

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

Katherine Lim* Mike Zabek[†]

September 27, 2021

Abstract

Increases in labor force exits during the COVID-19 pandemic were larger for Black women, Latinas, and women living with children. After controlling for detailed job and demographic characteristics, we estimate larger increases in labor force exits among women living with children under age 6 and among lower-earning women living with school-age children. Women of color also had larger increases in labor force exits during the pandemic, and one-quarter of these excess exits can be explained by differences in household structure. Our results suggest that caring for children contributed to persistent excess labor force exits among women during the pandemic.

Keywords: Women, Labor Force Participation, Race, Ethnicity, Labor Supply, COVID-19

JEL Numbers: J16, J70, H31, I14, I18

*Federal Reserve Bank of Minneapolis; 90 Hennepin Ave; Minneapolis, MN 55401; katie.lim@mpls.frb.org.

[†]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. This project has benefited from comments from John Bound, David Buchholtz, Curie Chang, Jeff Larrimore, Alicia Llorio, Joshua Montes, Ryan Nunn, Jessica Ott, Christopher Smith, and Erin Troland, among others. The opinions, analysis, and conclusions are those of the authors and do not indicate concurrence by the Federal Reserve Board, the Federal Reserve Bank of Minneapolis, the Federal Reserve System, anyone associated with these organizations, or anyone else.

The COVID-19 pandemic led to unprecedented employment declines as major economic activities, including jobs and children's schooling, were curtailed in the name of public health. While some aspects of the pandemic recession have followed previous recessions, with less-educated workers and workers of color suffering larger employment losses (Cortes and Forsythe (2020); Couch, Fairlie and Xu (2020)), others have been atypical. In particular, in this recession women's employment declined by more than men's in percentage terms (Albanesi and Kim (2021)).

In this paper, we examine differences in the labor force participation of women in the United States in the fall and winter of 2020-2021 across two distinct dimensions. First, we explore differences by race and ethnicity, highlighting larger declines in labor force participation rates and higher rates of labor force exits among women of color. These patterns mirror differences in layoffs early in the pandemic that more severely affected Latinas and Black women. Second, we study the experiences of women living with children to test if the unique demands of raising children during the pandemic, with widespread closures of schools and daycares, led to additional labor force participation declines and exits. We find that women living with children had larger declines in labor force participation and were more likely to leave the labor force relative to non-mothers. For mothers of school-age children, this effect was concentrated among lower-earning workers. Our analysis then links these two findings by showing that differences associated with the presence of children explain around one-fourth of the excess labor force exits we document among Latina and Black women.

Our examination of labor force participation by race and ethnicity of women shows how disparities early in the pandemic were also reflected in longer term movements out of the labor force. In particular, Canilang et al. (2020), Cortes and Forsythe (2020), and Couch, Fairlie and Xu (2020) all show that women and workers of color faced the steepest initial employment declines during the early months of the pandemic. The employment losses translated into disproportionately sharp and persistent declines in labor force participation for Black women and Latinas, but not for men of color. Labor force participation decreased by 2 percentage points more for Black women and Latinas than it did for White women. Additionally, the differences remained relatively stable over the six months from September 2020 to

March 2021. The same was not true for Black men and Latinos. Although men of color had larger declines in labor force participation early in the pandemic, these differences moderated in the fall of 2020 such that labor force participation rate declines are now similar in percentage point terms for men across races and ethnicity.

Declines in labor force participation among Black women and Latinas were largely driven by women who were employed before the pandemic and who exited the labor force but indicate some interest in future employment. These results point to a sizable group of workers who, while out of the labor force, may be willing to return to employment as pandemic and labor market conditions change. This finding of varying levels of labor force attachment in a recession mirrors earlier examinations of pro-cyclical racial differences in unemployment (Freeman (1973), Couch and Fairlie (2010)). They also relate to studies of differential effects of business cycles on more disadvantaged workers (Hoynes, Miller and Schaller (2012); Aaronson et al. (2019); Schwandt and von Wachter (2019)) and studies focusing on hysteresis after recessions (Blanchard and Summers (1986); Layard, Nickell and Jackman (2005); Yagan (2019)).

Our work on the role of children corroborates previous findings that among women, mothers had higher labor force participation declines (Albanesi and Kim (2021)), but we focus specifically on explaining labor force exits. We find that all women living with children under age 6 and women living with children aged 6 to 12 who were working low-wage jobs were more likely to exit the labor force during the pandemic than women without children even after controlling for education, earnings, and COVID-19 occupation and industry measures. When we focus on excess exits relative to previous years, we find that a single woman, earning a average wage, living with a child aged 0 to 5 was 5 percentage points more likely to exit the labor force relative to a similar woman with no children at home. Among women with primary-school-aged children in the household, the excess pandemic-era labor force exits were concentrated among lower-earning women. These results partially validate the widespread belief during the pandemic that childcare accessibility and pandemic health concerns were restricting women's labor force participation.

The findings shed light on which women with children have seen labor force participation changes by separating the effects by children's ages and allowing for

different effects by previous earnings and marital status. They complement earlier studies of the impacts of school and child care closures (Heggeness (2020), Russell and Sun (2020), and Luengo-Prado (2021)). Added nuances also build on previous work studying women's pandemic labor market experiences (Leigh, Montes and Smith (2021) and Pitts (2021)), and they provide context for designing policies to encourage reemployment.

Our finding that excess exits during the pandemic were more common among women living with children also inform the literature linking childcare with women's labor force participation. The pandemic led to major disruptions and increases in uncertainty associated with childcare as opposed to merely increasing its cost. During the COVID-19 pandemic, formal childcare became unreliable for many parents due to shifting health requirements, lockdowns, and localized outbreaks in schools and childcare centers. Informal childcare from grandparents or other family members was also less available due to health concerns and social distancing requirements. Our findings are consistent with previous work suggesting that the cost of childcare but also the reliability and access to informal care can influence mothers' labor force participation (Compton and Pollak (2014), Bick (2016), Morrissey (2017), Krolikowski, Zabek and Coate (2020)).

The labor force exits we identify in the paper are likely to have lasting negative effects on women's future earnings. A large share of the gender earnings gap can be attributed to workforce interruptions that are more common for women (Blau and Kahn (2017)), and a recent study on job displacements found that the negative earnings effects are largest for women with small children (Illing, Schmieder and Trenkle (2021)). The women who experienced the largest increases in exits were single women with small children and lower-income women with school-aged children, two groups for whom actual and potential earnings losses may be especially detrimental for them and their families.

Finally, this work offers a link between the disparate employment effects of the pandemic for women of color and for caregivers by showing that the differences in the presence of children and their interaction with earnings and marital status explain some of the higher levels of labor force exits among women of color.

The results are important for policymakers to understand and address disparities

in the labor market that arose during the COVID-19 pandemic. The later stages of the post–Great Recession recovery saw disproportionate increases in the participation of workers of color as wages and labor demand rose. As of August 2021, labor force participation rates among Black Americans were 1.5 percentage points lower than in February 2020, and Latinx labor force participation was 2.4 percentage points lower. These labor force participation rates remain at levels not seen since 2016. Similarly, labor force participation rates for mothers of children of all ages generally rose between 2015 and 2019 during a strong labor market.¹ Among women with children under age 18, labor force participation rate fell in 2020 to 71.2 percent from 72.3 percent in 2019 (Bureau of Labor Statistics (2021)). Differences by race and ethnicity have also taken on an increased importance in many eyes because of the disproportionate effects of COVID-19 on Latinx and Black Americans. The pandemic has also provided momentum for rethinking caregiving and its impacts on the economy. Understanding the drivers of differential labor force exits during the COVID-19 recession is an important step in addressing broader disparities during the economic recovery.

