess non-participation
Lived with a child aged 0 to 5	0.035	0.037	0.037	0.057
	(0.016)	(0.022)	(0.019)	(0.013)
Lived with a child aged 6 to 12	0.015	0.018	0.023	0.021
	(0.017)	(0.016)	(0.017)	(0.018)
Was married	0.006		0.007	0.010
	(0.006)		(0.005)	(0.008)
Married by lived with child aged 0 to 5	0.002		-0.008	-0.046
	(0.017)		(0.011)	(0.015)
Married by lived with child aged 6 to 12	-0.014		-0.010	-0.005
	(0.022)		(0.017)	(0.021)
Previous weekly earnings (normalized)	-0.000	-0.000		
	(0.004)	(0.004)		
Earnings (normalized) by lived with child aged 0 to 5	-0.017	-0.016		
	(0.006)	(0.006)		
Earnings (normalized) by lived with child aged 6 to 12	-0.016	-0.016		
	(0.005)	(0.005)		
Had partner		0.008		
		(0.007)		
Had partner by lived with child aged 0 to 5		-0.001		
		(0.024)		
Had partner by lived with child aged 6 to 12		-0.017		
		(0.022)		
Bachelor's degree or more			-0.009	-0.012
			(0.005)	(0.007)
Bachelor's or more by lived with child aged 0 to 5			-0.002	0.002
			(0.013)	(0.012)
Bachelor's or more by lived with child aged 6 to 12			-0.011	-0.006
			(0.008)	(0.008)
Observations	95,164	95,164	103,234	140,636
Weights	X	X	X	X
Race and ethnicity	X	X	X	X
Direct effects - not shown	X	X	X	X
Month by year indictors	X	X	X	X
State indicators separately pre and post	X	X	X	X
Occupation and industry effects	X	X	X	
Age cubic term	X	X	X	X
Education controls	X	X		
Employed 12 months prior				X
Includes previously non-employed				X

Note: The effects of having children under six and of having children 6 to 12 among women with lower earnings are similar when separating out by having a partner (including unmarried partners and those of any gender) and of having a Bachelor's degree or more as opposed to having low earnings. Results are also similar in looking at non-participation, including women who were not employed a year earlier. Presented are estimated effects of each variable on excess labor market exits during the pandemic (β_2 in equation 2) alongside standard errors clustered by each month. Other aspects follow Table 2.

during the pandemic, so they increase the comparability of our results.[30]

As shown in figures 3 and 4, a sizeable share of the racial gaps in labor force exits remain unexplained both before and especially during the pandemic. While it's difficult to attribute the unexplained portion to factors outside of our analysis, other unobserved differences across racial groups, differences in how observed characteristics affect labor force participation, and discrimination all may contribute. Before the pandemic, covariates explained three-quarters of the gap between Latinas and White women's exit patterns. This share fell to a little over half of Latinas' six percentage point gap in labor force exits during the pandemic. For Black women, covariates explain roughly one third of their higher likelihood of exit compared to White women both during the pandemic and before.[31]

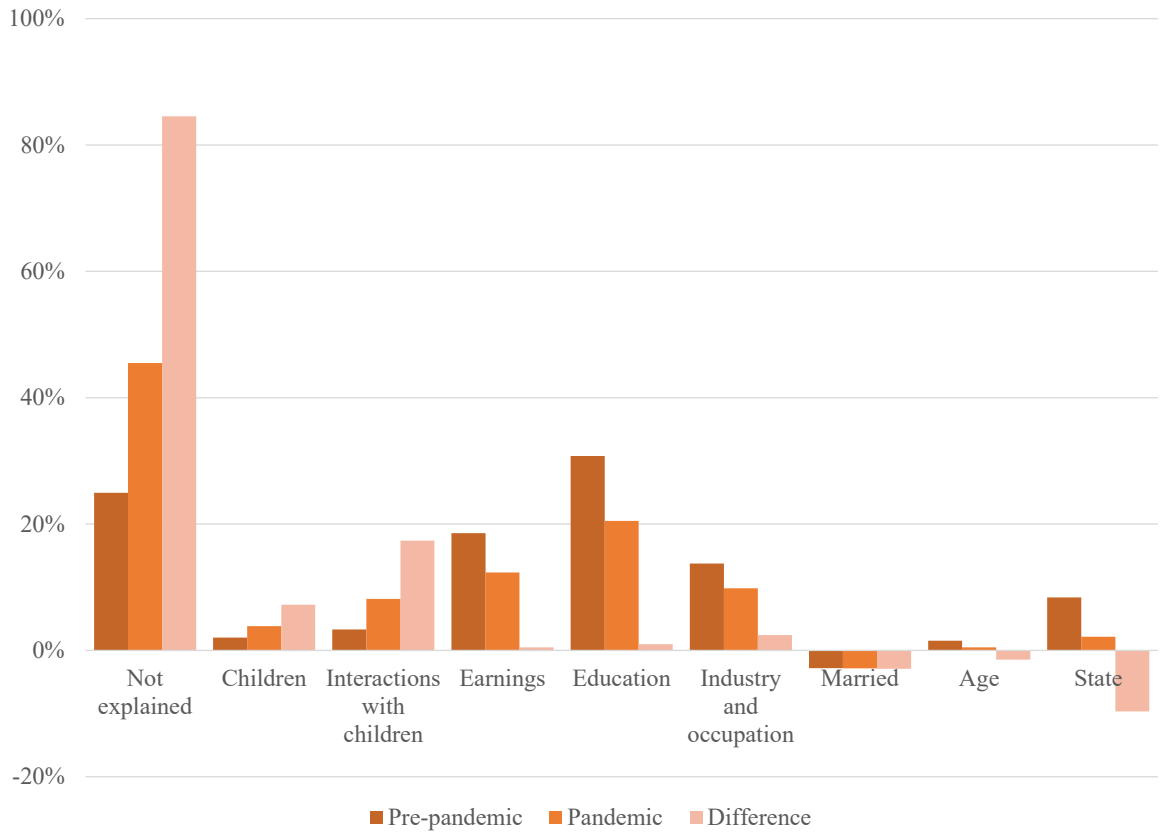
Education, industries, occupations, and earnings describe the largest proportion of the cross sectional differences in exits among women of color relative to White women both during and before the pandemic. Together they account for 80 percent of the explained differences for Latinas and around 100 percent of explained differences for Black women. As we show in appendix table 3, Latinas and Black women were more likely to be employed in occupations and industries that were adversely effected by COVID-19. Additionally Latinas and Black women had less education on average and lower earnings relative to White women. Differences in marital status between Black women and White women actually suggest that Black women should have lower rates of labor force exit before and during the pandemic.

