NBER WORKING PAPER SERIES

WHEN THE KIDS GROW UP:
WOMEN'S EMPLOYMENT AND EARNINGS ACROSS THE FAMILY CYCLE

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Working Paper 30323
http://www.nber.org/papers/w30323

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
August 2022

The authors thank the Russell Sage Foundation (Grant #85-18-05) and the NSF (Grant #1823635) for providing research funding. They are grateful to Jennifer Walsh and Lucy Cheskin for exceptional research assistance throughout the trying pandemic years. This paper is a much-expanded version of “The Other Side of the Mountain: Women’s Employment and Earnings over the Family Cycle,” IFS Deaton Review of Inequalities (2022, forthcoming). The views expressed herein are those of the authors and do not necessarily reflect the views of the National Bureau of Economic Research.

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NBER Working Paper No. 30323
August 2022
JEL No. J01,J16,J31

ABSTRACT

Women earn less than men, and that is especially true of mothers relative to fathers. Much of the widening occurs after family formation when mothers reduce their hours of work. But what happens when the kids grow up? To answer that question, we estimate three earning gaps: the "motherhood penalty," the "price of being female," and the "fatherhood premium." When added together these three produce the "parental gender gap," defined as the difference in income between mothers and fathers. We estimate earnings gaps for two education groups (college graduates and high school graduates who did not complete college) using longitudinal data from the NLSY79 that tracks respondents from their twenties to their fifties. As the children grow up and as women work more hours, the motherhood penalty is greatly reduced, especially for the less-educated group. But fathers manage to expand their relative gains, particularly among college graduates. The parental gender gap in earnings remains substantial for both education groups.

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Life is an adventure, a long hike with difficult ascents, grand panoramas, and a multitude of small pleasures along the way. Part of the adventure, for many, is earning a livelihood and having a meaningful career, while nurturing a family. These often occupy the same time slots and, for most employments, that creates conflict. Mothers often reduce their hours at work and occasionally leave employment for some time or shift into less time-intensive jobs and firms. Those who plan to take off time in the future may invest in careers that impose lower penalties for work with fewer and less demanding hours.

These realities are the main parts of an important and well-explored reason why women earn less than men in the decade or more following the first birth. Less well-explored is what happens to women's careers when the children grow up, require less parental attention, and eventually leave home. That is the topic of this paper.

A large and internationally diverse literature has demonstrated that men and women have divergent earnings growth paths after the birth of a child, even when they were previously on the same career trajectory. That conclusion holds within couples and also comparing mothers with fathers more generally.[1] There is also evidence that the possibility of motherhood impacts career choice and educational investment, and also that the career cost of children influences the timing of the first birth.[2]

Much of the initial divergence between male and female earnings after a birth is due to the reduction in the hours of paid work of mothers. But a cascading often follows. Fewer hours at work when young result in less lucrative clients, fewer published papers, a lower probability of promotion, and reduced odds of making partner or obtaining tenure, to provide a few examples for the higher-end group.[3] In addition, with fewer fully-active years of experience, even a static human capital model would predict lower future earnings.

Thus, career trajectories between mothers and fathers, and between women with and without children, diverge. Gender differences in earnings widen for some time after a

[1] Angelov, Johansson, and Lindahl (2016) use administrative data from Sweden on couples. Other careful event study estimates of the impact of childbirth on female labor supply and the gender gap in earnings include Kleven, Landais, and Søgaard (2019), who use administrative data from Denmark, and Kleven, Landais, Posch, Steinhauer, and Zweimüller (2019) using a similar methodology for several countries. Cortés and Pan (2020) use Kleven's methodology and the PSID to track the gender gap in earnings for cohorts having a first birth from the mid-1970s to the 2010s. Kuziemko et al. (2020) also use the method to shed light on whether women anticipate the career costs of children. Juhn and McCue (2017) find substantial motherhood penalties using the PSID. Goldin and Mitchell (2017) use US administrative data and for evidence on the impact of births on labor force participation.

[2] Adda, Dustmann, and Stevens (2015), Wilde, Batchelder, and Ellwood (2010), and Herr (2015) all explore the role of birth timing on human capital investment, career choice, and earnings.

[3] On the critical role of early promotions, see Bronson and Thoursie (2020) who use Swedish data.

birth for human capital reasons as well as for those involving various forms of discrimination.[4] In addition, disproportionate demands on women's time relative to men's may continue long after the children are grown, and aging parents frequently add to caring demands that often fall on women.[5]

But, there is a moment when childcare demands lessen and women can assume greater career and workplace challenges and shift into the more demanding jobs and firms. One obvious change, observed in most data sets, is that mothers eventually increase their weekly hours of paid work. Even older female physicians (> 44 years), work more hours by medical specialty than their younger female colleagues, and often work more hours than their older male colleagues.[6]

We ask whether mothers earn more as a result of their increased work time, relative to men and relative to women who have not yet had children or will never have them. We use longitudinal data from the NLSY79 to understand what happens to the labor supply and earnings of mothers and fathers as their children grow and leave home or, at the very least, require less oversight. The data allow us to observe men and women born from 1957 to 1964 as they advance to their mid-fifties and, for parents, as their youngest child graduates from high school.

Although considerable research has been done on the role of children in widening the gender earnings gap and slowing women's careers, there is little on what happens when children grow up. One of the reasons for the limited research on the topic is that longitudinal datasets for the US, such as the NLSY79, have not covered a long enough time period, until recently.[7]

The NLSY79 Sample

The NLSY79 (US Department of Labor, BLS 2019) is an extraordinary longitudinal

[4] Other reasons for the so-called "motherhood penalty," are both overt and unintentional discrimination by employers, managers, and supervisors. Mothers could be deliberately and discriminatorily passed over for promotions, or their direct supervisors could be guilty of a form of paternalism that serves to protect the individual but actually harms them.
[5] Fahle and McGarry (2018) document relationships between caregiving and women's employment using data from the Health and Retirement Study (HRS). Shen (2021) finds that Medicaid policies facilitating formal paid home care led to an increase in daughters' hours of paid work.
[6] These findings are from the Community Tracking Survey (restricted use version). Female physicians younger than 45 years old work ten fewer hours per week than same-age male physicians (no information is provided on presence of children). But female physicians work just five hours less when they are 45 years and older.
[7] Several researchers have used earlier waves of the NLSY79 to explore similar issues, including Wilde, Batchelder, and Ellwood (2010) and Herr (2015).

sample now in its forty-third year.[8] It began in 1979 with around 13,000 14- to 22-year old male and female respondents born from 1957 to 1964. These respondents have been followed until today, with some attrition and sample changes.

To have as complete a work history as possible, we employ a (fairly) balanced panel of individuals whose last interview was 2018. We separately analyze data for those who earned a four-year college degree by age 35 and for those who did not, but who achieved at least a high school degree (or its equivalent) by that age. Male and female respondents are included even if they never become parents for the duration of the longitudinal sample.

Our college graduate sample includes 42,880 person-year observations for those aged 25 to 59 at some point in the survey; 22,297 are for women. The sample has 1,321 individuals (683 women and 638 men). Our non-college graduate sample includes 143,556 person-year observations for those aged 20 to 59, of which 73,448 are for women. The non-college graduate sample has 4,059 individuals (2,103 women and 1,956 men). College graduates are about a quarter of the sample individuals.

We begin using their work histories when respondents had worked at least 20 hours per week on average for 26 weeks per year during two consecutive years. They remain in the sample if they are equivalently employed for at least 20% of the time remaining to 2018. Using these sample restrictions reduces the college graduate sample by 7% for women and 2% for men and shrinks the non-college graduate sample by 10% for women and about 5% for men.[9]

Given the sample selection criteria, the total number of person-year observations in the college graduate regression sample is 36,458, of which 17,741 are for women. The sample has 1,260 individuals (635 women and 625 men). About 72% of the college graduate women had at least one birth by the end of our sample and the median age of their first birth was 29 years.[10] Almost 76% of the college graduate men became fathers in the duration of the survey and their median age at the birth of their first child was 31 years.

[8] The full name of the survey is National Longitudinal Survey of Youth 1979. See U.S. Department of Labor, Bureau of Labor Statistics (2019).
[9] We also truncate hours of paid employment at 84 per week and remove observations for which annual earnings are less than half the contemporaneous federal minimum wage for full-time workers. Further details about data construction can be found in Appendix 2.
[10] Aggregate data from the CPS June Fertility Supplements have a somewhat higher fraction of college graduate women with at least one birth (74% for those born in 1958 increasing to 76% for those born in 1964). There may be selective attrition in the NLSY79 data or these differences may be due to sampling error.

Similarly, for the non-college graduate group, the regression sample contains 107,912 person years, of which 51,600 are for women. That sample has 3,742 unique individuals (1,885 women and 1,857 men). About 85% of women with no college degree had at least one birth by the end of our sample and the median age of their first birth was 23 years. Almost 78% of the no college degree men became fathers in the duration of the survey and their median age at the birth of their first child was 26 years.

Evidence on Labor Supply and Gender Earnings Gaps from the NLSY79

We motivate our paper with Figure 1. Part A is derived from a simple OLS regression of log(annual earnings) for each of the two education groups with log(hours) and log(weeks worked) included as covariates.[11] Males and females are pooled and the graph gives the coefficients from the interaction of the age groups and gender, plus the constant term on female.[12]

Several features are clear from the graph. The gender gap in earnings is initially larger for those without a college degree than for those with a college degree. But college graduate women quickly lose out relative to college graduate men, and by their early forties, the college graduate gender earnings gap is greater than for those without a college degree. The two lines giving the gender earnings gap for each of the education groups cross around age 42. Another important point is that the earnings gap, even correcting for hours and weeks worked, is substantial for both education groups, particularly beyond their late thirties.

The figure summarizes the findings of many other researchers who find that when highly-educated women begin their employment they earn amounts that are close to those of their male colleagues, friends, and even spouses. But they lose out considerably with time especially after having children and also as the higher-educated men are able to earn substantial salaries. Less-educated women, however, start out in jobs that pay much less relative to the men in their education group, but they don't lose out as much since male earnings do not increase much with age.

We also present, in Part B, results using an individual fixed-effects estimation.[13] The fixed-effects estimates produce somewhat larger gender earnings gaps. The reason we will

[11] A related analysis using synthetic cohorts is in Goldin (2014); see also Juhn and McCue (2017), who construct approximately the same synthetic cohort analysis.
[12] The unemployment rate in each year is included since year fixed effects cannot due to the small number of cohorts. There are no controls included for children.
[13] Only the college graduate group is given since results for the non-college graduates are similar.

see, is that women with children are apparently disproportionately selected from among those with higher earnings.

We use these insights as a jumping off point to investigate the role of children in the gender earnings gap and how differences in earnings between mothers and non-mothers and between mothers and fathers evolve as the children grow up. Our contribution is to understand what parts of the gender gap in earnings across the lifecycle are due to family formation and what parts are due to differences between men and women regardless of childbearing.

The samples for all regressions are the same and are pooled, containing both males and females. Because the regressions are highly saturated there are only minor differences in the coefficients of interest from those in identical regressions estimated separately by gender. In all cases we use a variant of eq. (1) where y_{it} is an outcome, such as log annual income or average weekly hours, for individual *i* in year *t*.

$$(1) \quad y_{it} = \phi_0 + \phi_1 F_i + \phi_2 A'_{it} + \phi_3 (A'_{it} \cdot F_i) + \alpha_1(\mathbb{K}'_{it}) + \alpha_2(\mathbb{K}'_{it} \cdot F_i) + \delta \cdot \mathbb{Z}'_{it} + \gamma \cdot \mathbb{X}'_{it} + \psi U_t + \varepsilon_{it}$$

Included in all OLS estimations are: a female dummy (F_i); a vector of five-year age groupings (A'_{it}) and their interaction with the female dummy, ($A'_{it} \cdot F_i$). Also included are a vector of child variables ($\mathbb{K}'_{it}$), that contains the total number of (biological) children born up to that year, and the relevant child age bin of the youngest child at that point (0<3; 3<6; 6<12; 12<18; 18 plus). The child age bins reflect a variety of milestones that impact childcare (e.g., end of diapers; entrance to elementary school; high school graduation).[14] Child variables are also interacted with female ($\mathbb{K}'_{it} \cdot F_i$).