I Data

In this paper, we study labor force participation of women during the first year of the COVID-19 pandemic, with a focus on outcomes from September 2020 to February 2021. Our analyses use monthly data from the Current Population Survey (CPS) from the U.S. Census Bureau accessed from IPUMS (Flood et al. (2020)).² Our sample includes women aged 25 to 54 to focus on prime-working-age individuals.

The initial portion of our analysis plots various outcomes over time using a seasonally adjusted three-month moving average.³ Our outcome measures use information about employment status and labor force information to classify respondents

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

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

³We use average monthly values computed from January 2003 to February 2020 to adjust for monthly seasonality in our outcome variables. All outputs are weighted using sampling weights.

as employed, unemployed, or out of the labor force.

We study outcomes by respondent race and ethnicity and the presence of children in the household. We characterize respondents as Latinx if they say they are of Hispanic, Latino, or Spanish origin. Among those who answer that they are not Latinx, we characterize them according to their (single) reported race as Black, White, Asian, or other. Respondents who report Native American, Native Hawaiian or Pacific Islander, or multiple races are included in the “other race” category.⁴ 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.

Much of our analysis focuses on individuals who were employed before the pandemic using CPS annual linkages.⁵ We limit ourselves to this population for a few reasons. First, the outcome patterns we identify using the full sample are driven by those who were previously employed. Second, this population represents individuals who policymakers are likely to focus on in promoting their return to work. If individuals were working before the pandemic, then they are more likely to be willing and able to return to the labor force than the average individual who is out of the labor force. Third, job characteristics before the pandemic are available only for people who were employed before the pandemic. Finally, exits are more precisely measured than entries in the CPS, particularly among smaller subgroups. All results using linked observations are weighted using longitudinal weights provided by IPUMS.

In our analysis of labor force exits, we characterize the exits along two additional dimensions. First, we study individuals who respond that caregiving is the reason they are out the labor force. Second, we use responses to two CPS questions to identify individuals who are not in the labor force but express some interest in

⁴Due to small sample sizes in the other categories we restrict many results to showing Latinx, Black, and White.

⁵We use an exact 12 month lag to determine employment status with no job tenure requirement. For many analyses this is equivalent to linking the respondents’ surveys when they are in the outgoing rotation group.

working. Specifically, we use responses to questions about whether individuals plan to search for work in the next 12 months or say they want or would accept employment.

We also consider industry- and occupation-level impacts of COVID-19 as measured by special questions added to the CPS about COVID-19 in the summer of 2020. Specifically, we construct industry- and occupation-level indices of the percentage change in industry employment from one year earlier, the share of workers who are working from home, and the share of workers who said they had lost work in the past four weeks because of the pandemic (regardless of whether they were paid). To remove a mechanical correlation in our measures as they are applied to women's labor force exits, we consider the pandemic labor market experiences of men to construct our measures. We also increase our sample size in sometimes small (four digit) industries and occupations by using observations across the entire summer, from May to August 2020.⁶

II Declines in Labor Force Participation

As previous studies have documented, the pandemic recession was atypical in that employment losses were larger for women relative to men (Albanesi and Kim (2021)), and they were particularly large for women of color during the early months of the pandemic (Couch, Fairlie and Xu (2020), Cortes and Forsythe (2020)). As we show in figure 1, these employment losses translated into higher percentage point declines in labor force participation among prime-working-age Black women and Latinas relative to White women. The initial decline in labor force participation among these groups was more than 4 percentage points, while White women experienced a decline of around 2 percentage points, and Asian women saw no decline in labor force participation. In the fall and winter of 2020, Black women saw an increase in their labor force participation, while participation among Latinas remained persistently lower. While men of color also experienced large declines in

⁶Our 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.

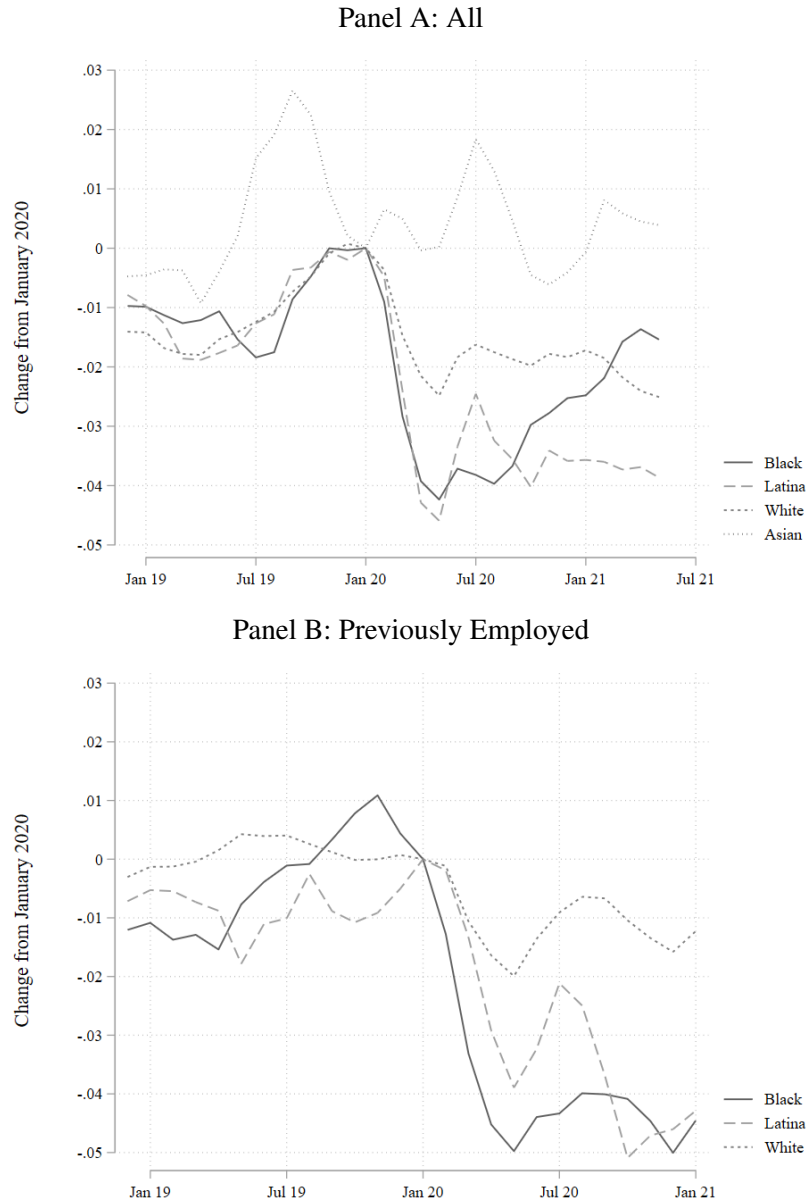
both employment and labor force participation early in the pandemic, labor force participation changes among men of different races and ethnicity converged beginning in the fall of 2020.