Looking at the differences in contributions during the pandemic relative to the years before, the biggest changes relate to the interaction terms between marital status, earnings, and the presence of children shown under "Interactions with children". Importantly, the effect of these characteristics during the pandemic was to increase exits for women of color relative to White women. Prior to the pandemic they were associated with lower levels of exit for Black women and very slightly higher rates of exit for Latinas. Black women in our sample were less likely to be married than White women, and prior to the pandemic, married women with children were more likely to exit the labor force. Additionally, women who earned less and lived with children had increases in their excess exits, and Latinas and Black women earned less on average relative to White women. Finally children were associated with larger increases in exits during the pandemic and Latinas and Black women are over-represented among women with children relative to their shares in the overall population. Latinas make up 19 percent of women with children under 6 and 21 percent

[30]For example, Zafar (2013) used the technique to study gender differences in college major choice, (Couch et al., 2022) study gender gaps during COVID-19, and Couch et al. (2020) study gaps by race in the first months of the pandemic, before our analysis.

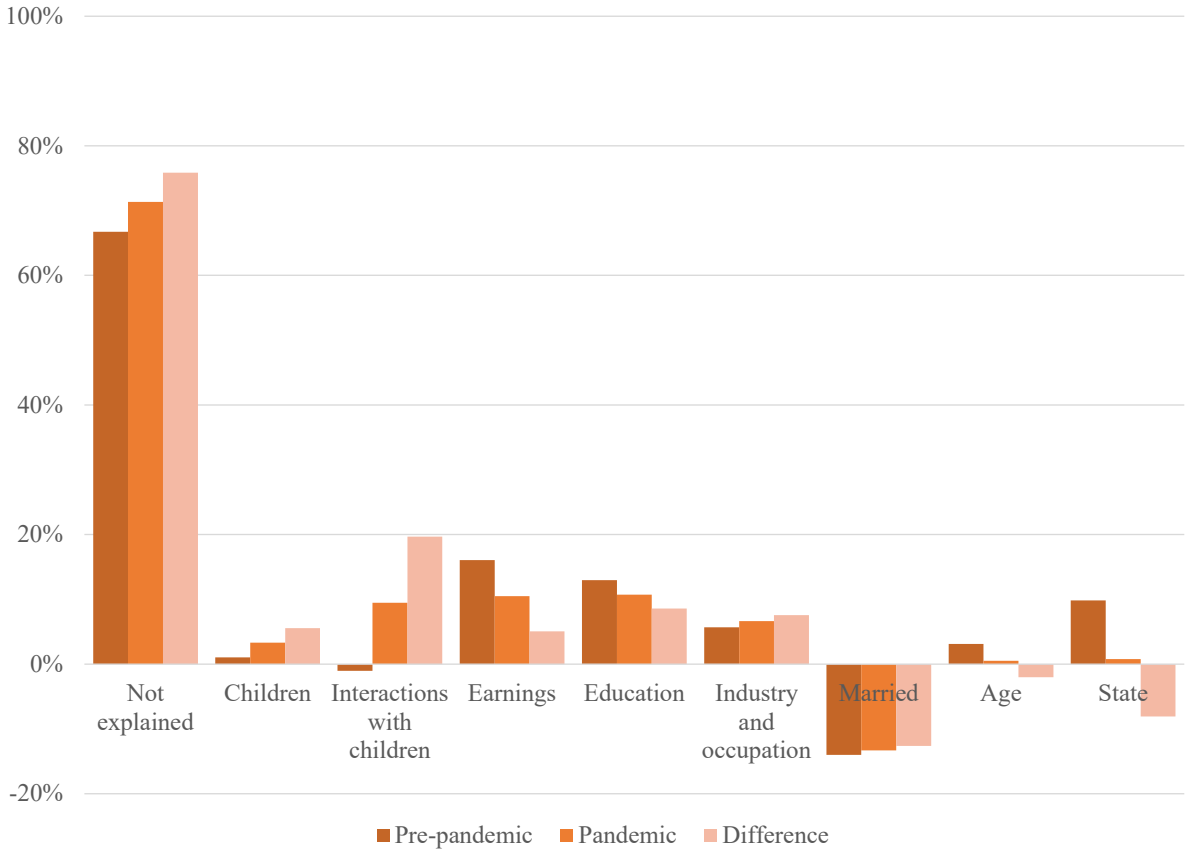
[31]In an effort to better understand the unexplained portion, we augment our baseline specification to allow the effect of children to differ by race and ethnicity, but the results are imprecise. However the point estimates are large, and we cannot rule out large differences in the effects of children by race. See Appendix Table 6.

Figure 3: Decomposing the Latina-White Exit Gap



Note: Observed covariates explained a smaller share of the of the higher rate of labor force exits among Latinas relative to White women during the pandemic relative to before. Additionally, the presence of children and interactions of earnings and marital status with the presence of children were more explanatory during the pandemic, leading to essentially all of the increases during the pandemic that are predicted by variables. Initial earnings, education, industry, and occupation however are the most explanatory in both periods. Shown is the proportion of differences in exits by Latinas relative to White women that are not explained by variables and explained by the specified categories of variables according to the decomposition. Shades represent the pre-pandemic decomposition, the pandemic period decomposition, and the differences (in levels) between pre-pandemic and pandemic period decompositions.