In some regressions, we also include a vector of time variables, ($\mathbb{Z}'_{it}$), hours and weeks (in logs). In some, we also add a measure of work experience and in the same regression we include whether the individual earned an advanced degree above the bachelor's, for the college graduate sample.[15] The experience and advanced degree variables are in the vector $\mathbb{X}'_{it}$. In all regressions, we add the national unemployment rate (U_t) in year *t* to account for the impact of the macroeconomy. Due to the limited number of cohorts in the NLSY79, we cannot include year effects because of collinearity among cohort,

[14] We use only biological children because of the difficulty of determining the precise birth year of adopted children.

[15] Experience is defined as the fraction of the past five years that the individual was employed for fewer than 20 hours per week on average per year. Advanced degrees, for the college graduate group, include all above the bachelor's (e.g., MDs, JDs, MBAs) earned to that year.

age, and year.

All earnings regressions are estimated as both cross sections (OLS) and with individual fixed effects. For the OLS regressions, the error term (ε_{it}) is assumed to be i.i.d. The fixed effects estimations use the same variables as in the OLS, except that the female dummy is dropped and the error term is $\varepsilon_{it} = \nu_i + \epsilon_{it}$, where ϵ_{it} is assumed to be i.i.d. We will emphasize the individual fixed effects results.[16]

Changes in Labor Supply: Weeks and Hours Worked

Many previous researchers have discovered that the role of children in impacting women's earnings across the lifecycle, and thus the gender gap in earnings, is largely determined by changes in labor supply. In particular, hours of work decrease after a birth and stay low for some time. Weeks per year, a measure of labor force participation, also decrease, but the primary labor supply response is at the intensive margin of hours.

We estimate two regressions to understand lifecycle labor supply. The first is the number of weeks worked in the year, and the other is weekly hours, excluding zeros. Cols. (1) and (2) of Tables 1a (for college graduates) and 1b (for non-college graduates) use the data in cross section (OLS) and cols. (3) and (4) use individual fixed effects. We will mainly comment on results for the college graduate group, unless those for the non-college sample are sufficiently different.

Women whose youngest was an infant or toddler (0 to 2 years) worked about 3.5 fewer weeks per year than did fathers of those children.[17] In consequence, women work a lower fraction of the year when their children are young. But, as the children get out of diapers, into pre-school, and then to the elementary grades, these differences quickly decline in all estimations.

Larger and more persistent labor supply responses occur at the intensive margin of hours, especially when there are young children. The impact of children on hours of work can be seen in a simulation that uses the family structure of the average parents in the data for each age group (Appendix Table 1 has the mean number of children by child age and

[16] We do not use the event study framework in Kleven, Landais, and Søgaard (2019) and Kleven and Landais (2017). Because our time frame is long, we would clearly violate a key assumption of that framework, that women who have their first child at an early age and those who have their first later do not differ in unobservable ways.

[17] The computation uses Table 1a and assumes that a 25-29 year old college graduate mother has one child (OLS: –3.3 = [–0.0727 – 0.116 – 3.11]; fixed effects: –3.85 = [0.036 + 0.171 – 4.06]). Fathers work slightly more weeks per year when their children are the youngest, given parent age; mothers work the fewest weeks at that stage.

parent age groups). We compare the impact of children on mothers' work time relative to women who have had no children by that age. We also compare mothers to fathers. In the simulation, we follow individuals as they advance through the seven age groups for the college graduates (from 25-29 to 55-59) and the eight for the non-college graduates (from 20-24 to 55-59).

Relative to college graduate women without children, as can be seen in Figure 2a, part A, mothers reduce their weekly hours by about seven—or about one day a week—from their late twenties to late thirties. When they are in their early forties, and their youngest is already in elementary school (79% of those mothers have a youngest child older than six years) the difference is reduced to around five hours, and is diminished further to about two hours when they are in their early fifties and the youngest has graduated high school (60% have a youngest older than 17 years). In the oldest age group, the difference between mothers and non-mothers is fewer than two hours.

Differences in hours worked between mothers and non-mothers are considerably less in the non-college graduate sample. For that group, given in Figure 2b, part A, the initial difference of just four hours is reduced to virtually zero by their late forties, and point estimates suggest that mothers in their fifties actually work a bit more than non-mothers.

The comparison in Figure 2a, part B with college graduate fathers shows a greater relative deficit for mothers than the comparison with college graduate non-mothers and some ramping up later. Mothers work about ten fewer hours than do fathers when most have a youngest still in pre-school (30 to 39 years), and around eight fewer when the youngest is predominantly in middle and high school (45 to 49 years). When mothers are in their early fifties, they still work almost six fewer hours than fathers. Of that difference, around four hours are due to the fact that women work less than men. That difference can be seen by computing hours differences in part A between mothers and non-mothers, since hours of college-graduate fathers are about the same as those of non-fathers in the fixed effects estimation.[18]

For the non-college group, the initial difference in hours relative to fathers is somewhat less (around eight hours) than for college graduates and there is little change as the children grow up. The difference is more than six hours, even when more than 80% have a youngest child who is older than 17 years and the women are in their late fifties.

Why women who are not mothers or not yet mothers work fewer hours than do

[18] In the OLS results, men with children put in more paid work hours, but a bit less by the age of the youngest child.

fathers, may have something to do with other care responsibilities for families members or the home, planning for a family, or a host of other preferences regarding labor supply. Note that the hours differences are generally somewhat larger in the fixed-effects estimations.

The main point from either estimation, is that hours of paid work initially plummet with motherhood, an effect that is larger for the college graduate group. Hours stay lower for mothers than non-mothers in the college graduate group but increase as the youngest child begins school and eventually exits high school. Hours for mothers in the non-college graduate group become virtually identical to non-mothers. Since hours exclude the zeros, one can also add in the impact from zero weeks worked during the year, although that will be small relative to the hours decline conditional on working.

Mothers, therefore, do increase their work time as the children grow up but they are still far behind fathers. What all that means for the earnings of mothers relative to other women and in comparison with fathers are the next items to consider.

The Motherhood Effect and the Parental Gender Gap in Earnings over the Lifecycle

The OLS estimation of log annual earnings for the college graduates is given in Table 2a and the related individual fixed-effects estimation is in Table 3a. The non-college graduate group are similarly in Tables 2b and 3b.

The estimation of log(annual earnings) in col. (1) of each table includes the age group variables and their interaction with gender, as well as the main gender effect in the cross-section estimation. Col. (2) adds the time dimension (weeks and hours in logs). Col. (3) excludes time but adds the child effects in the same manner as in the labor supply regressions of Table 1. Col. (4) adds back in the time dimension (hours and weeks in logs), and, finally, col. (5) includes a measure of low- or no-work experience and whether the college graduate respondent earned a degree beyond the bachelor's.[19]

Figure 3 gives the impact of children on mothers relative to non-mothers for the three main models that include the child variables: without the time variables, with the time variables, and with time, experience, and further degrees.[20] Part A has the results for the college graduates and part B for the non-college graduates.

[19] Recall that low- or no-work experience is defined as the fraction of each of the previous five years that the individual worked an average of 20 hours or less per week. About 12% of college graduate women in their thirties and forties had low- or no-work experience in the previous five years.
[20] These are the results from the fixed-effects estimations in Table 3, cols. (3), (4), and (5).

These calculations give the pure motherhood effect (what we term the "motherhood penalty") by comparing the earnings of women with and without children, at that moment. We simulate the impact of children by using the actual number of children and their age distribution by the age of the mother, as we previously did for hours. The impact of the age of the youngest child and the total number of children as the mothers (and their youngest child) age is given by the bars (which are always in the negative range).

The immediate impact of children on earnings, through the channel of fewer hours and weeks, is clear by comparing the dark blue bars (not holding hours and weeks constant) with the light blue bars (holding the time variables constant). Decreased hours and weeks account for about a half of the difference in earnings of mothers relative to non-mothers in their early forties but somewhat less for the non-college graduate group whose hours were less impacted by motherhood.

The shaded bars add variables for the previous five years of low hours or non-work experience and the presence of an advanced degree, for the college graduates. Holding all of that constant, those with their youngest child mainly in the elementary-school ages (say mothers in their early forties) earn 13 log points less than women without children. By the time the youngest is out of high school (say mothers in their early fifties) differences diminish to about 8 log points. Differences between mothers and non-mothers become even less for the non-college graduates as the children grow up.

The dark blue bars show that mothers greatly narrow the earnings gap with women who have not yet had, or will never have, children. But that occurs, in part, because they increase their hours and partly compensate for lost job experience. One can clearly see that as the children get older and become more independent, college graduate mothers make up for lost time relative to other women. There is a distinct U-shaped relationship in Figure 3, part A between the age of the mother (thus the age of the youngest child) and the motherhood penalty. The earnings penalty to women from having children is large but declines.

As large as is the motherhood penalty for women with younger children, the parental gender gap in earnings is considerably greater and remains large. The parental gender gap, as we will soon see, is the motherhood penalty plus the price of being female (which is often termed the unexplained—by the included variables—gender wage residual) minus the premium to being a father.

Figure 4 gives the simulated impact of mothers' versus fathers' annual earnings, assuming, as we did before, that parents have children at the mean rate for women in the

sample.[21] The log earnings differences without the time variables (dark blue bars) are enormously large, bottoming out around the late thirties when parents have a pre-school and slightly older child. They vary less with age for the non-college graduates

The parental gender gap is less gargantuan, but still substantial in magnitude holding hours and weeks constant (light blue bars). When parents are in their late thirties to early forties, a college graduate mother earns less than 60 cents on a similar father's dollar ($e^{-0.58} = 0.56$). Adding the experience and advanced degree variables (shaded bars) increases her relative earnings but only slightly. The gains to having the youngest child graduate from high school are minimal.

As we saw earlier in Figure 1, non-college women eventually improve on equivalently-educated men and have a lower gender earnings gap relative to the college graduate group. But around their late thirties, the two groups of women earn about the same relative to men in their education group. That finding, not unexpectedly, is repeated in Figure 4 comparing parts A and B.

Given that hours of work greatly drop for women with young children, it is not surprising that the parental gender gap is enormously large when the children are young. But, the gap remains large even as the youngest child graduates from high school. Plus, even with the same number of contemporaneous hours and previous five years' work experience, as given by the shaded bars, mothers still earn considerably less than fathers.

The estimates allow us to partition the parental gender gap into three components: the motherhood penalty, the price of being female, and the fatherhood premium. Table 4 gives the results of the partition using the fixed effects estimates that include hours, weeks, previous five years' work experience, and advanced degrees for the college graduate group (Table 3a or 3b, col. 5).

Consider college graduate women and men at ages 35 to 39 years. Women with children earn 12 log points less than women without children. But a similar difference between mothers and fathers is 54 log points. What accounts for the 42 log point difference between the parental gender gap and the motherhood gap?

There are two primary factors that reveal the crux of why mothers earn far less than fathers. First, all women 35 to 39 years get 22.6 log points less than same age men.[22] The

[21] Note that in our simulations, the motherhood effect nets out the gender component because all are women. The gendered impact of parenthood differences the motherhood and fatherhood effects and includes the net impact of gender.

[22] The (recovered) college graduate female main effect (see Table 3a, col. 5) is –17.4 log points and, in addition, 35-39 year old women earn 5.31 log points less than the female base age group.

remainder (now in excess of 19 log points) comes from the fatherhood premium.[23] There may be astonishment at this finding. Not only do women lose earnings by their years of raising children, but men actually earn a premium. A curious finding, for future exploration, is the increased penalty after age fifty from being female (col. 3). Whether that is due to increased demands from aging parents is not clear. It is equally large for the non-college group but does not vary as much with age.[24]

The fatherhood premium is fairly constant across age groups for the non-college graduate group and considerably smaller after age 40. The parental gender gap in earnings is equivalently smaller.