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

Next, we match CPS respondents to their interviews from one year before to examine how pandemic labor force participation differed between women who were previously employed and those who were not. Separating the sample by previous employment allows us to distinguish between changes in exits and entries that contribute to patterns of declining women's labor force participation. The matching process reduces our sample size significantly. As a consequence, the precision of the estimates conditional on previous employment status decreases, and so we show results only for Black women, Latinas, and White women in this section. Additionally, because we plot three-month averages, we only use matched respondents through January 2021 to avoid conditioning on pandemic-era employment, which we categorize as any observation in March 2020 or later.

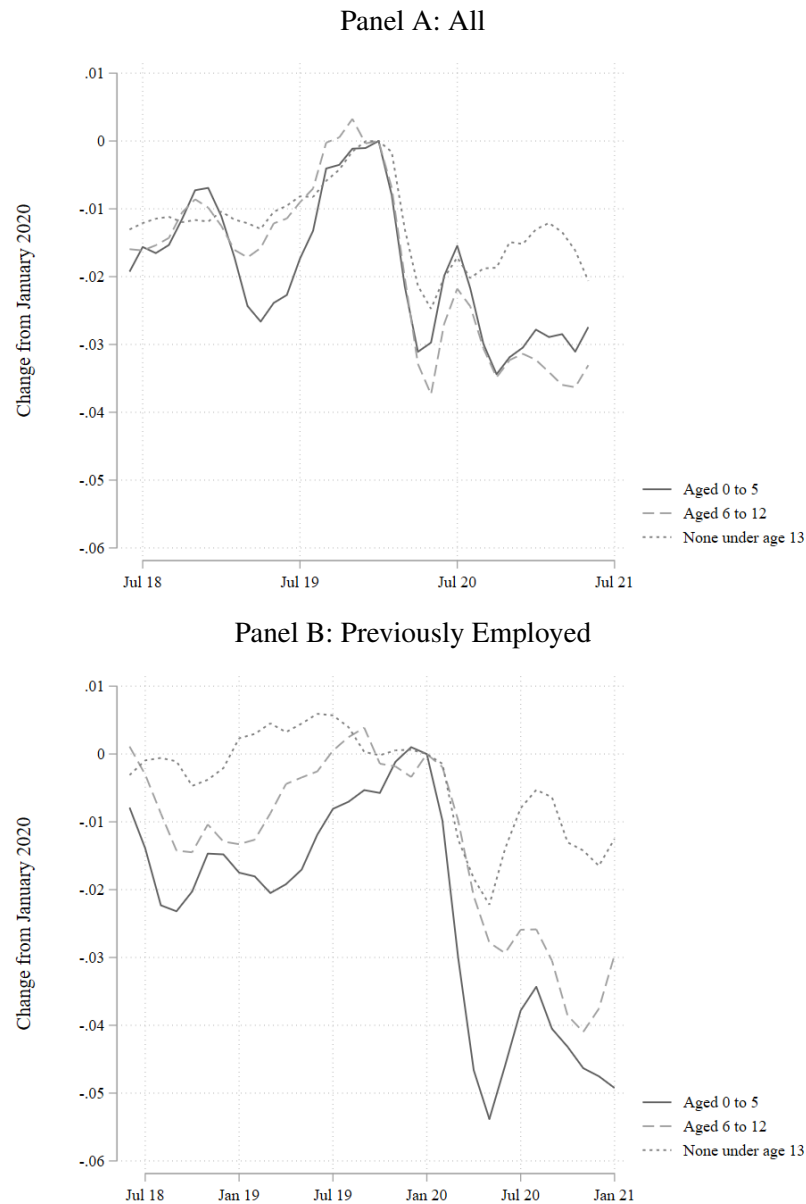
We find that the decline in women's labor force participation is driven primarily by previously employed women exiting the labor force (panel B of figures 1 and 2). The patterns by race and ethnicity suggest that employment losses translated into labor force exits for women in general and Black women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

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



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

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



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

labor force entry during the pandemic, particularly among Black women.⁷

To more directly compare the role of exits and entries in the declining labor force participation rates of women by race and ethnicity, we predict counterfactual pandemic era exit and entry rates using the previous years' transition rates. The rates are predicted for April 2020 to January 2021 using rates from April to January 2015 to 2020. We compare these counterfactual rates with the actual exit and entry rates conditional on previous employment to generate an estimated labor force decline.⁸ Consistent with the trends plotted in figure 1, we see larger declines, relative to the counterfactual, for Black women and Latinas relative to White women, and, based on this calculation, the share of the decline attributed to increased exits is 88 percent for Black women, 50 percent for Latinas, and 70 percent for White women. For the remainder of the paper, we will focus only on the previously employed. While decreasing entry may have a role in explaining different pandemic labor market experiences by race and ethnicity, we leave it to future researchers with larger data sets to further explore patterns in labor market entry.

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

⁷The share of nonemployed women is between 20 and 30 percent of the total sample so estimates that require matched samples conditional on previous nonemployment are subject to more sampling error than overall estimates or those conditional on previous employment. In regressions not reported, pandemic-era changes in labor force participation among women previously not employed are not statistically different from pre-pandemic changes.

⁸The counterfactual exit rate during the pandemic for race or ethnicity group j is calculated as $\Pr(\text{LFP}_{j,2019}|\text{emp}_{j,2018})$. The excess exits are calculated as $[\Pr(\text{LFP}_{j,2020}|\text{emp}_{j,2019}) - \Pr(\text{LFP}_{j,2019}|\text{emp}_{j,2018})] * \text{emp}_{j,2019}$. The decline in entry is similarly calculated as $[\Pr(\text{LFP}_{j,2020}|\text{notemp}_{j,2019}) - \Pr(\text{LFP}_{j,2019}|\text{notemp}_{j,2018})] * \text{notemp}_{j,2019}$.

III Modeling Labor Force Exits

This section analyzes possible explanations underlying the racial and household composition patterns in labor force exits during the pandemic. We examine overall pandemic-era exits but then focus specifically on the increase in exits during the pandemic relative to previous years. We use linear probability models to predict the likelihood that a woman who was previously employed will have exited in the one year ending between September 2020 and February 2021. The period coincides with the beginning of the typical 2020-21 school year and the conclusion of the first six months of the pandemic. It is the latest we can measure labor market exits during the pandemic using the CPS. As with all results, we use a sample of prime-working-age (aged 25 to 54) women.

We present two different but related specifications to highlight factors associated with, first, all exits during the COVID-19 pandemic and, second, exits in excess of previous years.

Our first specification, equation 1, examines predictors of all exits during the pandemic among women whose last CPS interview was between September 2020 and February 2021. The β_0 coefficients show the impact of variables, or an interaction of variables, on the probability that a woman exits the labor force during this period conditional on having been working one year before.

Our second specification, equation 2, allows us to examine labor force exits in excess of historical trends – highlighting characteristics that were predictive of higher labor market exits during the pandemic relative to the years before. To measure excess exits, we use data from before the pandemic, from February 2015 to 2020, as a baseline for previous rates of labor force exits. The coefficients in β_1 estimate the effect of characteristics on the likelihood of leaving the labor force in the period before the pandemic. β_2 , our coefficients of interest, estimate the additional impact of each variable on excess exits during the pandemic.

$$\text{Exit} = X\beta_0 + \varepsilon_1 \tag{1}$$

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

Our main results focus on overall exits, but we also examine exits where the respondents say they are out of the labor force due to childcare reasons and exits where the respondents express interest in working.