Figure 4: Decomposing the Black-White Exit Gap



Note: Observed covariates explained a smaller share of the of the higher rate of labor force exits among Black women relative to White women during the pandemic relative to before. Additionally, the presence of children and interactions of earnings and marital status with the presence of children were more explanatory during the pandemic, leading to essentially all of the increases during the pandemic that are predicted by variables. Initial earnings, education, industry, and occupation however are very explanatory in both periods. Shown is the proportion of differences in exits by Black women relative to White women that are not explained by variables and explained by the specified categories of variables according to the decomposition. Shades represent the pre-pandemic decomposition, the pandemic period decomposition, and the differences (in levels) between pre-pandemic and pandemic period decompositions.

of women with children 6 to 12 despite making up only 17 percent of the overall population of women. Black women make up 14 percent of both categories of women with children compared with 13 percent of the population. Notably, the explanatory value of the state of residence falls during the pandemic and can no longer appreciably explain racial differences in exit rates. This may contribute to the overall increase in the share that is unexplained during the pandemic.

The presence of children and their interaction with earnings and marital status stand out as the largest contributors to the explained portion of the increase in exits during the pandemic relative to pre-pandemic levels for women of color relative to White women. These results suggest that the childcare disruptions during the pandemic were either larger for women of color or they were less able to navigate them while remaining employed.

The decompositions suggest that the higher rates of exit of women living with young children and with relatively low earnings 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 Latinas and Black women's higher rates of labor force exits both before and during the pandemic.

Conclusion

This paper shows that the COVID pandemic led to larger increases in labor force exits among women living with children and women of color through its first year. Women living with children under age 6, particularly single women, were more likely to exit the labor force during the pandemic than in previous years. The pandemic also had detectably larger effects on women who both worked at low-earning jobs and were living with children before the pandemic. Finally, increases in exits among women with children contributed to the larger increases in labor force exits among Latina and Black women during the pandemic.

Examining variation in labor force exits between different groups of women provides a valuable lens for understanding the pandemic and the importance of formal and informal care more broadly. Our results suggest that earlier patterns of labor market outcomes by race, ethnicity, education, and pre-pandemic income extended through later periods of the pandemic.[32] However, our finding that increases in labor force exits were larger for women with children stands in contrast to the emphasis that earlier studies placed on occupation and industry level differences. Our finding of larger increases in exits among women with children compared to similar women without children also suggests that the exits were not solely attributable to the effect of government support programs

[32]Earlier studies include Couch et al. (2020), Holder et al. (2021), and Cortes and Forsythe (2023).

provided to all women, like expanded unemployment insurance and stimulus payments.[33] It is also possible, however, that the effects of children on labor force exits would be smaller in an environment with fewer financial supports for women outside of the labor force, particularly for unmarried women.

Our results highlight the importance of formal and informal childcare for women's labor force participation, and particularly for lower-earning women and women of color. The wide ranging disruptions to childcare caused by the COVID-19 pandemic went beyond the cost shocks to formal childcare explored in some previous work (Morrissey, 2017). So the coincident increase in labor force exits among women living with children provides additional, plausibly causal evidence of the wider role that care and unpaid work plays in the economy (Compton & Pollak, 2014; Himmelweit, 2002). The characteristics of the women who experienced excess exits during the pandemic also 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 lower-earning women (Morrissey, 2017).

Our results are also important for policymakers trying to develop measures to increase labor force participation and address economic disparities. 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. Women's pandemic-era experiences highlight the importance of childcare institutions in supporting employment for all women, but particularly for lower earning women and women of color.

References

Albanesi, S., & Kim, J. (2021). Effects of the covid-19 recession on the us labor market: Occupation, family, and gender. *Journal of Economic Perspectives*, *35*(3), 3–24. https://doi.org/10.1257/jep.35.3.3

Alon, T., Doepke, M., Olmstead-Rumsey, J., & Tertilt, M. (2020). *The impact of covid-19 on gender equality* (Working Paper No. 26947). National Bureau of Economic Research. https://doi.org/10.3386/w26947

Augustine, J. M., & Prickett, K. (2022). Gender Disparities in Increased Parenting Time During the COVID-19 Pandemic: A Research Note. *Demography*, *59*(4), 1233–1247. https://doi.org/10.1215/00703370-10113125

Blau, F. D., & Kahn, L. M. (2017). The gender wage gap: Extent, trends, and explanations. *Journal of Economic Literature*, *55*(3), 789–865. https://doi.org/10.1257/jel.20160995

Compton, J., & Pollak, R. (2014). Family proximity, childcare, and women's labor force attachment. *Journal of Urban Economics*, *79*(100), 72–90. https://doi.org/10.1016/j.jue.2013.03.007

[33] It is also possible that women with children were more responsive to changes in those programs.

Cortes, G. M., & Forsythe, E. (2023). Heterogeneous labor market impacts of the covid-19 pandemic. *ILR Review*, *76*(1), 30–55. https://doi.org/10.1177/00197939221076856

Costoya, V., Echeverría, L., Edo, M., Rocha, A., & Thailinger, A. (2022). Gender gaps within couples: Evidence of time re-allocations during covid-19 in argentina. *Journal of Family and Economic Issues*, *43*, 213–226. https://doi.org/10.1007/s10834-021-09770-8

Couch, K. A., Fairlie, R. W., & Xu, H. (2020). Early evidence of the impacts of covid-19 on minority unemployment. *Journal of Public Economics*, *192*. https://doi.org/10.1016/j.jpubeco.2020.104287

Couch, K. A., Fairlie, R. W., & Xu, H. (2022). The evolving impacts of the covid-19 pandemic on gender inequality in the us labor market: The covid motherhood penalty. *Economic Inquiry*, *60*(2), 485–507. https://doi.org/10.1111/ecin.13054

Fairlie, R. W. (2005). An extension of the blinder-oaxaca decomposition technique to logit and probit models. *Journal of economic and social measurement*, *30*(4), 305–316.