There is a large and long-standing literature regarding the fatherhood premium and the male marriage premium. The literature has assessed whether fathers (or married men) earn more because they work harder after they have children (or get married) or, alternatively, whether they become fathers (or get married) when they are earning more. Another possibility is that various principals in the labor market (e.g., supervisors) reward fathers and married men more on the basis of their conception of fairness or their personal preference.

In one of the earliest research articles using an individual fixed effects framework to assess these hypotheses, Korenman and Neumark (1991), found that the earnings profiles of men steepen after marriage and that they receive higher performance ratings from their supervisors. Both findings suggest that men work harder after marriage and that the labor market may also favor them. Studies that followed concur with their conclusion that selection into marriage is less important than the treatment effect of marriage and also of fatherhood. But the jury, according to others, is still out.[25]

The impact of having children, however, is not necessarily the same as that from being married. Juhn and McCue (2017) find a fatherhood premium for US men, increasing for more recent cohorts. Their estimates are based on OLS regressions run on cross-

[23] The fatherhood premium among college graduates (see Table 3a, col. 5 and Appendix Table 1) is 13 log points (= 0.0677 × 1.93) for the number of children plus about 6.5 log points from the premium to having a youngest child of the various ages.

[24] We find that the gap increases by 4 log points for the three oldest age groups even among women who will never have a child.

[25] Killewald and Lundberg (2017) provide evidence that the relationship between marriage (and divorce) and earnings is not causal, but comes from unanticipated positive (and negative) shocks. Killewald and Gough (2013) show that even women and men without children earn a marriage premium. Killewald (2013), using the NLSY79, concludes that residential and married fathers have more interest in working for the betterment of their children, consistent with Korenman and Neumark (1991) but more nuanced.

sectional data. The main concern with OLS is that the fatherhood premium could stem from self-selection into parenting if men with the highest earnings potential were more likely to have children. Several studies for the US using longitudinal data and fixed effects models confirm these results. Lundberg and Rose (2000) find a fatherhood premium but only for couples where the wife reduces her hours of work after the birth of the first child. Budig (2014) and Killewald (2013) both find a fatherhood premium (using NLSY79 data), especially for married, co-resident, and biological fathers.[26]

The precise reasons for the positive relationship between men's earnings and fatherhood are important. No matter how rich the longitudinal data of the NLYS79 are, they do not allow us to disentangle exactly why fathers do so well. We know that it isn't due to the usual selection issues. But it could be one or more of the reasons offered in the previous literature.[27]

Among different sex couples, men are enabled to become fathers while continuing to advance in their careers because women disproportionately take care of the children. Mothers cut back on their hours, work less demanding jobs, and earn less. But something else must be operating because women without children do worse than men with children. For men, having the children and a wife who is the caregiver is related to their earnings boost. Whether it is causal or whether marriage and children result from some exogenous boost is secondary. Put simply: the motherhood penalty becomes very small as the children grow up, but the fatherhood advantage remains large and increases with age, especially among college graduates.

Exploring the Fatherhood Premium

We now explore the possibility that the size of the fatherhood premium, and its increase with age, come disproportionately from fathers with time-intensive jobs. In this analysis, we will focus our attention on college graduates. The fatherhood premium accounts for about 40% of the parental gender gap in earnings for the college graduate group. Although the fatherhood premium is substantial for non-college graduates, it is just 25% of the total gap. Another reason to focus on the college graduate group concerns the nature of the time-intensive occupations. These occupations tend to be found in sectors,

[26] See also Yu and Hara (2021) who, using the NLSY79, emphasize the firm as determining why fathers earn more and mothers less. A recent piece by Kunze (2020), using Norwegian data on twin brothers, finds that selection into fatherhood was far less important to their earnings than were other aspects of their backgrounds.

[27] We have, in addition, examined the impact on fathers of being currently married (or currently cohabitating) and thus presumably living with their children. We find that the fathers who get the biggest earnings boost are not those who are resident with their children, but the group is not large enough to be a major factor in our results.

such as in finance, law, and healthcare, that hire more highly-educated workers.

We code the time intensity of the occupations of our NLSY79 respondents when they were fairly young. In particular, we use the occupation they had immediately before they had their first child, if they ever had one. For those without children, we predict an age of a pseudo first birth and code the occupation of these individuals as we did for those who did have children. The idea is to use the occupation of respondents before they might have altered their time commitments to accommodate family demands. We can think of this as their preferred, somewhat unconstrained, occupational choice.

Our coding of the time intensity of the occupation is based on a combination of two measures. One is the fraction of individuals in that occupation working 45 or more hours a week as given in the 1990 Census. We chose the 1990 Census because it is the most relevant data given the year our respondents had their first birth. The other measure we use is an average of five O*NET characteristics that are designed to measure the lack of time flexibility, and thus the time intensity, in the occupation (Goldin 2014).

Time-intensive occupations are those meeting two criteria: (1) the fraction of workers in the 1990 Census working 45 or more hours per week is in the top third of all occupations for that criterion, and (2) the average of the five O*NET characteristics is also in the top third for that measure. Appendix 3 gives further details on the definition of time-intensive and not time-intensive occupations and the age of the respondents when they were employed in the occupation.

We estimate the parental gender gap in earnings in the same way we did in the previous section, but we now partition the sample by whether the individual had an occupation when younger that we deem time intensive. Among college graduates about 31.4% of the total sample had a time-intensive occupation.[28] We use the fixed-effects estimates that include all controls (similar to Table 3a. col. 5) and produce a partition of the parental gender gap into the three components, as we did before.

We show in Table 5, part A the results for those with time-intensive occupations and, in part B, for those in occupations that were not deemed time intensive. These results can be compared with the full group, given in Table 4, part A.

The differences in the partitions are striking. The fatherhood premium for the time intensive group is generally twice the size of that for the group that is not time intensive.

[28] Our college graduate regression sample with the time intensive occupation measure has 1,207 unique individuals or just 53 fewer than the full sample. Of the 609 women, 141 are in the time-intensive group. Of the 598 men, 238 are in the time-intensive group.

The fatherhood premium for college graduates in the not time-intensive group is the same as for non-college men (Table 4, part B). The price of being female (essentially the residual) is substantially smaller at older ages for the time-intensive group, and the motherhood penalty is larger. The full parental gender gap in earnings is not much different.

It would appear that men who had time-intensive occupations when younger were enabled or motivated to work even harder when they had children than were men who were not fathers. There are many possible reasons.

Having children may motivate them to worker harder. Their stay-at-home or working part-time wives may further enable fathers to focus on their careers (by easing time constraints or offering advice and motivation). Irrespective of the reasons why fathers work harder, time-intensive occupations have highly non-linear earnings with respect to hours worked (Goldin, 2014). The extra effort of these men in the twenties and thirties appears to be disproportionately rewarded through promotions and other career opportunities that later produce higher earnings.

The same advantage was not available to men who were not in the time-intensive occupation group.[29] These men may increase their hours when they have children relative to non-fathers, but they are in occupations with flatter wage-age profiles with less scope for earnings to grow dynamically through promotions and job-hopping.

Summary

An important and immediate conclusion from our work is that women's earnings take a sharp nose-dive directly after the birth of a child. The decrease is mainly, but not entirely, due to a reduction in hours of work. Diminished earnings, moreover, remain for at least a decade. That part is known from many excellent and well-identified studies.

Our contribution has been to add many more years of parenthood and life, and analyze the impact of children as they mature and become more independent. As the youngest enters grade school and beyond, women's hours increase relative to those of non-mothers and to those of fathers.

[29] These results are not for couples. We have assembled data on couple earnings and occupations in the NLSY79 and find that the parental gender earnings gap for the college educated is highest in families where the husband is in a time-intensive occupation, irrespective of the time intensity of the wife's occupation. The parental gap is the lowest, for all education groups, in families with both (different sex) members of the couple in not-time-intensive occupations, as we have defined that term.

Mothers narrow the earnings gap with regard to women who have not yet had, or will never have, children. College graduate women with children gain 18 log points (0.31 – 0.13) relative to those without children as they move from their late thirties to their late fifties, using the estimation that does not have the time variables. They gain 8 log points (0.18 – 0.10) controlling for hours.[30] They would earn 16 log points more relative to fathers if they could work the same hours and weeks as the fathers, but they don't advance on fathers given hours and weeks. They just hold their relative place.[31] Whether the gains, when they do occur, are due to changes in occupations or firms that increase the intensity of work is not revealed in these data but is a topic on which we are currently working.

We began with the notion that life is an adventure, a long hike with difficult ascents. Parenthood is part of the steep climb during which mothers slow down, reduce their hours of work, and occasionally leave employment for some time or shift into less time-intensive jobs and firms. But there is a moment when childcare demands greatly lessen and women can increase their hours of paid work and assume greater career challenges. We can think of that moment, metaphorically, as when mothers reach a summit and then run down the other side of the mountain. But even though they increase their hours of work, they never reach the rich valley of gender equality. In large measure, their inability to earn the same as fathers is due to the positive relationship that children have with the earnings of men and their negative relationship with women's.

[30] The estimate of 0.31 is from Figure 3, part A for 35-39 year old college graduate mothers relative to non-mothers. That of 0.13 is for 55-59 year olds. Both use the regression with no time variables. Using the regression with time variables, but not experience and advanced degrees, gives 0.18 for 35-39 year olds and 0.10 for 55-59 year olds.

[31] At age 40-44 college graduate mothers earn -0.789 relative to college graduate fathers in the estimation without time variables and -0.630 with time variables. Therefore, 16 log points = (0.789 – 0.630) is the amount mothers get for working the same number of hours and weeks. But the gender earnings gap between mothers and fathers computed with time variables does not change much with age after 40-44. See Figure 4, part A.

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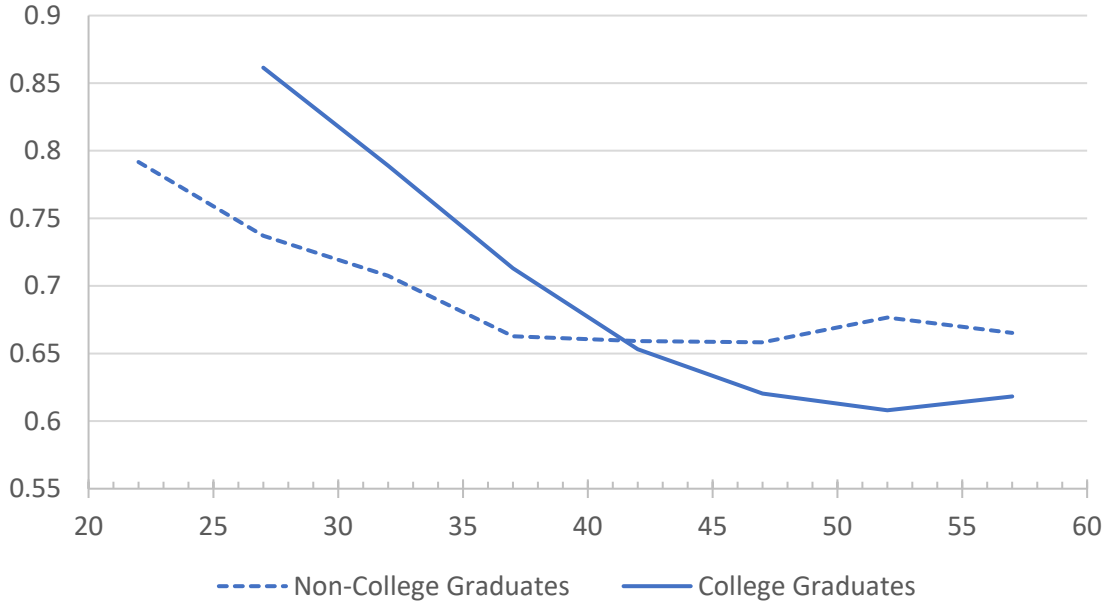
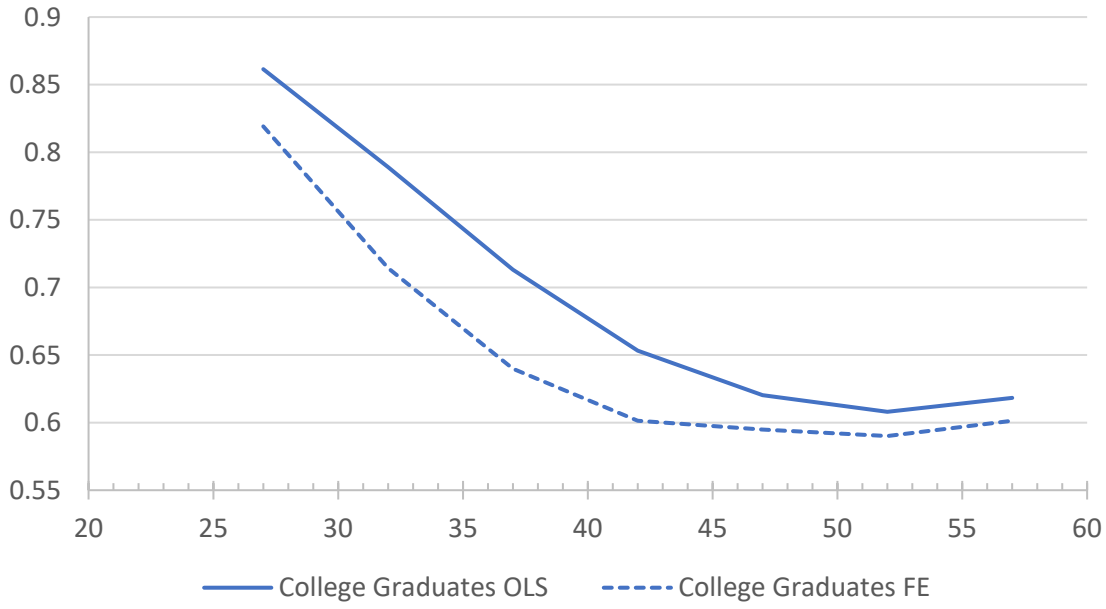
Figure 1: Relative Annual Earnings of Men and Women by Education Level: Cohorts Born 1957 to 1964