Covariates and Summary Statistics

Table 1 shows averages and standard deviations for our outcome variables and covariates collected in the CPS. To show how differences in covariates could contribute to varying levels of exits during the pandemic, table 1 presents statistics for all women (overall) and then breaks out statistics for Latinas, Black women, and White women who were employed before the pandemic.⁹

The first two rows of table 1 show that 8 percent of women left the labor force in 2020 after being previously employed and that 5 percent did so and named caregiving as a reason. Women attributed more than one-half of labor force exits to caregiving, highlighting the importance of childcare and schooling disruptions during the pandemic. Latinas were especially likely to name caregiving, both in terms of having the highest overall proportion of exits attributed to childcare and these exits making up a high proportion of all exits.

Around 3 percent of women who were previously employed exited the labor force but expressed interest in working. Like exits overall, the percentages were higher for Latinas and Black women relative to White women. These figures represent increases when compared with previous years. During the pandemic, there was a 1.7 percentage point rise in the overall share of women previously employed who, while out of the labor force, responded that they wanted a job or planned to look for work in the next year—from 1.3 to 3.0 percent of all prime-working-age women.¹⁰ Consistent with the patterns of labor force exit, the increases were larger for Black women and Latinas who saw a 3.1 percentage point and 3.0 percentage point increase in the share out of the labor force but indicated interest in working, respectively. Women living with children under age 13 had around a 3.2 percentage

⁹With the exception of exits, age, and education, the values come from the interview before March 2020.

¹⁰Specifically, 1.3 percent of previously employed women were out of the labor force but expressed interest in working from September 2019 to February 2020. Note that these results are not shown in the table.

Table 1: Summary Statistics

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

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

point increase in the share who exited the labor force but expressed interest in working compared with a 1 percentage point increase among women with no children under age 13 in the household.¹¹

Latinas, in particular, also had covariates that predicted much more severe labor market impacts of COVID-19. Table 1 shows that Latinas were employed in occupations and industries that had larger employment declines, lower prevalences of remote working, and higher shares of workers who lost work as a result of the pandemic. Around 15 percent of Latinas had less than a high school degree, compared to 5 percent of Black women and 2 percent of White women. Additionally, Latinas earned an average weekly wage of \$780 compared with \$1,040 for White women. Latinas are also more likely to be living with children compared with other groups of women.

Black women also had covariates predicting more severe impacts, though to a smaller degree than for Latinas. Table 1 shows that the average predicted occupational job loss for a Black woman was 23 percent, compared with 24 percent for a Latina and 19 percent for a White woman. Black women were also less likely than White women to be in occupations and industries where working from home as a result of COVID-19 was common. Black women also earn substantially less and have lower average levels of education compared with White women, and they are less likely to be married.¹²

Exits during the Pandemic

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

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

¹² These statistics reflect the effects of broader economic and social inequalities on women and families.

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

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

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

Table 2: Predictors of Labor Force Exits

	(1) Exit	(2) Caregiving	(3) Interest in working	(4) Excess exits
Less than high school	0.081 (0.017)	0.067 (0.025)	-0.006 (0.013)	0.024 (0.021)
High school or GED	0.018 (0.002)	0.020 (0.005)	-0.005 (0.008)	0.004 (0.005)
Bachelor's degree (only)	-0.006 (0.003)	0.002 (0.005)	-0.008 (0.005)	-0.003 (0.004)
More than a bachelor's degree	-0.014 (0.004)	0.001 (0.003)	-0.011 (0.005)	-0.008 (0.005)
Previous weekly wage (normalized)	-0.011 (0.005)	-0.006 (0.004)	-0.002 (0.002)	-0.001 (0.004)
Industry employment change	-0.006 (0.048)	0.027 (0.039)	-0.015 (0.027)	0.015 (0.045)
Industry share working from home	-0.006 (0.024)	-0.019 (0.013)	0.003 (0.012)	-0.015 (0.024)
Industry share unable to work due to COVID-19	0.071 (0.050)	0.054 (0.032)	0.064 (0.026)	0.043 (0.049)
Occupation employment change	-0.006 (0.018)	-0.001 (0.009)	0.002 (0.010)	0.003 (0.019)
Occupation share working from home	-0.030 (0.023)	-0.023 (0.018)	-0.020 (0.008)	-0.014 (0.022)
Occupation share unable to work due to COVID-19	0.024 (0.026)	0.011 (0.014)	-0.011 (0.027)	0.012 (0.029)
Lived with a child aged 0 to 5	0.033 (0.011)	0.018 (0.012)	0.013 (0.009)	0.052 (0.011)
Lived with a child aged 6 to 12	0.011 (0.013)	0.022 (0.009)	0.015 (0.006)	0.011 (0.012)
Was married	0.012 (0.006)	0.018 (0.005)	-0.000 (0.003)	0.009 (0.006)
Wage (normalized) by living with a child aged 0 to 5	-0.028 (0.010)	-0.029 (0.010)	-0.015 (0.004)	-0.009 (0.010)
Wage (normalized) by living with a child aged 6 to 12	-0.019 (0.008)	-0.020 (0.006)	-0.013 (0.001)	-0.020 (0.007)
Married by living with a child aged 0 to 5	0.029 (0.016)	0.047 (0.017)	0.010 (0.008)	-0.023 (0.017)
Married by living with a child aged 6 to 12	-0.002 (0.014)	0.003 (0.012)	-0.014 (0.008)	-0.010 (0.014)
Observations	8,745	8,745	8,745	49,278
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	
State by pandemic fixed effects				X
Main effects				X

Note: Shown are coefficients from linear probability models predicting labor force exits, labor force exits attributed to caregiving, and exits in excess of historical patterns (β_2 terms in equation 2). The estimation samples for the first two columns are prime-working-age women from September 2020 to February 2021 who were employed one year earlier in the Current Population Survey. The last column also includes women observed from September 2015 to February 2020 as the group representing historical patterns. An X indicates inclusion of a control.

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

Exits Related to Caregiving

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

Exits Expressing Work Interest

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

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

Excess Exits

Next, we examine predictors of exits in excess of pre-pandemic trends. Focusing on exits in excess of historical trends (β_2 in equation 2) allows us to highlight changes in women's careers that likely would not have occurred in the absence of the pandemic.¹³

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

The characteristic associated with the largest effect on excess exits was living with children under age 6 before the pandemic, and the estimated effect varies with marital status and pre-pandemic earnings. The coefficient on living with a child under age 6 in column 4 of table 2 shows that living with a child under age 6 was associated with 5 percentage points higher excess exits among single women earning average wages relative to similar single women with no children in the household. Living with a child under age 6 was also associated with 3 percentage points higher excess exits among married women earning average wages.¹⁴ The larger increase in exits relative to pre-pandemic levels for single women living with

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

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

young children contrasts with the overall higher pandemic exits for married women living with children shown in column 1. The interaction with pre-pandemic wage levels is statistically insignificant, but the estimate suggests the increase in exits was higher for lower-earning women.

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

We find little evidence that married women had greater increases in exits. For women living with no children under age 13, the estimated effect of being married is to increase exits by a statistically insignificant 0.9 percentage points. For women living with children aged 0 to 5 or 6 to 12, we estimate that married women had smaller increases in exit rates relative to similar single women. 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

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

working full time.¹⁶ However, the negative coefficients on the interaction between being married and living with children suggests that the pandemic has not resulted in larger increases in labor force exits for married women relative to unmarried women. Relative to unmarried women with children under age 6, married women with small children are (an insignificant) 1.5 percentage points less likely to exit the labor force relative to rates before the pandemic. Though the effects are not statistically different from zero, there is enough precision to rule out a 2 percentage point increase in exits during the pandemic among married mothers of young children, relative to unmarried mothers.¹⁷

Beyond variables connected to children we find that other factors were mostly not predictive of additional exits during the pandemic. Excess exits are monotonically decreasing by education, though point estimates are insignificantly different from zero and generally small in magnitude. We also find small and statistically insignificant associations with pre-pandemic wages and industry and occupational impacts of COVID-19. The factors predicting excess exits are also similar to those predicting pandemic-era exits associated with being interested in employment.