Flood, S., King, M., Rodgers, R., Ruggles, S., & Warren, J. R. (2020). Integrated public use microdata series, current population survey: Version 7.0. https://doi.org/10.18128/D030.V7.0

Fortin, N., Lemieux, T., & Firpo, S. (2011). Chapter 1 - decomposition methods in economics. In O. Ashenfelter & D. Card (Eds.), *Handbook of labor economics* (pp. 1–102). Elsevier. https://doi.org/10.1016/S0169-7218(11)00407-2

Furman, J., Kearney, M., & Powell III, W. (2021). How much have childcare challenges slowed the us jobs market recovery? https://www.piie.com/blogs/realtime-economic-issues-watch/how-much-have-childcare-challenges-slowed-us-jobs-market

Garcia, K. S., & Cowan, B. (2022). *The impact of school and childcare closures on labor market outcomes during the covid-19 pandemic* (Working Paper No. 29641). National Bureau of Economic Research. https://doi.org/10.3386/w29641

Goldin, C. (2022). Understanding the Economic Impact of COVID-19 on Women. *Brookings Papers on Economic Activity*, *2022*(1), 65–139. https://doi.org/10.1353/eca.2022.0019

Goldin, C. D. (2020). Journey across a century of women. *NBER Reporter*, *2020*(3), 1–7. https://www.nber.org/reporter/2020number3/journey-across-century-women

Hansen, B., Sabia, J., & Schaller, J. (2022). *Schools, job flexibility, and married women's labor supply* (Working Paper No. 29660). National Bureau of Economic Research. https://doi.org/10.3386/w29660

Heggeness, M. L. (2020). Estimating the immediate impact of the covid-19 shock on parental attachment to the labor market and the double bind of mothers. *Review of Economics of the Household*, *18*(4), 1053–1078. https://doi.org/10.1007/s11150-020-09514-x

Himmelweit, S. (2002). Making visible the hidden economy: The case for gender-impact analysis of economic policy. *Feminist Economics*, *8*(1), 49–70. https://doi.org/10.1080/13545700110104864

Holder, M., Jones, J., & Masterson, T. (2021). The early impact of covid-19 on job losses among black women in the united states. *Feminist Economics*, *27*(1-2), 103–116. https://doi.org/10.1080/13545701.2020.1849766

Kitagawa, E. (1955). Components of a difference between two rates. *Journal of the American Statistical Association*, *50*(272), 1168–1194. https://doi.org/10.2307/2281213

Krolikowski, P., Zabek, M., & Coate, P. (2020). Parental proximity and earnings after job displacements. *Labour Economics*, *65*(100). https://doi.org/10.1016/j.labeco.2020.101

Leigh, I., Montes, J., & Smith, C. (2021). *Caregiving and covid-19* (tech. rep.). Board of Governors of the Federal Reserve System. https://doi.org/10.17016/2380-7172.2984

Luengo-Prado, M. J. (2021). *Covid-19 and the labor market outcomes for prime-aged women* (Current Policy Perspectives Working Paper). Federal Reserve Bank of Boston. https://EconPapers.repec.org/RePEc:fip:fedbcq:90899

Morrissey, T. W. (2017). Child care and parent labor force participation: A review of the research literature. *Review of Economics of the Household*, *15*(1), 1–24. https://doi.org/10.1007/s11150-016-9331-3

Musaddiq, T., Stange, K., Bacher-Hicks, A., & Goodman, J. (2021). The Pandemic's effect on demand for public schools, homeschooling, and private schools. *NBER Working Paper 29262*.

Oaxaca, R. L., & Ransom, M. R. (1994). On discrimination and the decomposition of wage differentials. *Journal of Econometrics*, *61*(1), 5–21. https://doi.org/10.1016/0304-4076(94)90074-4

Pitts, M. M. (2021). *Where are they now? workers with young children during covid-19* (Policy Hub Working Paper No. 2021-10). Federal Reserve Bank of Atlanta. https://doi.org/10.29338/ph2021-10

Ponthieux, S., & Meurs, D. (2015). Gender inequality. *Handbook of income distribution* (pp. 981–1146). Elsevier. https://doi.org/10.1016/B978-0-444-59428-0.00013-8

Russell, L., & Sun, C. (2020). The effect of mandatory child care center closures on women's labor market outcomes during the covid-19 pandemic. *Covid Economics, Vetted and Real-Time Papers*, *62*(18), 124–54. https://cepr.org/system/files/publication-files/101414-covid_economics_issue_62.pdf#page=129

Zafar, B. (2013). College major choice and the gender gap. *Journal of Human Resources*, *48*(3), 545–595. https://doi.org/10.3368/jhr.48.3.545

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

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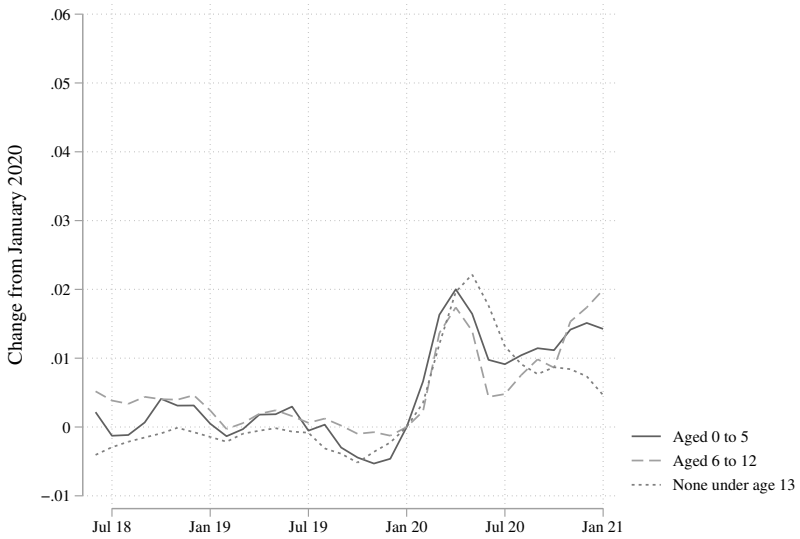
Trends in Exits Among Men

In order to compare the trends we see across women to pandemic patterns among men, we show labor force exits among previously employed men broken out by the presence of children in the household in appendix figure 1 and by race and ethnicity in appendix gigure 2.