Part A: OLS Estimation for the Gender Earnings Gap



Part B: OLS and Individual Fixed Effects Estimation for the Gender Earnings Gap

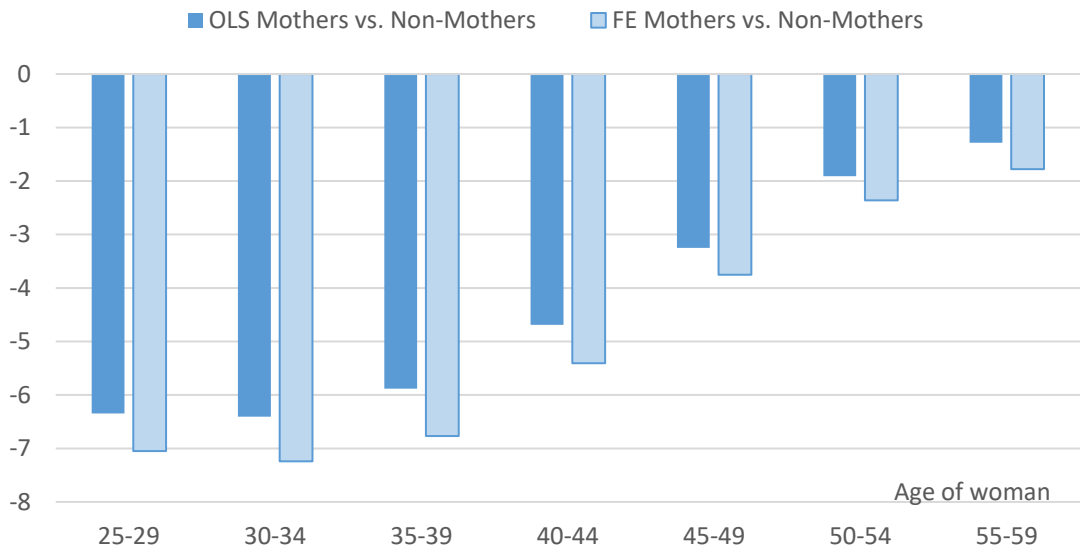


Sources: Part A: Tables 2a, 2b col. (2). Part B: Table 2a for OLS and 3a for individual fixed effects, col. (2)

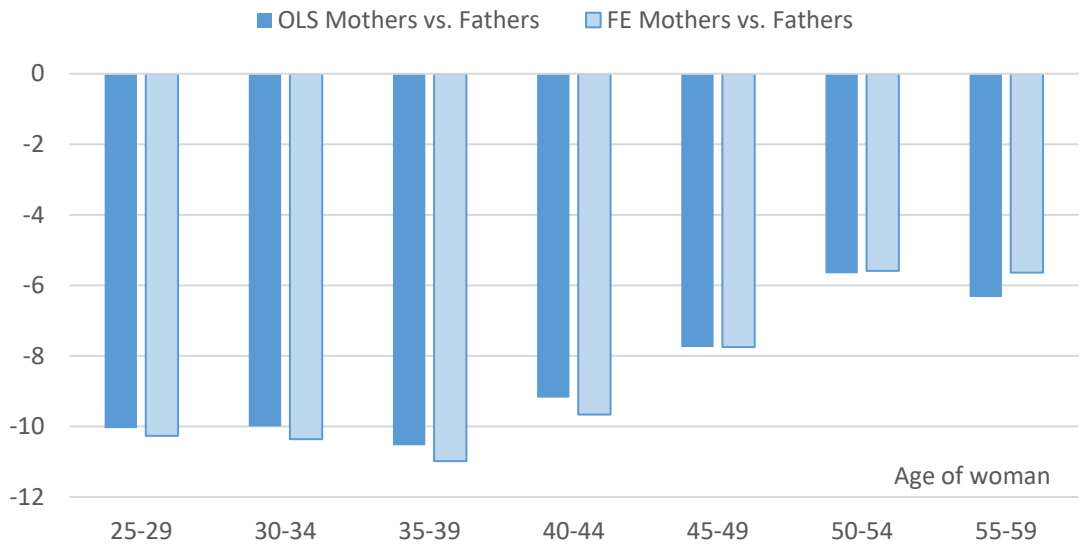
Notes: Log(hours) and log(weeks) are held constant.

Figure 2a: Simulated Impact of Children on Hours of Mothers' Paid Work: College Graduates

A. Impact of Children on Hours of Paid Work for Mothers Relative to Non-Mothers



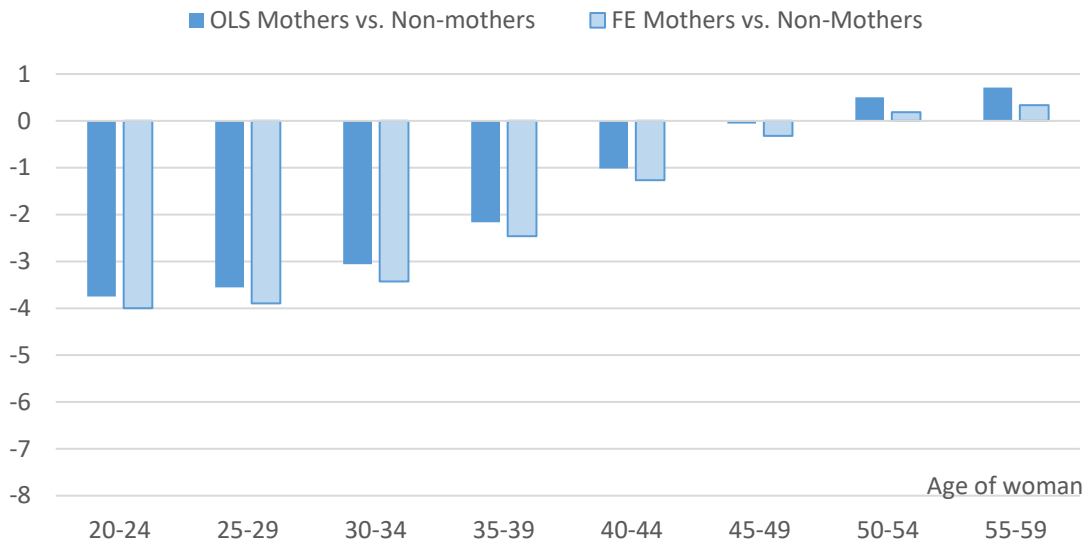
B. Impact of Children (and Female) on Hours of Paid Work for Mothers Relative to Fathers



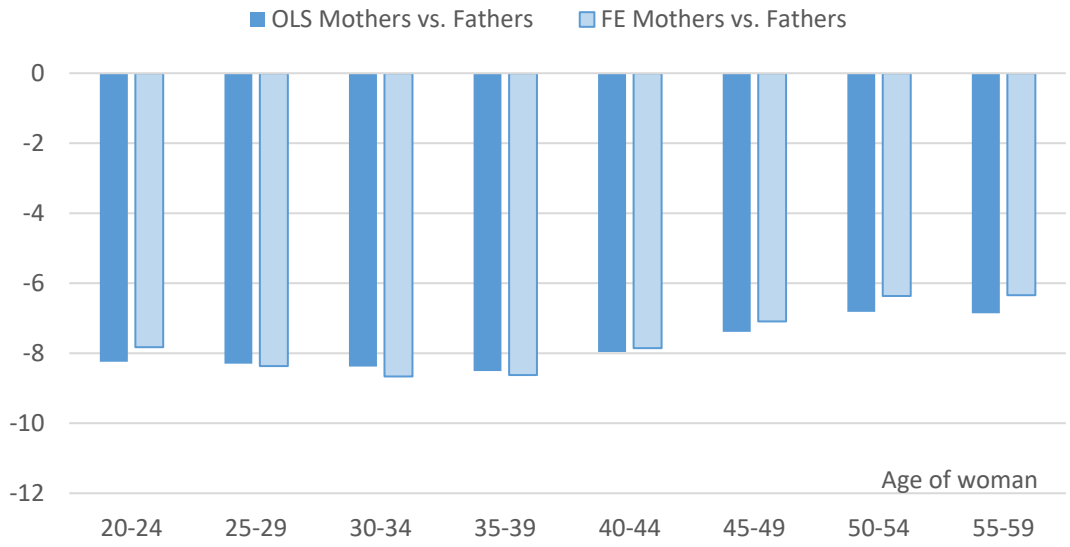
Source: Table 1a, col. (2), OLS, and col. (4), individual fixed-effects.
Notes: The simulation uses the mean number and age distribution of children by age of the mother. See Appendix Table 1, Part A. Respondents are all college graduates (or would be by age 35). In panel A, the only effect is that of the children since all are women. In panel B, the difference between mothers and fathers is due to the number and ages of the children, plus the interaction of respondent's age with female and the female main effect.