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

¹⁶Alon et al. (2020) and Goldin (2020) mention this hypothesis.

¹⁷The 95 percent confidence interval is negative 0.048 to 0.020.

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

Differences by Race and Ethnicity

Table 3, which displays coefficients from our models on indicators for identifying as a certain race or ethnicity, shows that covariates can explain about two-thirds of increased exits for Latinas and a little less than one-half of the excess exits for Black women. Columns 1 and 2 show specifications where all exits are the dependent variable. In these specifications, Latinas had a 6.0 percentage point higher rate of exits compared with White women without including controls and a 2.4 percentage point higher exit rate after including controls shown in column 2 of table 2. Black women had a 4.0 percentage point higher exit rate without controls and a 2.9 percentage point higher exit rate with controls. Similar disparities and reductions upon including controls apply for exits attributed to caregiving in columns 3 and 4. When examining differences in exits combined with an interest in working, we see that Latinas are 2.5 percentage points more likely than White women to have exited the labor force, but are interested in work and Black women are 2.4 percentage points (column 5). With controls, these differences fall to statistically insignificant 1.5 percentage points and 1.8 percentage points, respectively.

Increases in labor force exits were also larger among Latinas and Black women during the pandemic relative to White women. Panel B of table 3 shows the higher rates of exit among Latinas and Black women by examining racial and ethnic differences in exits in excess of historical trends. Column 1 confirms earlier analyses, showing that Latinas had a 2.5 percentage point greater increases in exit rates during the pandemic relative to the increase for White women. Black women had 1.7

percentage points greater increases in their likelihood of exit. Including controls for household composition alone (having children under age 6 and aged 6 to 12) has little effect on the gaps by race and ethnicity in column 2. However, including household controls combined with interactions (with marital status and previous wages, including their main effects) in column 3 lowers the gap for Latinas by 0.7 percentage points and for Black women by 0.3 percentage points. These results show that a little more than one-fourth of the additional exits for Latinas can be explained by differences between White women and Latinas in household structure and previous wages (see table 1 for average levels). Estimating the full model, which includes educational, occupation, and industry level differences, roughly halves the difference with White women.

IV Conclusion

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

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

Changes in women’s labor force participation during the pandemic highlight the

Table 3: Labor Force Exits, by Race and Ethnicity

Panel A: Exits during the Pandemic						
	(1) Exit	(2) Exit	(3) Caregiving	(4) Caregiving	(5) Interest in working	(6) Interest in working
Latina	0.060 (0.010)	0.024 (0.010)	0.049 (0.006)	0.021 (0.005)	0.025 (0.008)	0.015 (0.008)
Black	0.040 (0.009)	0.029 (0.008)	0.016 (0.009)	0.009 (0.009)	0.024 (0.009)	0.018 (0.010)
Observations	8,745	8,745	8,745	8,745	8,745	8,745
Full model		X		X		X
Panel B: Excess Exits						
	(1) Excess exits	(2) Excess exits	(3) Excess exits	(4) Excess exits		
Latina	0.025 (0.010)	0.024 (0.010)	0.018 (0.009)	0.012 (0.011)		
Black	0.017 (0.009)	0.017 (0.009)	0.014 (0.009)	0.010 (0.008)		
Observations	49,278	49,278	49,278	49,278		
Household composition		X	X	X		
Interactions			X	X		
Full model				X		

Note: This table presents coefficients from linear probability models of labor force exits, labor force exits attributed to caregiving, and labor force exits in excess of previous trends. The “Full Model” columns refer to the model presented in table 2 while the other columns include select covariates. Odd columns in panel A include no controls besides race and ethnicity indicators. In panel B, column 1 includes no covariates, column 2 includes only indicators for marital status and living with a child aged 0 to 5 or 6 to 12, column 3 includes indicators for the presence of a child, marital status, previous wages, and the interactions between these covariates, and column 4 presents the full model. The estimation sample is prime-working-age women from September 2020 to February 2021 who were employed one year earlier from the Current Population Survey. X’s indicate that controls are included.

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

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

References

- Aaronson, Stephanie, Mary Daly, William Wascher, and David Wilcox.** 2019. “Okun Revisited: Who Benefits Most from a Strong Economy?” *Brookings Papers on Economic Activity*, 333–375.
- Adams-Prassl, Abi, Teodora Boneva, Marta Golin, and Christopher Rauh.** 2020. “Inequality in the Impact of the Coronavirus Shock: Evidence from Real Time Surveys.” *Journal of Public Economics*, 189: 104–245.
- Albanesi, Stefania, and Jiyeon Kim.** 2021. “Effects of the COVID-19 Recession on the US Labor Market: Occupation, Family, and Gender.” *Journal of Economic Perspectives*, 35: 3–24.

- Alon, Titan, Matthias Doepke, Jane Olmstead-Rumsey, and Michèle Tertilt.** 2020. “The Impact of COVID-19 on Gender Equality.” National Bureau of Economic Research Working Paper 26947.
- Bartik, Alexander W, Marianne Bertrand, Feng Lin, Jesse Rothstein, and Matt Unrath.** 2020. “Measuring the labor market at the onset of the COVID-19 crisis.” National Bureau of Economic Research Working Paper 27613.
- Bick, Alexander.** 2016. “The Quantitative Role of Child Care for Female Labor Force Participation and Fertility.” *Journal of the European Economic Association*, 14(3): 639–668.
- Blanchard, Olivier J., and Lawrence H. Summers.** 1986. “Hysteresis and the European Unemployment Problem.” *NBER Macroeconomics Annual*, 1: 15–78.
- Blau, Francine D., and Lawrence M. Kahn.** 2017. “The Gender Wage Gap: Extent, Trends, and Explanations.” *Journal of Economic Literature*, 55(3): 789–865.
- Bureau of Labor Statistics, U.S. Department of Labor.** 2021. “Labor Force Participation Declines for Mothers and Fathers in 2020.” *The Economics Daily*.
- Cajner, Tomaz, John Coglianese, and Joshua Montes.** 2021. “The Long-Lived Cyclicity of the Labor Force Participation Rate.” *Finance and Economic Discussion Series 2021-047*.
- Canilang, Sara, Cassandra Duchan, Kimberly Kreiss, Jeff Larrimore, Ellen A Merry, and Mike Zabek.** 2020. “Report on the Economic Well-Being of US Households in 2019, Featuring Supplemental Data from April 2020.” Board of Governors of the Federal Reserve System.
- Compton, Janice, and Robert Pollak.** 2014. “Family proximity, childcare, and women’s labor force attachment.” *Journal of Urban Economics*, 79(C): 72–90.
- Cortes, Guido Matias, and Eliza Forsythe.** 2020. “The Heterogeneous Labor Market Impacts of the Covid-19 Pandemic.” *Upjohn Institute Working Paper*, 20(327).
- Couch, Kenneth A., and Robert Fairlie.** 2010. “Last Hired, First Black-White Unemployment and the Business Cycle.” *Demography*, 47(1): 227–247.
- Couch, Kenneth A., Robert W. Fairlie, and Huanan Xu.** 2020. “Early Evidence of the Impacts of COVID-19 on Minority Unemployment.” *Journal of Public Economics*, 192.