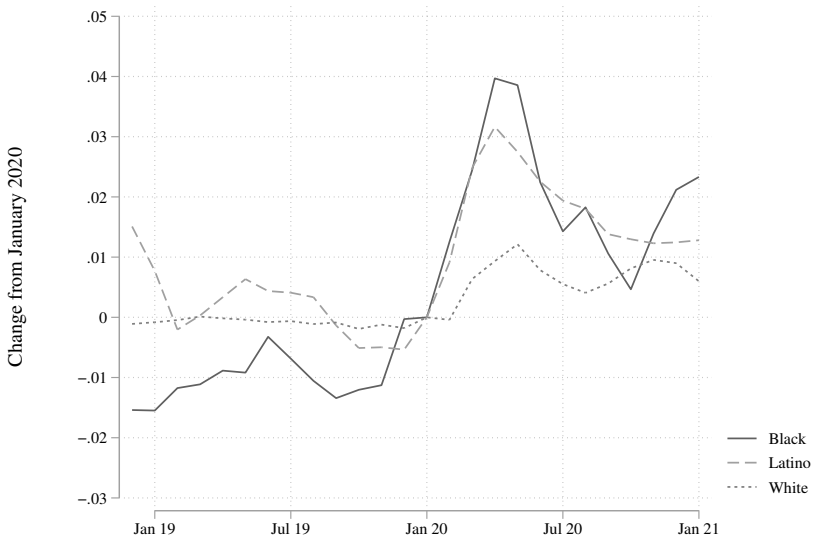
Figure 1: Male Labor Force Exits, by Presence of Children



Note: Plotted are three-month moving average changes in labor force exits for prime-working-age workers, by the presence of children aged 0 to 5 and 6 to 12 before the pandemic among workers who were employed one year prior. 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).

These figures show that differences in exit rates between men with children and those without are much smaller than the differences for women. Men of color had larger exit rates during the pan-

Figure 2: Male Labor Force Exits, by Race and Ethnicity



Note: Plotted are three-month moving average changes in labor force exits for prime-working-age workers, by race and ethnicity among workers who were employed one year prior. 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).

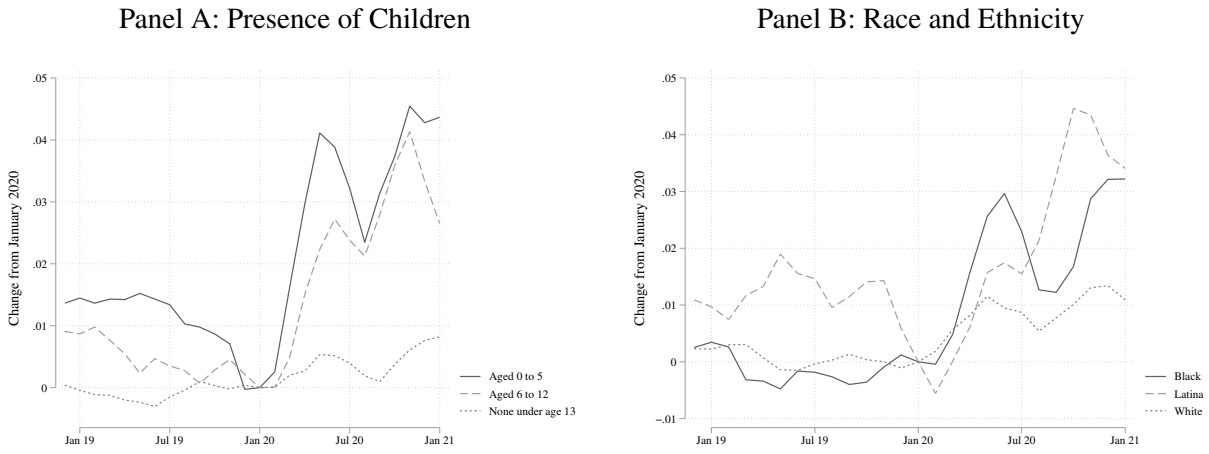
demic relative to White men, but the differences decreased later in the pandemic. This convergence did not occur for women.

Women Outside the Labor Force: Caregiving Trends

The labor force patterns for women described in the paper are mirrored by increases in the share of women not in the labor force stating that caregiving is their primary reason for non-participation. In particular, we find that there were large increases in the share of women who were living with children who exited the labor force and continued to be out of the labor force because of caregiving, as shown in panel A of appendix figure 3. Women who were living with children under age 6 saw a roughly four percentage point increase that persisted through early 2021. Women who were living with children aged 6 to 12 saw a highly persistent jump of around three percentage points. While it is reassuring that the largest jumps are among women with children, the graph also shows a slight increase of around half a percentage point for other women. This could reflect additional caregiving responsibilities, for example for elderly relatives.[1]

Latinas and Black women also had larger increases in the share of exits that women report as being due to caregiving. Panel B of figure 3 shows a roughly two percentage point increase in the share of Latinas and Black women who exited the labor force and said that they were not in the labor force because of caregiving reasons. The two percentage point increases among these women of color was roughly double the one percentage point increase among White women. This pattern provides additional support for our main finding that the burden of caregiving affected women of color more than it did White women, at least in terms of women's ability to remain in the labor force.

Figure 3: Previously Employed Women Not in the Labor Force: Caregiving Reasons



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 who were employed 12 months ago by the presence of children aged 0 to 5 and aged 6 to 12 before the pandemic and 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).

[1]The plot uses a question asked in the Current Population Survey (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."

Additional Results

In this section, we report additional results from our main specifications in table 2 and the marginal effects from a logit specification rather than a linear probability model.