Figure 2b: Simulated Impact of Children on Hours of Mothers' Paid Work: Non-College Graduates

A. Impact of Children on Hours of Paid Work for Mothers Relative to Non-Mothers



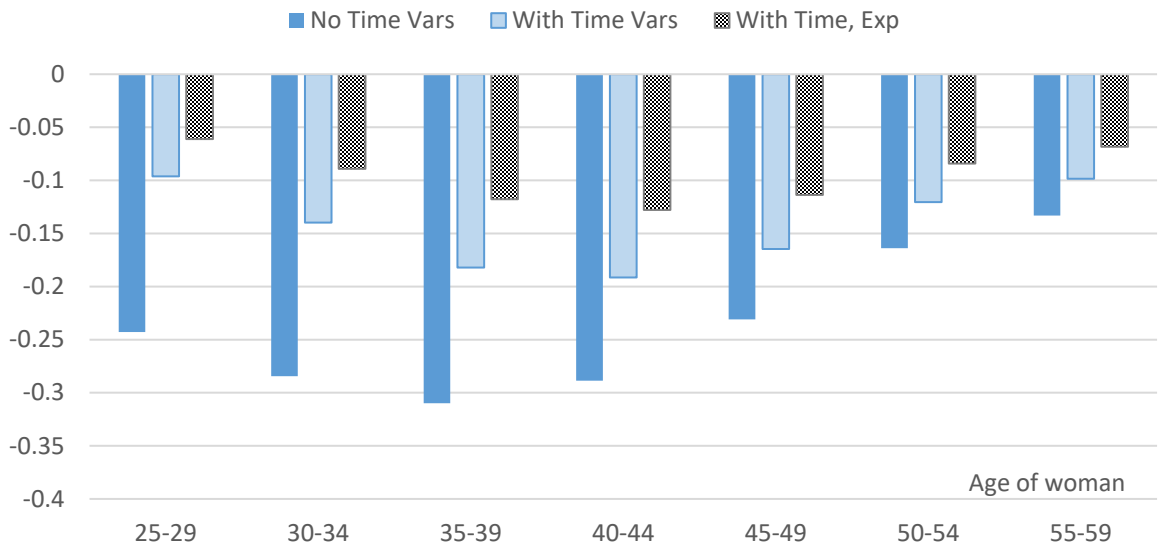
B. Impact of Children (and Female) on Hours of Paid Work for Mothers Relative to Fathers



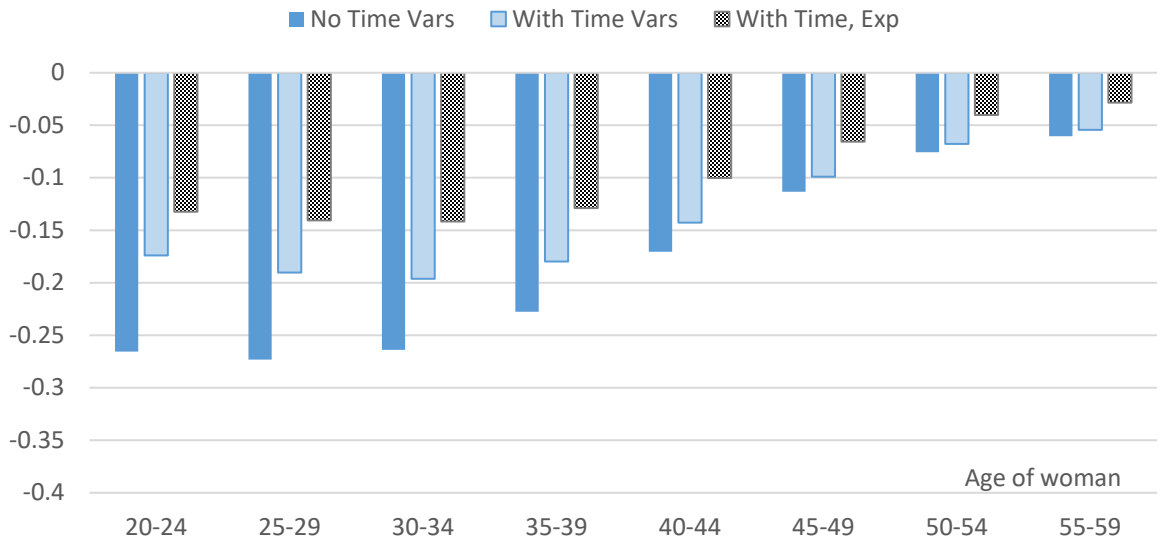
Source: Table 1b, col. (2), OLS), and col. (4), individual fixed-effects.
Notes: The simulation uses the mean number and age distribution of children by age of the mother. See Appendix Table 1, Part B. Respondents are non-college graduates (by age 35). In panel A, the only effect is that of the children since all are women. In panel B, the difference between mothers and fathers is due to the number and ages of the children, plus the interaction of respondent's age with female and the female main effect.

Figure 3: Simulated Impact of Children on Earnings of Mothers Relative to Non-Mothers: Individual Fixed Effects Estimation

Part A: College Graduates



Part B: Non-College Graduates

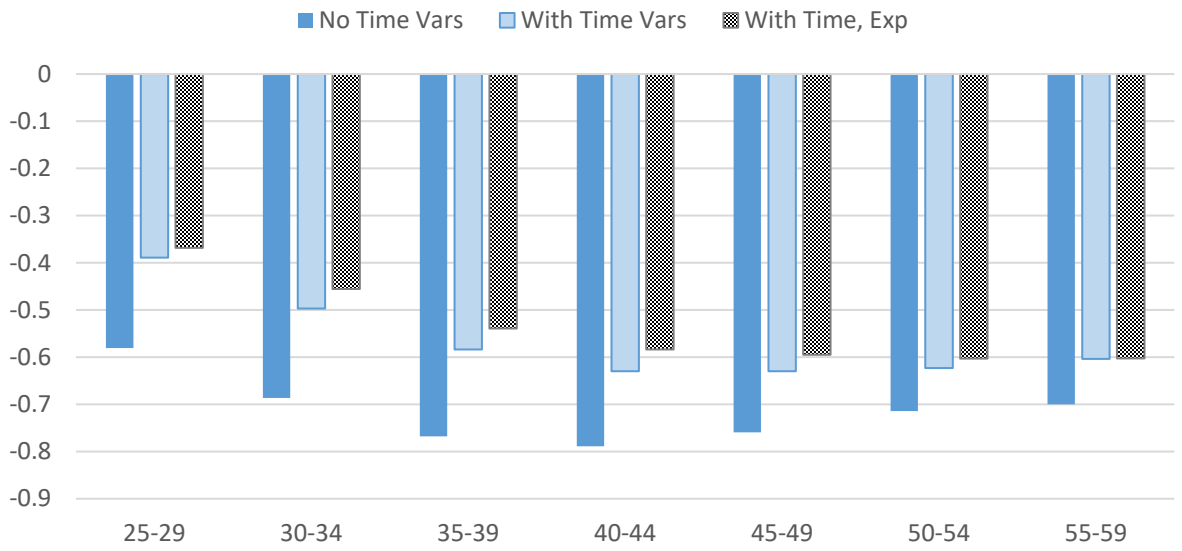


Sources: Table 3a, 3b, no time variables from col. (3); with hours and weeks variables, col. (4); with time variables, experience, and advanced degrees (for college graduates), col. (5).

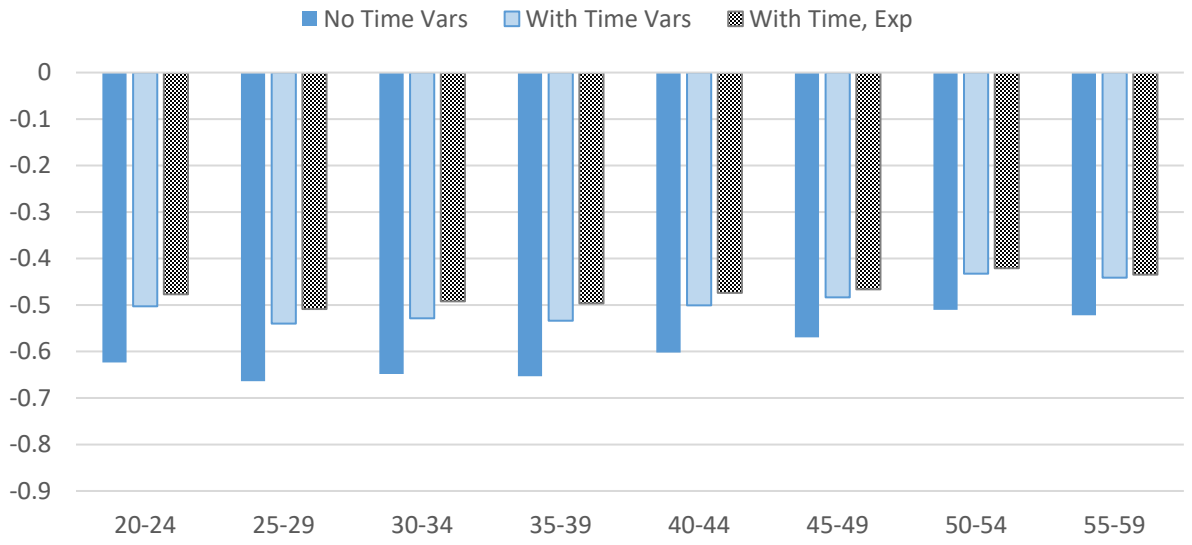
Notes: Time variables are log hours and log weeks. Experience is the fraction of the last five years that the individual worked > 20 hours per week on average. The simulation uses the mean number and age distribution of children by age of the mother. See Appendix Table 1, Parts A and B.

Figure 4: Parental Gender Gap in Earnings: Simulated Impact of Children on Earnings of Mothers Relative to Fathers

Part A: College Graduates



Part B: Non-College Graduates



Sources: Tables 3a and 3b, individual fixed effects, cols. (3), (4), and (5).

Notes: See Figures 3a and 3b. The simulation uses the mean number and age distribution of children by age of the mother. See Appendix Table 1, Parts A and B.

Table 1a: Weeks Worked and Weekly Hours: College Graduates

	OLS		Individual Fixed Effects	
	(1) # Weeks Worked	(2) Weekly Hours (non-zero)	(3) # Weeks Worked	(4) Weekly Hours (non-zero)
Female [a]	-0.0727	-2.709***	0.036	-3.141
	(0.251)	(0.311)		
Age Groups				
30-34	1.221***	1.786***	1.340***	2.169***
	(0.220)	(0.321)	(0.264)	(0.385)
35-39	1.996***	2.178***	2.209***	2.874***
	(0.211)	(0.356)	(0.290)	(0.474)
40-44	1.802***	1.053***	2.063***	2.020***
	(0.222)	(0.356)	(0.349)	(0.566)
45-49	2.066***	1.008***	2.324***	1.994***
	(0.223)	(0.371)	(0.374)	(0.663)
50-54	2.071***	0.426	2.442***	1.613**
	(0.236)	(0.397)	(0.409)	(0.747)
55-59	1.218***	-0.436	1.643***	0.520
	(0.277)	(0.500)	(0.477)	(0.861)
F × Age Groups				
F × 30-34	0.0617	0.575	-0.0172	0.165
	(0.323)	(0.452)	(0.395)	(0.594)
F × 35-39	0.189	0.0389	0.0421	-0.702
	(0.311)	(0.504)	(0.447)	(0.765)
F × 40-44	-0.255	0.538	-0.456	-0.553
	(0.332)	(0.495)	(0.518)	(0.825)
F × 45-49	-0.448	0.734	-0.678	-0.302
	(0.336)	(0.514)	(0.568)	(0.946)
F × 50-54	-0.0395	1.754***	-0.564	0.530
	(0.341)	(0.562)	(0.589)	(1.056)
F × 55-59	0.0754	0.714	-0.526	0.0209
	(0.403)	(0.713)	(0.687)	(1.223)
Children (age of youngest)				
# children	-0.00211	1.307***	-0.104	0.0794
	(0.0768)	(0.148)	(0.203)	(0.321)
Ch 0<3	1.094***	-0.763*	0.980**	-0.0834
	(0.219)	(0.397)	(0.384)	(0.664)
Ch 3<6	0.841***	-0.892**	0.781*	-0.0906
	(0.236)	(0.444)	(0.437)	(0.716)
Ch 6<12	0.635***	-0.0987	0.487	0.746
	(0.223)	(0.430)	(0.476)	(0.817)
Ch 12<18	0.591***	-0.400	0.294	0.119
	(0.218)	(0.429)	(0.515)	(0.864)
Ch 18+	0.218	0.361	-0.219	0.625
	(0.222)	(0.458)	(0.544)	(0.947)

F × children				
F × # children	-0.116	-2.357***	0.171	-1.362**
	(0.143)	(0.245)	(0.359)	(0.588)
F × Ch 0<3	-3.111***	-4.506***	-4.062***	-5.507***
	(0.403)	(0.614)	(0.718)	(1.160)
F × Ch 3<6	-0.754*	-3.452***	-1.793**	-5.071***
	(0.402)	(0.701)	(0.772)	(1.224)
F × Ch 6<12	-0.765**	-2.828***	-1.568*	-3.985***
	(0.381)	(0.658)	(0.808)	(1.349)
F × Ch 12<18	-0.498	-0.399	-0.937	-0.737
	(0.381)	(0.668)	(0.860)	(1.450)
F × Ch 18+	-0.279	0.820	-0.506	0.537
	(0.380)	(0.693)	(0.901)	(1.577)
Unemployment rate in year *t*	-0.0282	-0.0934*	-0.0375	-0.112**
	(0.0286)	(0.0505)	(0.0318)	(0.0518)
Constant	48.73***	45.35***	48.91***	44.66***
	(0.256)	(0.393)	(0.261)	(0.412)
Observations	36,458	36,458	36,458	36,458
R-squared	0.024	0.091	0.021	0.031
# Individuals			1,260	1,260

[a] The female main effects in the fixed-effects estimation were recovered.