- Flood, Sarah, Miriam King, Renae Rodgers, Steven Ruggles, and J. Robert Warren.** 2020. “Integrated Public Use Microdata Series, Current Population Survey: Version 7.0.”
- Freeman, Richard.** 1973. “Changes in the Labor Market for Black Americans, 1948-72.” *Brookings Papers on Economic Activity*, 1973(1): 67–131.
- Furman, Jason, Melissa Kearney, and Wilson Powell III.** 2021. “How Much Have Childcare Challenges Slowed the US Jobs Market Recovery?” *Peterson Institute for International Economics, Real-time Economics Issues Watch (blog)*, May 17: <https://www.piie.com/blogs/realtime-economic-issues-watch/how-much-have-childcare-challenges-slowed-us-jobs-market>.
- Goldin, Claudia Dale.** 2020. “Journey across a Century of Women.” *NBER Reporter*, 2020(3): 1–7.
- Heggeness, Misty 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.
- Hoynes, Hilary, Douglas Miller, and Jessamyn Schaller.** 2012. “Who Suffers During Recessions?” *Journal of Economic Perspectives*, 26(3).
- Illing, Hannah, Johannes F Schmieder, and Simon Trenkle.** 2021. “The Gender Gap in Earnings Losses after Job Displacement.” National Bureau of Economic Research Working Paper 29251.
- Krolikowski, Pawel, Mike Zabek, and Patrick Coate.** 2020. “Parental proximity and earnings after job displacements.” *Labour Economics*, 65(C).
- Layard, Richard, Stephen Nickell, and Richard Jackman.** 2005. *Unemployment: Macroeconomic Performance and the Labour Market*. Oxford University Press on Demand.
- Leigh, Isabel, Joshua Montes, and Christopher Smith.** 2021. “Caregiving and COVID-19.” Board of Governors of the Federal Reserve System.
- Luengo-Prado, María J.** 2021. “COVID-19 and the Labor Market Outcomes for Prime-Aged Women.” Federal Reserve Bank of Boston Current Policy Perspectives Working Paper.
- Morrissey, Taryn 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.

- Musaddiq, Tareena, Kevin Stange, Andrew Bacher-Hicks, and Joshua Goodman.** 2021. “The Pandemic’s effect on demand for public schools, homeschooling, and private schools.” *NBER Working Paper* 29262.
- Pitts, M. Melinda.** 2021. “Where Are They Now? Workers with Young Children during COVID-19.” Federal Reserve Bank of Atlanta Policy Hub Working Paper 2021-10.
- Russell, Lauren, and Chuxuan Sun.** 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.
- Schwandt, Hannes, and Till von Wachter.** 2019. “Unlucky Cohorts: Estimating the Long-Term Effects of Entering the Labor Market in a Recession in Large Cross-Sectional Data Sets.” *Journal of Labor Economics*, 37(S1): S161–S198.
- Yagan, Danny.** 2019. “Employment Hysteresis from the Great Recession.” *Journal of Political Economy*, 127(5): 2505–2558.

V Appendix

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

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

Figure 3 shows that the proportion of women not in the labor force who cite caregiving reasons rose during the pandemic with higher percentage point increases among Black women and Latinas. The plot uses a question asked in the CPS of women who are outside of the labor force and say that they are taking care of house or family when asked if they were “disabled, ill, in school, taking care of house or

family, or something else.” There was an increase in women who were outside of the labor force and who cite this category early in the pandemic for women of all races and ethnicities. The trend extends for Latinas and Black women in particular, whose increases during the pandemic were between 1 and 2 percentage points larger than those for White women beginning in the fall of 2020 although we see some declines during 2021. When we look at increases among women who exited the labor force in panel B, we see that through January 2021 Black women and Latinas had larger percentage point increases in the caregiving measure.

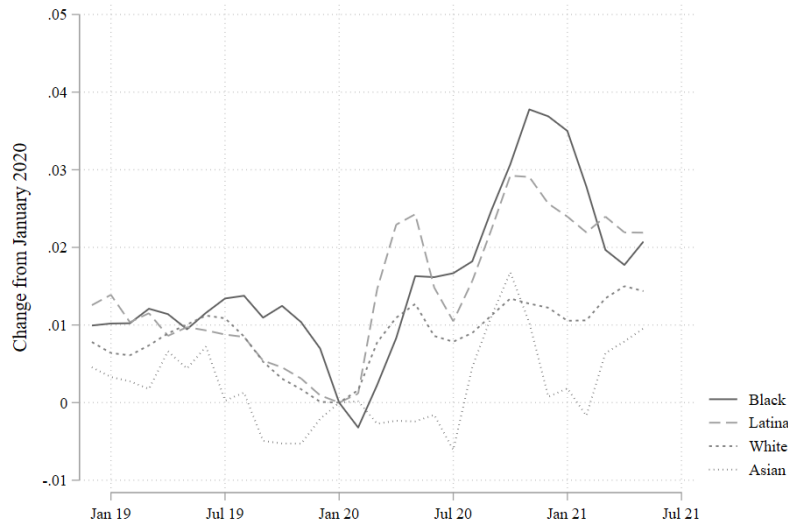
Figure 4 shows that increases in women stating caregiving as the reason they are out of the labor force were larger among women living with children. Women living with children under aged 13 saw nearly a 3 percentage point increase in the share out of the labor force for caregiving reasons relative to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

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

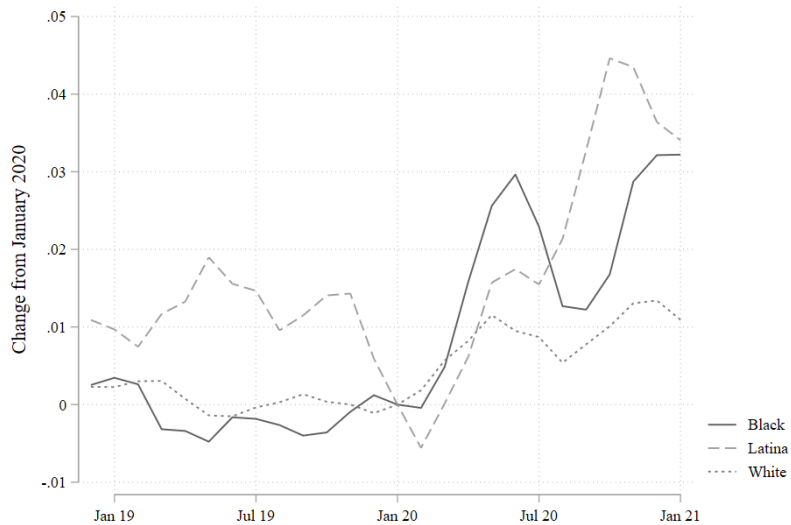
Figure 6 shows that increases in women who are out of the labor force but express interest in working increased for all women during the pandemic. We do not see much difference in the percentage point increases for women living with children compared to those who do not. Among previously employed women,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