Full results of baseline specification

As briefly discussed in the main text, labor force exits decline as educational attainment increases both before and during the pandemic. Excess pandemic exits exhibit the same pattern both when compared with pre-pandemic exits and Great Recession exits although many of the point estimates are not statistically different from zero. Generally the occupation and industry measures are not predictive of excess exits. They would likely be predictive of employment losses in the initial months of the pandemic, but these results suggest that occupation and industry COVID-19 effects didn't drive excess exits as measured in September 2020 to February 2021. Interestingly, occupations that were hard hit by employment losses during the pandemic had greater base levels of exits during the years prior to the pandemic while occupations and industries that used more working from home had fewer exits. These correlations likely reflect existing differences above and beyond women's education and earnings in the occupations and industries that were affected by COVID-19.

Age does not appear to be predictive of excess exits, but it was predictive of pre-pandemic exits. Latinas and Black women were more likely than White women to exit the labor force both before and during the pandemic, but when we compare their excess exits we see positive but statistically insignificant effects after controlling for many observable covariates.

Results from logit specification

An alternative specification would be to use a non-linear logit model to predict labor force exits. We show the marginal effects at the mean of each variable in table 2. The estimates are qualitatively similar to those from the linear probability model. Women with small children were more likely to leave the labor force during the pandemic than observably similar women without children. The wage gradient for women with older children remains while the wage gradient for women with younger children is economically small and statistically insignificant. Women with older children who earned lower wages before the pandemic had larger increases in their exits than women with older children who earned higher wages.

Additional Decomposition Results

Summary statistics

Appendix table 3 shows summary statistics for our sample by race and ethnicity, providing context for the decomposition results.

The first big difference is that Latinas and Black women had higher rates of exits relative to White women during the pandemic. And these larger differences are likely to be expected because Latinas and Black women generally were working in occupations and industries that were harder hit by the pandemic than White women. Latinas and Black women additionally had lower levels of education than White women.

Table 1: Effects of Children on Labor Force Exits: Additional Variables

Variables	(1) Pre-pandemic	(2) Pandemic	(3) Excess: pandemic and pre-pandemic	(4) Excess: pandemic and great recession
Less than High School	0.054	0.077	0.023	0.035
	(0.008)	(0.017)	(0.017)	(0.017)
High School or GED	0.010	0.016	0.006	0.004
	(0.003)	(0.003)	(0.004)	(0.004)
Bachelor's degree (only)	-0.005	-0.007	-0.001	-0.009
	(0.003)	(0.004)	(0.004)	(0.005)
More than a bachelor's degree	-0.007	-0.015	-0.008	-0.016
	(0.003)	(0.003)	(0.004)	(0.005)
Occupation employment change	-0.043	-0.002	0.041	0.013
	(0.010)	(0.044)	(0.042)	(0.045)
Occupation share working from home	-0.014	-0.026	-0.012	-0.026
	(0.004)	(0.021)	(0.019)	(0.020)
Occupation share unable to work due to COVID-19	-0.004	0.059	0.062	0.025
	(0.016)	(0.049)	(0.048)	(0.051)
Industry employment change	0.026	-0.063	-0.089	0.030
	(0.035)	(0.142)	(0.135)	(0.142)
Industry share working from home	-0.017	0.001	0.017	0.006
	(0.007)	(0.028)	(0.027)	(0.028)
Industry share unable to work due to COVID-19	0.044	0.026	-0.018	0.060
	(0.031)	(0.139)	(0.131)	(0.135)
Age (normalized)	-0.187	-0.348	-0.162	-0.432
	(0.068)	(0.396)	(0.369)	(0.391)
Age squared (normalized)	0.284	0.652	0.368	0.899
	(0.135)	(0.796)	(0.743)	(0.787)
Age cubed (normalized)	-0.108	-0.307	-0.199	-0.462
	(0.069)	(0.404)	(0.377)	(0.400)
Latina	0.013	0.024	0.011	0.010
	(0.003)	(0.011)	(0.011)	(0.011)
Black	0.012	0.027	0.015	0.018
	(0.003)	(0.008)	(0.008)	(0.008)
Asian	0.025	0.007	-0.018	-0.001
	(0.004)	(0.013)	(0.013)	(0.014)
Other race/ethnicity	0.010	-0.010	-0.019	-0.014
	(0.006)	(0.022)	(0.021)	(0.022)
Observations	86,377	8,787	95,164	45,919
Household comosition	X	X	X	X
Weekly earnings	X	X	X	X
Interacted household composition and earnings	X	X	X	X
Month fixed effects	X	X	X	X
State fixed effects	X	X	X	X

Note: Differences by industry and occupation played a surprisingly small role in women's excess labor force exits during the pandemic. Table shows additional coefficients that are not shown in Table 2 due to space constraints. See footnotes of Table 2 for more details.

Table 2: Effects of Children on Labor Force Exits; Logit Specification

Variables	(1) Pre-pandemic	(2) Pandemic	(3) Excess: pandemic and pre-pandemic	(4) Excess: pandemic and Great Recession
Lived with a child aged 0 to 5	0.002	0.026	0.020	0.013
	(0.005)	(0.013)	(0.011)	(0.014)
Lived with a child aged 6 to 12	0.003	0.005	0.001	0.008
	(0.004)	(0.017)	(0.014)	(0.014)
Was married	0.012	0.019	0.004	0.010
	(0.002)	(0.005)	(0.005)	(0.007)
Previous weekly earnings (normalized)	-0.019	-0.023	-0.000	0.015
	(0.002)	(0.006)	(0.005)	(0.007)
Earnings (normalized) by lived with child aged 0 to 5	-0.008	-0.015	-0.005	-0.010
	(0.004)	(0.011)	(0.009)	(0.012)
Earnings (normalized) by lived with child aged 6 to 12	0.001	-0.030	-0.026	-0.023
	(0.003)	(0.014)	(0.011)	(0.012)
Married by lived with child aged 0 to 5	0.009	0.009	-0.001	-0.001
	(0.006)	(0.011)	(0.011)	(0.012)
Married by lived with child aged 6 to 12	0.002	-0.013	-0.013	-0.010
	(0.004)	(0.019)	(0.015)	(0.016)
Observations	86,377	8,787	95,164	45,919
Age cubic	X	X	X	X
Race and ethnicity indicators	X	X	X	X
Month fixed effects	X	X	X	X
State fixed effects	X	X	X	X
Industry and occupation controls	X	X	X	X
Education controls	X	X	X	X

Note: Marginal effects from a logit model run on our main baseline specification described in Table 2. See footnotes of Table 2 for more details.