Source: NSLY79 (U.S. Department of Labor, Bureau of Labor Statistics, 2019.) For sample description, see text.
Notes: Omitted age group is 25-29 years. For other variable definitions and sample selection details, see notes to Table 2.

Table 1b: Weeks Worked and Weekly Hours: For Non-College Graduates

	OLS		Individual Fixed Effects	
	(1) # Weeks Worked	(2) Weekly Hours (non-zero)	(3) # Weeks Worked	(4) Weekly Hours (non-zero)
Female [a]	0.983***	-3.748***	0.9150	-3.3500
	(0.183)	(0.208)		
Age Groups				
25-29	0.798***	1.208***	0.999***	1.563***
	(0.172)	(0.213)	(0.197)	(0.269)
30-34	1.437***	1.904***	1.679***	2.451***
	(0.173)	(0.227)	(0.228)	(0.346)
35-39	2.486***	2.406***	2.624***	3.016***
	(0.171)	(0.263)	(0.252)	(0.446)
40-44	2.478***	1.872***	2.587***	2.557***
	(0.177)	(0.265)	(0.270)	(0.487)
45-49	2.495***	1.165***	2.618***	1.979***
	(0.183)	(0.262)	(0.290)	(0.515)
50-54	2.806***	0.709***	2.815***	1.546***
	(0.181)	(0.274)	(0.303)	(0.564)
55-59	2.122***	-0.138	1.959***	0.821
	(0.217)	(0.348)	(0.346)	(0.646)
F × Age Groups				
F × 25-29	-0.327	-0.104	-0.450	-0.625
	(0.250)	(0.285)	(0.280)	(0.383)
F × 30-34	-0.293	-0.520*	-0.506	-1.360***
	(0.251)	(0.311)	(0.334)	(0.502)
F × 35-39	-0.754***	-1.324***	-1.010***	-2.181***
	(0.247)	(0.352)	(0.359)	(0.657)
F × 40-44	-0.566**	-1.562***	-0.904**	-2.382***
	(0.249)	(0.356)	(0.385)	(0.711)
F × 45-49	-0.316	-1.559***	-0.766*	-2.316***
	(0.265)	(0.369)	(0.409)	(0.754)
F × 50-54	-0.386	-1.269***	-0.860*	-1.927**
	(0.269)	(0.391)	(0.440)	(0.828)
F × 55-59	-0.329	-1.367***	-0.742	-1.973**
	(0.315)	(0.485)	(0.482)	(0.932)
Children (age of youngest)				
# children	-0.0889	0.649***	-0.0892	0.219
	(0.0554)	(0.0982)	(0.134)	(0.265)
Ch 0<3	0.620***	-0.00890	0.297	0.244
	(0.167)	(0.257)	(0.261)	(0.473)
Ch 3<6	0.326*	-0.250	0.0359	0.147
	(0.180)	(0.279)	(0.294)	(0.511)
Ch 6<12	0.502***	-0.402	0.168	-0.104
	(0.161)	(0.274)	(0.301)	(0.577)

Ch 12<18	0.442***	0.365	0.0194	0.497
	(0.165)	(0.294)	(0.314)	(0.614)
Ch 18+	0.426***	1.077***	0.0182	0.900
	(0.164)	(0.293)	(0.349)	(0.710)
F × children				
F × # children	0.0587	-1.043***	0.419**	-0.967**
	(0.0865)	(0.134)	(0.207)	(0.385)
F × Ch 0<3	-4.481***	-3.608***	-5.196***	-3.570***
	(0.288)	(0.368)	(0.437)	(0.691)
F × Ch 3<6	-1.166***	-2.494***	-1.779***	-2.885***
	(0.277)	(0.395)	(0.440)	(0.726)
F × Ch 6<12	-1.212***	-1.438***	-1.613***	-1.300
	(0.250)	(0.381)	(0.463)	(0.808)
F × Ch 12<18	-0.994***	0.139	-1.212**	0.698
	(0.252)	(0.412)	(0.475)	(0.880)
F × Ch 18+	-1.284***	0.539	-1.396***	1.098
	(0.254)	(0.405)	(0.522)	(1.000)
Unemployment rate in year *t*	-0.0878***	-0.158***	-0.113***	-0.148***
	(0.0221)	(0.0321)	(0.0252)	(0.0339)
Constant	47.92***	45.01***	48.67***	43.33***
	(0.212)	(0.295)	(0.222)	(0.309)
Observations	107,912	107,912	107,912	107,912
R-squared	0.025	0.090	0.025	0.017
# Individuals			3,742	3,742

[a] The female main effects in the fixed-effects estimation were recovered.

Source: NSLY79 (U.S. Department of Labor, Bureau of Labor Statistics, 2019.) For sample description, see text.
Notes: Omitted age group is 20-24 years. For other variable definitions and sample selection details, see notes to Table 2.

Table 2a: Male and Female Pooled OLS Estimations of Log (Annual Earnings): College Graduates

	Log (Annual Earnings)				
	(1)	(2)	(3)	(4)	(5)
Female (F)	-0.241***	-0.149***	-0.163***	-0.118***	-0.143***
	(0.0184)	(0.0156)	(0.0189)	(0.0160)	(0.0158)
Age Groups					
30-34	0.332***	0.269***	0.252***	0.205***	0.179***
	(0.0183)	(0.0159)	(0.0186)	(0.0164)	(0.0159)
35-39	0.598***	0.509***	0.452***	0.392***	0.354***
	(0.0194)	(0.0175)	(0.0203)	(0.0185)	(0.0181)
40-44	0.750***	0.679***	0.572***	0.536***	0.487***
	(0.0204)	(0.0190)	(0.0220)	(0.0206)	(0.0201)
45-49	0.824***	0.740***	0.640***	0.594***	0.541***
	(0.0205)	(0.0185)	(0.0230)	(0.0214)	(0.0211)
50-54	0.870***	0.798***	0.706***	0.674***	0.613***
	(0.0214)	(0.0195)	(0.0252)	(0.0237)	(0.0234)
55-59	0.809***	0.769***	0.672***	0.671***	0.607***
	(0.0281)	(0.0265)	(0.0318)	(0.0301)	(0.0294)
F × Age Groups					
F × 30-34	-0.141***	-0.0879***	0.00561	-0.00302	0.00204
	(0.0266)	(0.0229)	(0.0268)	(0.0235)	(0.0230)
F × 35-39	-0.277***	-0.189***	-0.00373	-0.00273	-0.0100
	(0.0274)	(0.0242)	(0.0285)	(0.0258)	(0.0252)
F × 40-44	-0.352***	-0.277***	-0.0267	-0.0265	-0.0336
	(0.0292)	(0.0261)	(0.0313)	(0.0283)	(0.0278)
F × 45-49	-0.388***	-0.328***	-0.0676**	-0.0605**	-0.0633**
	(0.0297)	(0.0261)	(0.0334)	(0.0301)	(0.0295)
F × 50-54	-0.362***	-0.348***	-0.0846**	-0.102***	-0.103***
	(0.0296)	(0.0263)	(0.0354)	(0.0324)	(0.0319)
F × 55-59	-0.368***	-0.332***	-0.128***	-0.114***	-0.121***
	(0.0387)	(0.0355)	(0.0446)	(0.0410)	(0.0402)
Children (age of yngest)					
# children			0.0853***	0.0611***	0.0573***
			(0.00969)	(0.00945)	(0.00924)
Ch 0<3			0.109***	0.105***	0.0944***
			(0.0244)	(0.0233)	(0.0227)
Ch 3<6			0.138***	0.139***	0.137***
			(0.0275)	(0.0263)	(0.0258)
Ch 6<12			0.131***	0.127***	0.128***
			(0.0273)	(0.0264)	(0.0256)
Ch 12<18			0.130***	0.128***	0.132***
			(0.0294)	(0.0288)	(0.0280)
Ch 18+			0.0381	0.0292	0.0467
			(0.0310)	(0.0302)	(0.0299)

F × # children			-0.235***	-0.176***	-0.145***
			(0.0158)	(0.0144)	(0.0140)
F × Ch 0<3			-0.0583	0.0934***	0.0689**
			(0.0385)	(0.0348)	(0.0340)
F × Ch 3<6			-0.105**	-0.0172	-0.0132
			(0.0447)	(0.0402)	(0.0394)
F × Ch 6<12			-0.117***	-0.0644*	-0.0708*
			(0.0423)	(0.0381)	(0.0369)
F × Ch 12<18			-0.0603	-0.0624	-0.0838**
			(0.0440)	(0.0408)	(0.0398)
F × Ch 18+			0.0990**	0.0549	0.00676
			(0.0448)	(0.0414)	(0.0410)
Time					
Log hours		0.814***		0.783***	0.582***
		(0.0219)		(0.0218)	(0.0227)
Log weeks		0.551***		0.542***	0.510***
		(0.0290)		(0.0286)	(0.0272)
Education, Experience					
Adv degree					0.266***
					(0.00874)
Frac out last 5 yrs					-0.734***
					(0.0349)
Unemp rate in year *t*	-0.0123***	-0.00924***	-0.0123***	-0.00923***	-0.00991***
	(0.00340)	(0.00312)	(0.00334)	(0.00307)	(0.00299)
Constant	10.89***	5.666***	10.84***	5.775***	6.668***
	(0.0255)	(0.136)	(0.0254)	(0.135)	(0.136)
Observations	36,458	36,458	36,458	36,458	36,458
R-squared	0.202	0.333	0.230	0.348	0.384

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Source: NSLY79 (U.S. Department of Labor, Bureau of Labor Statistics, 2019.) For sample description, see text.
Notes: Sample truncates hours at 84 per week and imposes minimum annual earnings of half the 2009 federal minimum wage × 1,400 hours per year. All earnings data are in 2019 dollars.
M, F: Male, female.
Age: Omitted age group 25-29 years. The NLSY79 became biennial after 1994. In consequence, there are fewer respondents in their mid- to late-fifties for the 2014 and 2016 waves.
Children (Ch): Children are those born to the woman (or fathered by the man) by the age given. Adopted children's year of birth was not always available. Age of child is the age of the youngest. The number of children is top-coded at three.
Adv degree: All advanced degrees above the bachelor's.
Frac out last 5 yrs: Share of the past five years not working > 20 hours per week on average for the year is our measure of experience
Unemp rate in year t: Unemployment rate is used instead of year dummies.
NLSY79 2018 weights are used for all years.