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

Panel A: All

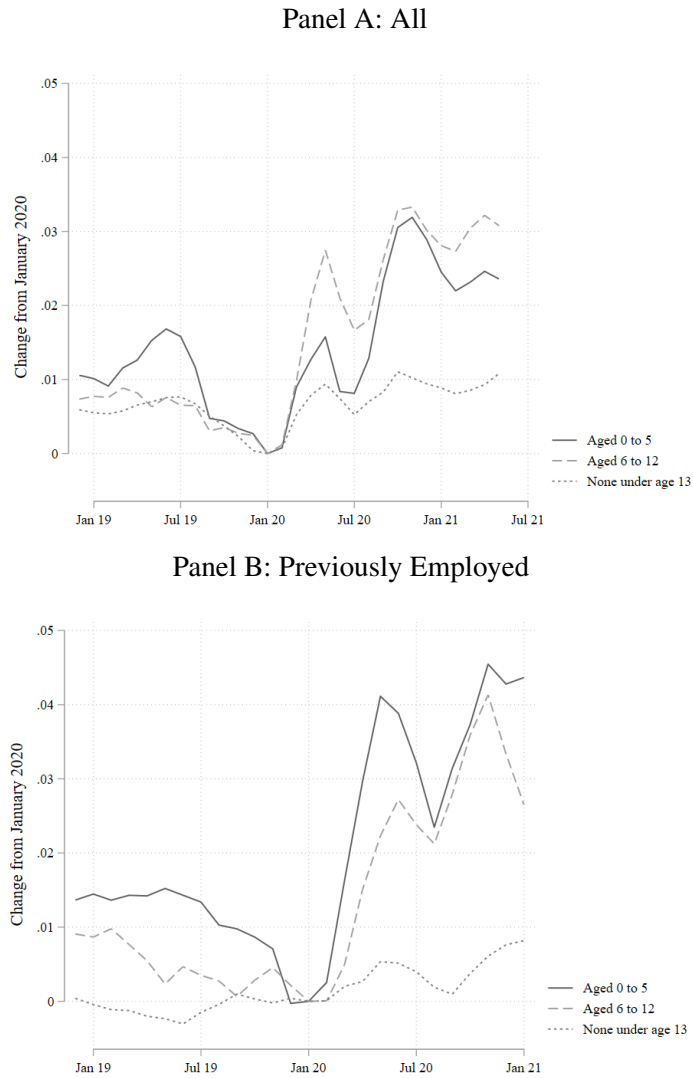


Panel B: Previously Employed



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

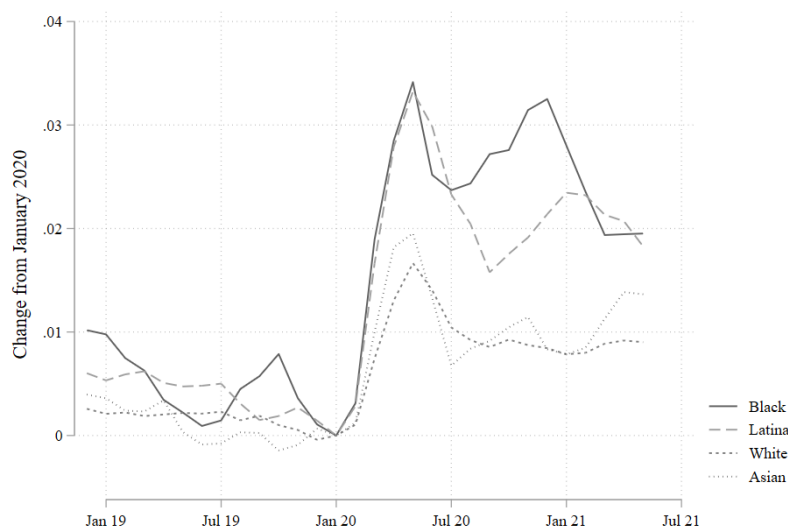
Figure 4: Women Not in the Labor Force by Presence of Children: Caregiving Reasons



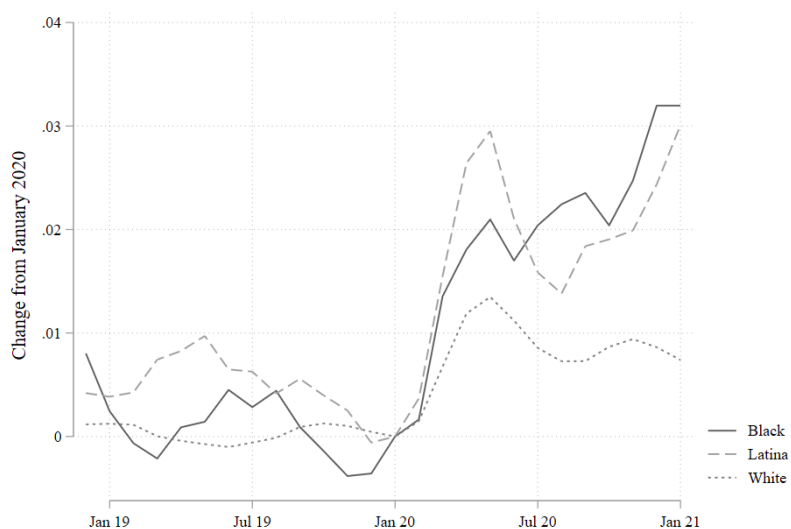
Note: Plotted are three month moving average changes in the rates of respondents not in the labor force stating caregiving as a reason among prime-working-age women by the presence of children aged 0 to 5 and aged 6 to 12 before the pandemic. Each is adjusted for monthly seasonality based on average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

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

Panel A: All



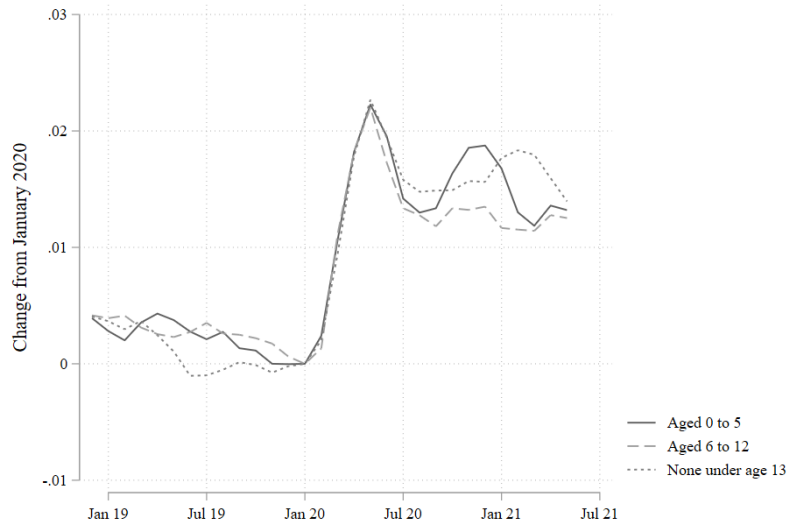
Panel B: Previously Employed



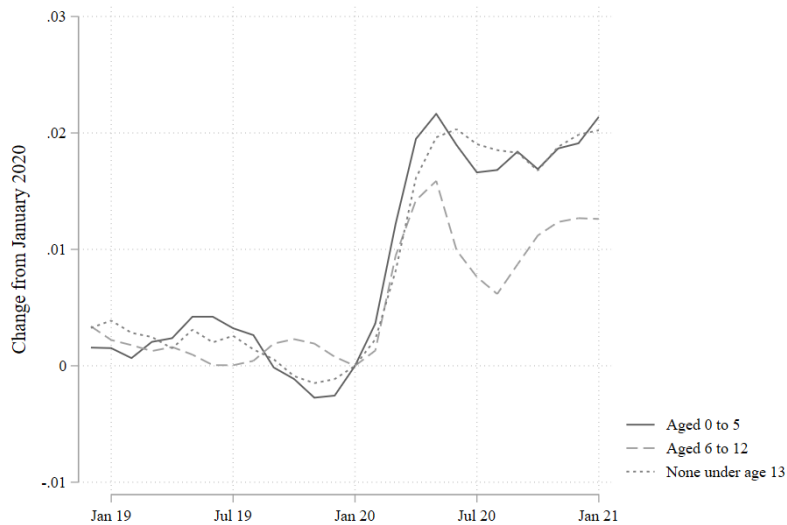
Note: Plotted are three month moving average changes in the rates of respondents expressing interest in working among prime-working-age women by race and ethnicity. Each is adjusted for monthly seasonality based on average monthly values from January 2003 to February 2020. Statistics are weighted using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