Relevant to our results, we also find differences in fertility, marital status, and pre-pandemic earnings. Latinas were much more likely to have children – particularly small children – than were White women. Black women were also slightly more likely to have children than were White women. Black women were also much less likely to be married than White women or Latinas. Latinas and Black women also earned less per week than White women. Each of these differences points to the channels of how childcare interruptions could differentially affect these groups of women.

Table 3: Summary Statistics by Race and Ethnicity

	Overall	Latina	Black	White
Labor force exits	0.07	0.12	0.10	0.06
Less than high school	0.05	0.15	0.05	0.01
High school or GED	0.19	0.28	0.25	0.16
Some college	0.26	0.25	0.28	0.26
Bachelor's degree (only)	0.30	0.21	0.24	0.33
More than a bachelor's degree	0.20	0.10	0.18	0.23
Lived with a child aged 0 to 5	0.21	0.23	0.22	0.20
Lived with a child aged 6 to 12	0.29	0.35	0.31	0.27
Was married	0.57	0.57	0.57	0.57
Age	39.75	39.06	39.67	40.06
	(8.54)	(8.61)	(8.54)	(8.54)
Previous weekly wage	988	778	879	1042
	(659)	(536)	(592)	(669)
Occupation employment change	-0.04	-0.08	-0.05	-0.03
	(0.13)	(0.14)	(0.14)	(0.12)
Occupation share working from home	0.36	0.29	0.31	0.39
	(0.23)	(0.23)	(0.22)	(0.22)
Occupation share unable to work due to COVID-19	0.17	0.20	0.18	0.16
	(0.10)	(0.12)	(0.11)	(0.09)
Industry employment change	-0.05	-0.07	-0.05	-0.05
	(0.08)	(0.08)	(0.08)	(0.07)
Industry share working from home	0.37	0.33	0.37	0.39
	(0.17)	(0.18)	(0.17)	(0.16)
Industry share unable to work due to COVID-19	0.17	0.18	0.17	0.16
	(0.09)	(0.10)	(0.09)	(0.08)

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).

Full decomposition results as a table

Appendix table 4 shows the results from our Oaxaca style decomposition. Reported in the table are the proportions of the difference in exit rates explained by each group of variables. Columns one though three show the results for the Latina-White gap while columns four through six show the results for the Black-White gap. The Before column explains differences in exit rates prior to the pandemic, the During column is for pandemic era exits, and the Difference column shows the difference in explanatory power for the variables between the two time periods.

Factors relating to employment explain a large share of the differences in exit rates before and during the pandemic for both Latinas and Black women. When we look at the differences between the two time periods we see that the household interactions stand out as being much more important in explaining exits during the pandemic than prior to the pandemic. For Black women their lower rates of marriage actually predict lower exit rates so this covariate actually increases the unexplained portion. A woman's state of residence is predictive of exits before the pandemic but is not predictive during the pandemic. While we include this control for completeness, one could argue that states with higher levels of workers of color may have higher exit rates due to discrimination and therefore the state itself is not a good control.

Finally a larger share of the Latina-White gap is explained than the Black-White gap. Mechanically, much of the difference in the explained effects is due to the explanatory power of the larger differences in educational attainment and earnings between Latinas and White women. Higher rates of fertility as well as lower earnings (interacted with higher fertility) also make the variables relating to children more explanatory of the gaps between Latinas and White women.

Alternative decomposition using linear regression

Another conceptually similar approach to understanding the role of covariates in explaining racial and ethnic differences in exits is to break down our baseline regression into steps where we first include the race/ethnicity coefficients alone, and then we add categories of covariates to examine how they change the mean differences between race/ethnicity groups.

Equation 1 formalizes this approach in terms of coefficients on an indicator of whether someone is a Black woman (α_1) or a Latina (α_2). Changes in α_1 and α_2 show to what extent correlations with controls in the matrix X are able to account for different rates of exits by race and ethnicity. Conceptually, if differences in the covariates themselves explained all of the racial and ethnic differences in exits, then the coefficients on race and ethnicity would go to zero.

$$\text{Exit} = \alpha_1 \text{Black} + \alpha_2 \text{Latina} + \beta X + \varepsilon \tag{1}$$

Table 5 presents this approach both in the pre-pandemic period and during the pandemic. When looking across the table at how the coefficients change, we can again see the importance of education, industry and occupation, and earnings in explaining differences in exits both before the pandemic and during between women of color and White women. Looking further across the columns, we see some role for marital status, children, and children interaction variables.

We include this approach for completeness, but we prefer the Oaxaca-Blinder-Fairlie decomposition because the exact contribution of each covariate is difficult to assess as it heavily depends on the order that the coefficients are added in. In contrast, the main results in Table 4 are averaged so

Table 4: Decomposition of Gaps in Exits During the Pandemic

		Latina			Black	
Variable groupings	Before	During	Difference	Before	During	Difference
Children	0.001	0.002	0.002	0.000	0.001	0.001
	(0.0007)	(0.0019)		(0.0002)	(0.0015)	
Interactions with children	0.001	0.005	0.004	0.000	0.004	0.004
	(0.0009)	(0.0025)		(0.0005)	(0.0021)	
Earnings	0.007	0.007	0.000	0.003	0.004	0.001
	(0.0011)	(0.0024)		(0.0005)	(0.0015)	
Education	0.012	0.012	0.000	0.003	0.004	0.002
	(0.0018)	(0.0040)		(0.0005)	(0.0015)	
Industry and occupation	0.005	0.006	0.001	0.001	0.003	0.002
	(0.0010)	(0.0025)		(0.0003)	(0.0015)	
Married	-0.001	-0.002	-0.001	-0.001	-0.002	-0.001
	(0.0003)	(0.0011)		(0.0007)	(0.0025)	
Age	0.001	0.000	0.000	0.001	0.000	0.000
	(0.0003)	(0.0004)		(0.0002)	(0.0004)	
State	0.003	0.001	-0.002	0.002	0.000	-0.002
	(0.0013)	(0.0036)		(0.0006)	(0.0023)	
Level	0.087	0.117	0.031	0.067	0.096	0.029
Difference	0.039	0.060	0.021	0.019	0.039	0.020
Explained	0.030	0.033	0.003	0.009	0.011	0.002
Observations	86,377	8,787		86,377	8,787	

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 earnings 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.

that the order variables are introduced does not matter.[2]

[2]More precisely the results are based on an averaging of 1,000 different random orderings due to the nonlinear form of the specification.