Table 2b: Male and Female Pooled OLS Estimations of Log (Annual Earnings): Non-College Graduates

	Log (Annual Earnings)				
	(1)	(2)	(3)	(4)	(5)
Female (F)	-0.310***	-0.234***	-0.222***	-0.183***	-0.201***
	(0.0121)	(0.0108)	(0.0125)	(0.0111)	(0.0111)
Age Groups					
25-29	0.259***	0.228***	0.215***	0.192***	0.198***
	(0.0122)	(0.0109)	(0.0124)	(0.0111)	(0.0110)
30-34	0.393***	0.342***	0.318***	0.279***	0.275***
	(0.0124)	(0.0112)	(0.0131)	(0.0119)	(0.0118)
35-39	0.518***	0.450***	0.432***	0.379***	0.373***
	(0.0131)	(0.0121)	(0.0141)	(0.0130)	(0.0129)
40-44	0.606***	0.542***	0.520***	0.473***	0.469***
	(0.0131)	(0.0121)	(0.0145)	(0.0133)	(0.0132)
45-49	0.639***	0.583***	0.559***	0.524***	0.519***
	(0.0129)	(0.0118)	(0.0149)	(0.0138)	(0.0136)
50-54	0.656***	0.597***	0.581***	0.547***	0.544***
	(0.0130)	(0.0120)	(0.0158)	(0.0146)	(0.0145)
55-59	0.641***	0.600***	0.569***	0.555***	0.550***
	(0.0172)	(0.0159)	(0.0198)	(0.0184)	(0.0181)
F × Age Groups					
F × 25-29	-0.113***	-0.0714***	0.000422	0.00928	0.00949
	(0.0169)	(0.0149)	(0.0170)	(0.0152)	(0.0150)
F × 30-34	-0.172***	-0.112***	0.0233	0.0420***	0.0468***
	(0.0172)	(0.0153)	(0.0179)	(0.0161)	(0.0159)
F × 35-39	-0.253***	-0.178***	-0.0342*	0.0119	0.0244
	(0.0171)	(0.0156)	(0.0188)	(0.0172)	(0.0170)
F × 40-44	-0.240***	-0.183***	-0.0372*	0.00879	0.0198
	(0.0172)	(0.0156)	(0.0197)	(0.0180)	(0.0179)
F × 45-49	-0.226***	-0.185***	-0.0524**	-0.0109	0.000284
	(0.0177)	(0.0160)	(0.0211)	(0.0193)	(0.0190)
F × 50-54	-0.190***	-0.157***	-0.0386*	-0.00169	0.00914
	(0.0179)	(0.0163)	(0.0223)	(0.0204)	(0.0201)
F × 55-59	-0.212***	-0.174***	-0.0698***	-0.0274	-0.0206
	(0.0226)	(0.0207)	(0.0270)	(0.0248)	(0.0245)
Children (age of yngest)					
# children			0.0346***	0.0266***	0.0275***
			(0.00521)	(0.00491)	(0.00487)
Ch 0<3			0.110***	0.0967***	0.0910***
			(0.0142)	(0.0132)	(0.0131)
Ch 3<6			0.0986***	0.0928***	0.0871***
			(0.0157)	(0.0145)	(0.0144)
Ch 6<12			0.0840***	0.0787***	0.0730***
			(0.0145)	(0.0136)	(0.0135)
Ch 12<18			0.0756***	0.0641***	0.0610***

			(0.0150)	(0.0140)	(0.0139)
Ch 18+			0.0579***	0.0334**	0.0310**
			(0.0151)	(0.0143)	(0.0141)
F × # children			-0.105***	-0.0873***	-0.0753***
			(0.00732)	(0.00682)	(0.00673)
F × Ch 0<3			-0.223***	-0.0839***	-0.0826***
			(0.0210)	(0.0192)	(0.0190)
F × Ch 3<6			-0.206***	-0.136***	-0.0973***
			(0.0225)	(0.0205)	(0.0202)
F × Ch 6<12			-0.190***	-0.148***	-0.126***
			(0.0208)	(0.0193)	(0.0190)
F × Ch 12<18			-0.126***	-0.120***	-0.121***
			(0.0216)	(0.0199)	(0.0195)
F × Ch 18+			-0.0490**	-0.0457**	-0.0615***
			(0.0215)	(0.0199)	(0.0196)
Time					
Log hours		0.682***		0.667***	0.511***
		(0.0123)		(0.0121)	(0.0125)
Log weeks		0.524***		0.520***	0.494***
		(0.0140)		(0.0139)	(0.0136)
Experience					
Frac out last 5 yrs					-0.680***
					(0.0168)
Unemp rate in year *t*	-0.0130***	-0.00916***	-0.0132***	-0.00940***	-0.0114***
	(0.00183)	(0.00169)	(0.00182)	(0.00168)	(0.00165)
Constant	10.43***	5.828***	10.40***	5.873***	6.602***
	(0.0166)	(0.0730)	(0.0167)	(0.0727)	(0.0738)
Observations	107,912	107,912	107,912	107,912	107,912
R-squared	0.193	0.319	0.208	0.328	0.347

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Source: NSLY79 (U.S. Department of Labor, Bureau of Labor Statistics, 2019.) For sample description, see text.
Notes: Sample truncates hours at 84 per week and imposes minimum annual earnings of half the 2009 federal minimum wage × 1,400 hours per year. All earnings data are in 2019 dollars.
M, F: Male, female.
Age: Omitted age group 20-24 years. The NLSY79 became biennial after 1994. In consequence, there are fewer respondents in their mid- to late-fifties for the 2014 and 2016 waves.
Children (Ch): Children are those born to the woman (or fathered by the man) by the age given. Adopted children's year of birth was not always available. Age of child is the age of the youngest. The number of children is top-coded at three.
Frac out last 5 yrs: Share of the past five years not working > 20 hours per week on average for the year is our measure of experience
Unemp rate in year t: Unemployment rate is used instead of year dummies.
NLSY79 2018 weights are used for all years.

Table 3a: Male and Female Pooled Fixed Effects Estimations of Log (Annual Earnings): College Graduates

	Log(Annual Earnings)				
	(1)	(2)	(3)	(4)	(5)
Recovered Female Dummy [a]	-0.2666	-0.1995	-0.1832	-0.1506	-0.1736
Age Groups					
30-34	0.338***	0.293***	0.279***	0.239***	0.218***
	(0.0197)	(0.0169)	(0.0214)	(0.0186)	(0.0188)
35-39	0.605***	0.543***	0.493***	0.440***	0.408***
	(0.0252)	(0.0229)	(0.0296)	(0.0267)	(0.0273)
40-44	0.754***	0.705***	0.613***	0.572***	0.533***
	(0.0285)	(0.0264)	(0.0368)	(0.0342)	(0.0348)
45-49	0.809***	0.754***	0.653***	0.607***	0.567***
	(0.0302)	(0.0277)	(0.0431)	(0.0398)	(0.0402)
50-54	0.850***	0.803***	0.690***	0.649***	0.608***
	(0.0332)	(0.0306)	(0.0488)	(0.0456)	(0.0462)
55-59	0.834***	0.811***	0.676***	0.659***	0.618***
	(0.0407)	(0.0373)	(0.0554)	(0.0512)	(0.0514)
F × Age Groups					
F × 30-34	-0.180***	-0.137***	-0.0326	-0.0335	-0.0279
	(0.0302)	(0.0252)	(0.0317)	(0.0271)	(0.0266)
F × 35-39	-0.317***	-0.247***	-0.0581	-0.0485	-0.0521
	(0.0365)	(0.0316)	(0.0443)	(0.0390)	(0.0386)
F × 40-44	-0.370***	-0.309***	-0.0824	-0.0671	-0.0673
	(0.0418)	(0.0369)	(0.0536)	(0.0481)	(0.0479)
F × 45-49	-0.362***	-0.320***	-0.0996	-0.0815	-0.0800
	(0.0447)	(0.0392)	(0.0631)	(0.0564)	(0.0553)
F × 50-54	-0.338***	-0.328***	-0.119*	-0.114*	-0.113*
	(0.0458)	(0.0408)	(0.0686)	(0.0627)	(0.0620)
F × 55-59	-0.326***	-0.309***	-0.133*	-0.115	-0.126*
	(0.0556)	(0.0492)	(0.0795)	(0.0712)	(0.0707)
Children (age of yngest)					
# children			0.0720***	0.0688***	0.0677***
			(0.0240)	(0.0225)	(0.0215)
Ch 0<3			0.0519	0.0436	0.0351
			(0.0465)	(0.0433)	(0.0411)
Ch 3<6			0.0846*	0.0781*	0.0757*
			(0.0502)	(0.0468)	(0.0447)
Ch 6<12			0.0878	0.0781	0.0756
			(0.0534)	(0.0496)	(0.0472)
Ch 12<18			0.103*	0.0989*	0.0951*
			(0.0593)	(0.0552)	(0.0530)
Ch 18+			0.0971	0.0933	0.0905
			(0.0691)	(0.0651)	(0.0630)
F × # children			-0.195***	-0.170***	-0.142***

			(0.0422)	(0.0382)	(0.0363)
F × Ch 0<3			-0.131*	0.00491	0.00572
			(0.0761)	(0.0666)	(0.0633)
F × Ch 3<6			-0.178**	-0.0773	-0.0425
			(0.0827)	(0.0730)	(0.0680)
F × Ch 6<12			-0.162*	-0.0932	-0.0726
			(0.0880)	(0.0777)	(0.0731)
F × Ch 12<18			-0.0696	-0.0548	-0.0587
			(0.0954)	(0.0848)	(0.0803)
F × Ch 18+			0.0429	0.0316	0.00554
			(0.106)	(0.0951)	(0.0909)
Time					
Log hours		0.542***		0.525***	0.359***
		(0.0281)		(0.0278)	(0.0258)
Log weeks		0.432***		0.431***	0.408***
		(0.0273)		(0.0271)	(0.0255)
Education, Experience					
Adv degree					0.200***
					(0.0289)
Frac out last 5 yrs					-0.719***
					(0.0548)
Unemp rate in yr *t*	-0.0106***	-0.00834***	-0.0104***	-0.00810***	-0.00856***
	(0.00275)	(0.00246)	(0.00272)	(0.00245)	(0.00241)
Constant	10.77***	7.068***	10.78***	7.126***	7.835***
	(0.0231)	(0.147)	(0.0241)	(0.146)	(0.138)
Observations	36,458	36,458	36,458	36,458	36,458
R-squared	0.246	0.360	0.263	0.370	0.402
# individuals	1,260	1,260	1,260	1,260	1,260

[a] The female main effects in the fixed effects estimation were recovered.

Sources and Notes: See Table 2.

Table 3b: Male and Female Pooled Fixed Effects Estimations of Log (Annual Earnings): Non-College Graduates

	Log(Annual Earnings)				
	(1)	(2)	(3)	(4)	(5)
Recovered Female Dummy [a]	-0.3470	-0.2936	-0.2403	-0.2159	-0.2355
Age Groups					
25-29					
30-34	0.277***	0.252***	0.240***	0.217***	0.220***
	(0.0136)	(0.0125)	(0.0148)	(0.0136)	(0.0135)
35-39	0.418***	0.379***	0.354***	0.317***	0.311***
	(0.0163)	(0.0150)	(0.0196)	(0.0180)	(0.0179)
40-44	0.532***	0.484***	0.457***	0.410***	0.402***
	(0.0178)	(0.0165)	(0.0232)	(0.0213)	(0.0212)
45-49	0.614***	0.568***	0.535***	0.492***	0.484***
	(0.0180)	(0.0167)	(0.0255)	(0.0233)	(0.0232)
50-54	0.642***	0.603***	0.563***	0.527***	0.518***
	(0.0188)	(0.0174)	(0.0291)	(0.0267)	(0.0266)
55-59	0.633***	0.595***	0.552***	0.518***	0.511***
	(0.0203)	(0.0190)	(0.0329)	(0.0304)	(0.0302)
F × Age Groups					
F × 25-29	-0.140***	-0.104***	-0.0243	-0.0114	-0.0136
	(0.0200)	(0.0177)	(0.0212)	(0.0190)	(0.0188)
F × 30-34	-0.194***	-0.142***	-0.0119	0.0129	0.0116
	(0.0244)	(0.0216)	(0.0293)	(0.0266)	(0.0259)
F × 35-39	-0.234***	-0.173***	-0.0528	-0.00804	-0.00427
	(0.0261)	(0.0234)	(0.0354)	(0.0323)	(0.0317)
F × 40-44	-0.198***	-0.153***	-0.0594	-0.0135	-0.00985
	(0.0267)	(0.0241)	(0.0398)	(0.0366)	(0.0361)
F × 45-49	-0.175***	-0.144***	-0.0831*	-0.0407	-0.0369
	(0.0278)	(0.0251)	(0.0445)	(0.0411)	(0.0406)
F × 50-54	-0.120***	-0.0970***	-0.0600	-0.0206	-0.0162
	(0.0288)	(0.0263)	(0.0491)	(0.0451)	(0.0444)
F × 55-59	-0.131***	-0.105***	-0.0846	-0.0413	-0.0402
	(0.0338)	(0.0311)	(0.0543)	(0.0500)	(0.0492)
Children (age of yngest)					
# children			0.0318**	0.0307**	0.0318**
			(0.0158)	(0.0147)	(0.0145)
Ch 0<3			0.0755***	0.0709***	0.0655***
			(0.0272)	(0.0252)	(0.0250)
Ch 3<6			0.0793***	0.0785***	0.0731***
			(0.0301)	(0.0276)	(0.0271)
Ch 6<12			0.0656**	0.0672**	0.0626**
			(0.0324)	(0.0295)	(0.0290)
Ch 12<18			0.0599*	0.0603*	0.0582*