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

Panel A: All



Panel B: Previously Employed



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

Comparisons with Men

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

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

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

Robustness

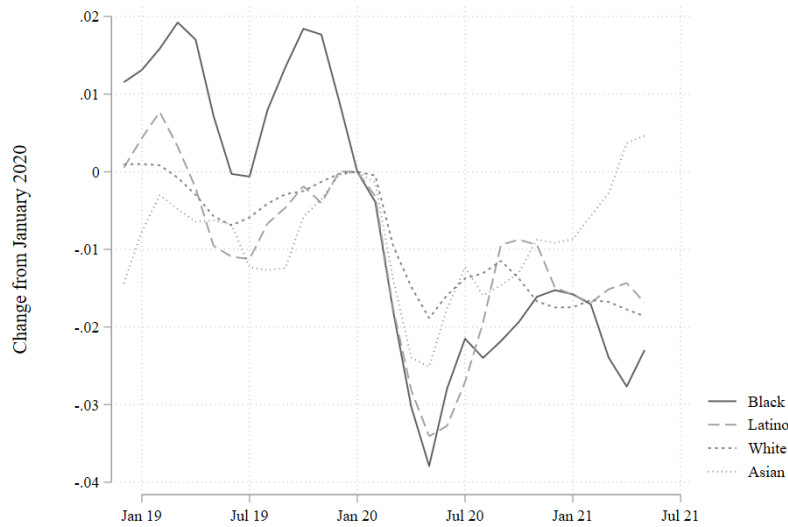
Table 4 shows that the findings from our analysis of women's excess exits during the pandemic are robust to alternative specifications. It shows increasingly detailed specifications in terms of controls, with column 4 representing the result in column 4 of table 2 and column 5 representing the same specification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

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

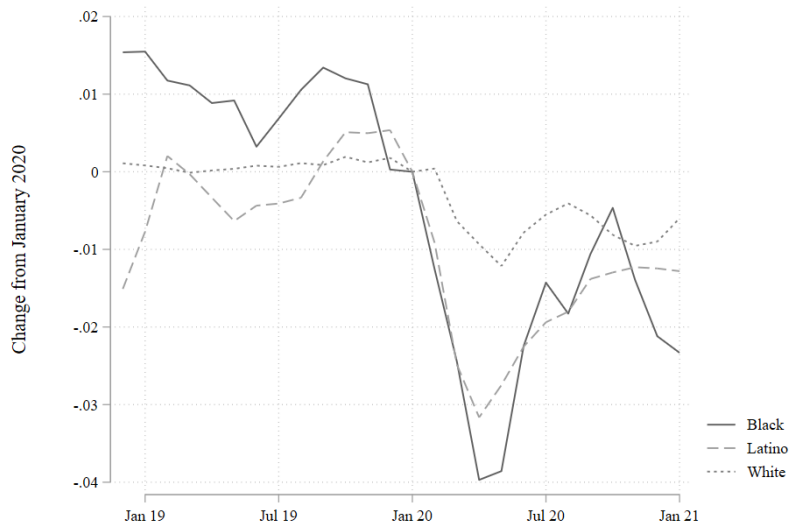
Living with a child aged 6 to 12 and earning low wages before the pandemic is similarly robustly predictive across specifications where it is included. Effect sizes for the interaction term are tightly centered around 2 percentage points in column 4, and statistically different from zero.

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

Panel A: All



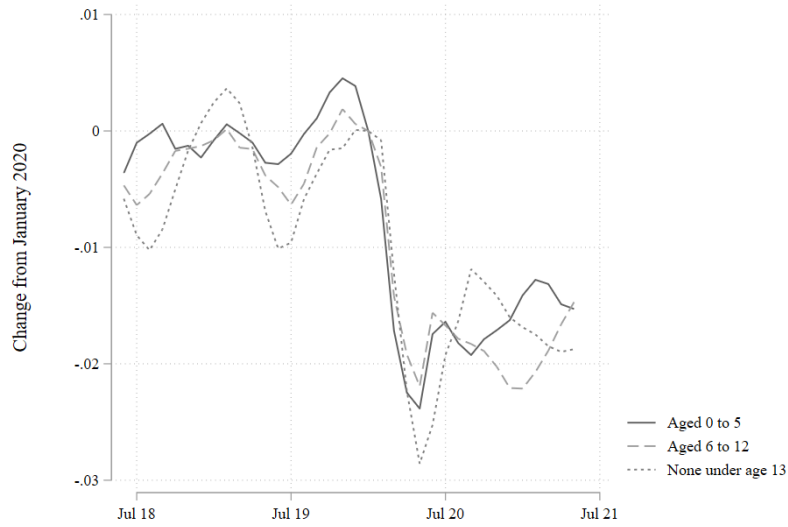
Panel B: Previously Employed



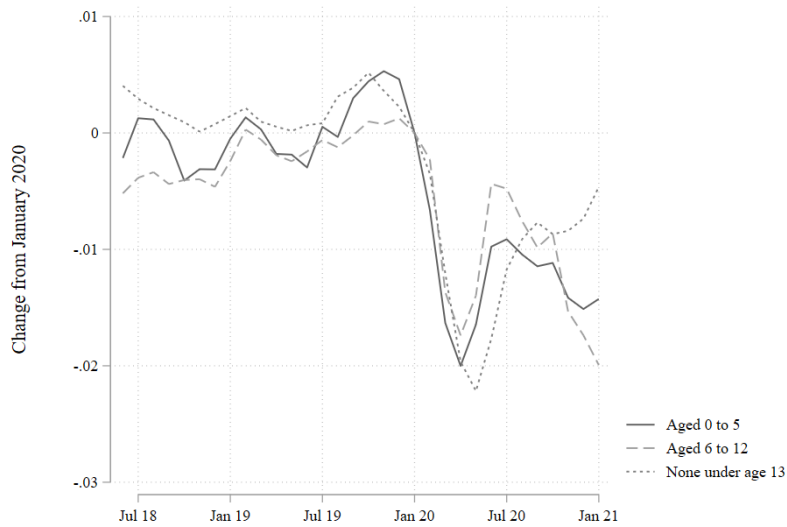
Note: Plotted are three month moving average labor force participation rates for prime-working-age men by race, and ethnicity. Each is adjusted for monthly seasonality based on average monthly values from January 2003 to February 2020. Statistics are weighted using sampling weights. Data are from the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

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

Panel A: All



Panel B: Previously Employed



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

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

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

Table 4: Robustness of Children's Association with Excess Exits

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

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