Table 5: Excess Exits Sequentially Adding Covariates as Decomposition

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Pre-pandemic									
Black	0.0193	0.0133	0.0129	0.0111	0.0138	0.0128	0.0130	0.0107	0.0119
	(0.0024)	(0.0025)	(0.0025)	(0.0025)	(0.0025)	(0.0025)	(0.0025)	(0.0026)	(0.0026)
Latina	0.0393	0.0216	0.0193	0.0178	0.0184	0.0171	0.0170	0.0140	0.0131
	(0.0026)	(0.0029)	(0.0029)	(0.0028)	(0.0028)	(0.0028)	(0.0028)	(0.0032)	(0.0033)
Pandemic									
Black	0.0391	0.0292	0.0270	0.0247	0.0297	0.0274	0.0276	0.0270	0.0271
	(0.0089)	(0.0075)	(0.0079)	(0.0080)	(0.0086)	(0.0081)	(0.0080)	(0.0083)	(0.0081)
Latina	0.0600	0.0348	0.0319	0.0293	0.0306	0.0286	0.0278	0.0243	0.0238
	(0.0101)	(0.0108)	(0.0115)	(0.0110)	(0.0110)	(0.0112)	(0.0109)	(0.0111)	(0.0111)
Pre-pandmic observations	86,377	86,377	86,377	86,377	86,377	86,377	86,377	86,377	86,377
Pandemic observations	8,787	8,787	8,787	8,787	8,787	8,787	8,787	8,787	8,787
Education		X	X	X	X	X	X	X	X
Industry and occupation effects			X	X	X	X	X	X	X
Weekly earnings (standardized)				X	X	X	X	X	X
Married					X	X	X	X	X
Children						X	X	X	X
Children interactions							X	X	X
State								X	X
Age									X

Note: This table predicts excess exits starting by controlling only for race and ethnicity. Each column adds additional covariates sequentially until the final column matches our baseline specification in Table 2. See footnotes of Table 2 for more details.

Differential effects of children by race-ethnicity

Our Oaxaca-Blinder-Fairlie decomposition shows that a large proportion of the gap in excess exits between women of color and White women remains unexplained. An underlying assumption of the decomposition is that the effect of the covariates on exits is the same across racial and ethnic groups. In order to test whether the effects of children were larger for Black women and Latinas, we augment our baseline model to include interactions between the presence of children and the race and ethnicity of the woman. Unfortunately we lack precision to estimate these interaction terms definitively. The point estimates suggest that the effect of living with a child under 6 was greater on women of color's excess exits, while living with a child aged 6 to 12 was either the same or perhaps less important. Interpreting these effects; however, requires us to hold constant marital status and earnings, which we know differ by race and have their own effects on excess exits by race.

Table 6: Effects of Children on Labor Force Exits Interacted with Race-Ethnicity

Variables	(1) Pre-pandemic	(2) Pandemic	(3) Excess: pandemic and pre-pandemic	(4) Excess: pandemic and Great Recession
Latina	0.009	0.021	0.012	0.002
	(0.004)	(0.012)	(0.012)	(0.013)
Latina by lived with child aged 0 to 5	0.000	0.033	0.032	0.048
	(0.007)	(0.028)	(0.027)	(0.031)
Latina by lived with child aged 6 to 12	0.013	-0.014	-0.027	-0.011
	(0.007)	(0.012)	(0.013)	(0.018)
Lived with a child aged 0 to 5	0.008	0.026	0.018	0.020
	(0.006)	(0.015)	(0.015)	(0.017)
Lived with a child aged 6 to 12	-0.001	0.026	0.027	0.027
	(0.005)	(0.019)	(0.018)	(0.019)
Black	0.011	0.022	0.011	0.015
	(0.004)	(0.009)	(0.009)	(0.010)
Black by lived with child aged 0 to 5	-0.007	0.029	0.037	0.019
	(0.010)	(0.019)	(0.020)	(0.023)
Black by lived with child aged 6 to 12	0.009	-0.006	-0.014	-0.005
	(0.008)	(0.023)	(0.023)	(0.025)
Earnings (normalized) by lived with child aged 0 to 5	-0.013	-0.029	-0.016	-0.013
	(0.002)	(0.006)	(0.006)	(0.007)
Earnings (normalized) by lived with child aged 6 to 12	-0.001	-0.018	-0.017	-0.017
	(0.002)	(0.006)	(0.005)	(0.006)
Married by lived with child aged 0 to 5	0.011	0.017	0.007	0.003
	(0.007)	(0.016)	(0.016)	(0.017)
Married by lived with child aged 6 to 12	0.007	-0.011	-0.018	-0.011
	(0.004)	(0.022)	(0.021)	(0.021)
Previous weekly earnings (normalized)	-0.010	-0.011	-0.000	0.006
	(0.001)	(0.005)	(0.004)	(0.005)
Was married	0.011	0.017	0.006	0.012
	(0.002)	(0.005)	(0.005)	(0.007)
Observations	86,377	8,787	95,164	45,919
Standard controls	X	X	X	X

Note: Table shows augmented specification from Table 2 that adds interaction terms between race-ethnic indicators and the presence of children indicators. See footnotes of Table 2 for more details.