			(0.0338)	(0.0308)	(0.0303)
Ch 18+			0.0681*	0.0630*	0.0618*
			(0.0400)	(0.0368)	(0.0361)
F × # children			-0.106***	-0.0961***	-0.0791***
			(0.0232)	(0.0211)	(0.0206)
F × Ch 0<3			-0.261***	-0.160***	-0.147***
			(0.0418)	(0.0377)	(0.0370)
F × Ch 3<6			-0.231***	-0.172***	-0.127***
			(0.0445)	(0.0401)	(0.0392)
F × Ch 6<12			-0.158***	-0.128***	-0.104**
			(0.0482)	(0.0432)	(0.0422)
F × Ch 12<18			-0.0595	-0.0638	-0.0628
			(0.0515)	(0.0464)	(0.0454)
F × Ch 18+			0.0358	0.0285	0.0158
			(0.0579)	(0.0526)	(0.0515)
Time					
Log hours		0.492***		0.476***	0.366***
		(0.0181)		(0.0179)	(0.0167)
Log weeks		0.344***		0.340***	0.328***
		(0.0114)		(0.0114)	(0.0111)
Experience					
Frac out last 5 yrs					-0.560***
					(0.0248)
Unemp rate in yr *t*	-0.0165***	-0.0138***	-0.0169***	-0.0141***	-0.0154***
	(0.00158)	(0.00149)	(0.00157)	(0.00148)	(0.00146)
Constant	10.30***	7.134***	10.32***	7.221***	7.711***
	(0.0155)	(0.0814)	(0.0164)	(0.0810)	(0.0771)
Observations	107,912	107,912	107,912	107,912	107,912
R-squared	0.173	0.281	0.189	0.290	0.313
# individuals	3,742	3,742	3,742	3,742	3,742

[a] The female main effects in the fixed effects estimation were recovered.

Sources and Notes: See Table 2.

Table 4: Parental Gender Gap in Earnings, Motherhood Penalty, Price of Being Female, and Fatherhood Premium

Part A: College Graduates

Age Group	(1) Parental Gender Gap in Earnings	(2) Motherhood Penalty	(3) Price of Being Female	(4) Fatherhood Premium
25-29	-0.368	-0.061	-0.174	0.134
30-34	-0.456	-0.089	-0.201	0.165
35-39	-0.539	-0.118	-0.226	0.196
40-44	-0.584	-0.128	-0.241	0.215
45-49	-0.595	-0.114	-0.254	0.228
50-54	-0.603	-0.084	-0.287	0.232
55-59	-0.603	-0.068	-0.300	0.235

Part B: Non-College Graduates

Age Group	(1) Parental Gender Gap in Earnings	(2) Motherhood Penalty	(3) Price of Being Female	(4) Fatherhood Premium
20-24	-0.477	-0.132	-0.235	0.109
25-29	-0.509	-0.141	-0.249	0.119
30-34	-0.492	-0.142	-0.224	0.126
35-39	-0.497	-0.129	-0.240	0.128
40-44	-0.474	-0.100	-0.245	0.128
45-49	-0.466	-0.066	-0.272	0.128
50-54	-0.421	-0.040	-0.252	0.129
55-59	-0.435	-0.029	-0.276	0.130

Sources: Table 3a, col. (5) and Table A1.

Notes: These estimates use the results from the individual fixed effects estimation with log(hours), log(weeks), previous five year's work experience, and advanced degrees (for the college graduate sample). All parents are assumed to have children given by the data for women in Table A1 with regard to number and age of the youngest. Cols. (1) = col. (2) + col. (3) – col. (4).

Table 5: Parental Gender Gap in Earnings, Motherhood Penalty, Price of Being Female, and Fatherhood Premium for College Graduates by the Time Intensity of the Early Occupation

Part A: Time-Intensive Occupations

	(1)	(2)	(3)	(4)
Age Group	Parental Gender Gap in Earnings	Motherhood Penalty	Price of Being Female	Fatherhood Premium
25-29	-0.333	0.027	-0.168	0.192
30-34	-0.355	-0.012	-0.134	0.209
35-39	-0.432	-0.073	-0.122	0.237
40-44	-0.498	-0.142	-0.089	0.267
45-49	-0.578	-0.165	-0.127	0.286
50-54	-0.622	-0.141	-0.185	0.296
55-59	-0.574	-0.114	-0.158	0.302

Part B: Not Time-Intensive Occupations

	(1)	(2)	(3)	(4)
Age Group	Parental Gender Gap in Earnings	Motherhood Penalty	Price of Being Female	Fatherhood Premium
25-29	-0.296	-0.096	-0.132	0.068
30-34	-0.400	-0.118	-0.181	0.101
35-39	-0.481	-0.130	-0.225	0.126
40-44	-0.514	-0.127	-0.250	0.137
45-49	-0.511	-0.114	-0.256	0.141
50-54	-0.523	-0.085	-0.297	0.141
55-59	-0.541	-0.066	-0.331	0.144

Source: NSLY79 (U.S. Department of Labor, Bureau of Labor Statistics, 2019.)
Notes: Of the original NLSY79 sample of 1,260 unique individuals, 1,207 (parents and non-parents) have non-missing time-intensive occupations at an early age (and before the first birth). Time-intensive occupations and not time-intensive occupations are determined by the average share of workers with 45+ hours per week in these occupations in the 1990 Census and the average of five normalized characteristics from O*NET (Goldin 2014). The procedure is described in Appendix 3. Of the 1,207 individuals in this analysis, 828 were in occupations that were not time intensive and 379 were in a time-intensive occupation before the first birth or at an equivalently early age. These estimates use the results from the individual fixed effects estimation with log(hours), log(weeks), previous five year's work experience, and advanced degrees (for the college graduate sample) as in Table 3a col. (5).

Appendix

Appendix Table 1: Age Distribution and Number of Children by Age of Mother

Part A: College Graduates

Mother's age	Number of children	Fraction with Children by Age, among All Mothers				
		0 to 2	3 to 5	6 to 11	12 to 17	18+ years
25-29	1.324	0.780	0.150	0.065	0.005	0.000
30-34	1.666	0.588	0.281	0.109	0.021	0.001
35-39	1.930	0.285	0.300	0.347	0.059	0.008
40-44	2.021	0.066	0.146	0.488	0.257	0.040
45-49	2.064	0.004	0.026	0.274	0.490	0.207
50-54	2.082	0.000	0.002	0.048	0.353	0.597
55-59	2.122	0.000	0.000	0.007	0.104	0.888

Note: The sample is the same as used for Tables 2a and 3a. Row numbers for the fraction of children by age and age of mother sum to 1.0. The distribution and numbers of children by the age of fathers is very similar.

Part B: Non-College Graduates

Mother's age	Number of children	Fraction with Children by Age, among All Mothers				
		0 to 2	3 to 5	6 to 11	12 to 17	18+ years
25-29	1.313	0.635	0.297	0.066	0.000	0.000
30-34	1.638	0.458	0.303	0.232	0.006	0.000
35-39	1.913	0.251	0.263	0.394	0.092	0.001
40-44	2.048	0.110	0.142	0.426	0.277	0.045
45-49	2.105	0.024	0.062	0.278	0.404	0.232
50-54	2.119	0.002	0.011	0.119	0.329	0.538
55-59	2.132	0.000	0.000	0.022	0.173	0.804

Note: The sample is the same as used for Tables 2b and 3b. Row numbers for the fraction of children by age and age of mother add up to 1.0. The distribution and numbers of children by the age of fathers is very similar.

Appendix 2: Construction of Regression Samples

A fuller version is part of an on-line appendix (Goldin, Kerr, Olivetti, 2021).

Work History Information from Week-by-Week Arrays
The NLSY79 provides a rich and informative work history record for each respondent through constructed week-by-week arrays. These arrays cover the entire duration of a respondent's participation in the survey, including years in which they were not interviewed, through a backfilling procedure undertaken by NLSY staff. There are two week-by-week arrays central to our analysis: the status array and the hours array. The status array reports the job number of the primary jobs worked each week, or other labor force status if applicable. In addition to the status array, the hours array provides actual hours worked each week across all jobs. As described below, this measure also assists with the interpolation of self-reported income.

Interpolation of Self-Reported Income
Of particular interest to our analysis are annual incomes reported by respondents. We consider separately income from wages/salary alone and total income including both wage/salary and any own business/farm income.[32] The measure is collected only when the respondent is interviewed (unlike variables from the week-by-week arrays that are backfilled for missed interview years) and refer to the calendar year prior to the interview. Data are missing from skipped interviews, and the problem is amplified after 1993 when the survey switches from being annual to being biennial. In order to recover income in non-survey years and years in which a respondent is not interviewed but works positive hours according to the week-by-week array, we turn to a simple interpolation of missing values that uses the job and hour information from the week-by-week array. Although this method is imperfect, it allows us to recover a significant share of the missing incomes, particularly in the non-interview years after 1993. The imputation algorithm can be found in Goldin, Kerr and Olivetti (2021), an on-line appendix.

Sample Inclusion
Once we have interpolated the income variables, we then impose certain work history and income restrictions on the analysis sample. We only consider the respondents as employed if they earn at least half of the equivalent that a full-time, full-year worker would make at the federal minimum wage applicable to that year. We begin following a respondent's work history when they have worked positive hours for at least 26 weeks per year and at least 20 hours on average across the weeks with positive hours for two consecutive years. We continue to follow such respondents if they meet the requirements just mentioned for at least 20% of the time between their first eligible year (as defined above) and 2018.

Age of Youngest Child
We rely primarily on the dates of birth of all biological children of the respondent to measure the age of the youngest child in each year. Given our ability to follow families over

[32] When a respondent has both wage/salary and business/farm income, their total income is the sum.

multiple decades in the NLSY79, it is important to note that the youngest child in a given year is not necessarily the same child as the "youngest" child in the previous or subsequent year. The variable measures the age of the biological child who is the youngest alive in the given year. As such, the "age of youngest child" does not necessarily increase linearly across the survey years.

College Graduation and Advanced Degrees
The NLSY79 provides multiple measures of educational attainment. The first is the highest grade completed. This measure is collected beginning in 1979 and we rely specifically on the revised version of this variable constructed by the NLSY79 staff.[33] The second measure is the highest degree completed since the date of the last interview. That question, however, does not appear on the NLSY79 questionnaire until 1988. We construct a highest degree completed variable that captures the highest degree earned by the respondent in each year, leveraging the information contained in both the highest degree and the highest grade completed variables.

Upon constructing this complete year-by-year accounting of the highest degree completed, we then determined the year in which each respondent graduated from college with an undergraduate degree and construct the advanced degree dummy variable.

Current Marital Status
Current marital status is determined according to the start and end dates provided for the respondent's first four marriages, if applicable. The respondent is considered "currently married" from the year the marriage begins until the end of that marriage.

[33] See the NLSY79 Education Topical Guide for more information.

Appendix 3: Construction of Time-Intensive Occupations

The results in Table 5 divide the original sample of college graduate men and women into those who had a time-intensive occupation at an early age and those who did not. For those in our sample who eventually become parents, we consider the occupation associated to their job from one to three years prior to the birth of their first child. For those who never have a biological children (as of 2018), we assign each respondent a predicted date of first birth based on a regression of year of first birth on gender, race, age at college graduation, and respondent's birth year. Once non-parents are imputed a year of a pseudo child's birth, we assign them a pre-birth occupation in the same way we did for actual parents.

We determine whether the occupation is time intensive based on several factors. One is the share of workers in that occupation working 45 or more hours (based on the 1990 Census). Another is the average of the five O*NET characteristics in Goldin (2014). Occupations are deemed time intensive if they were in the top tercile of the distribution of both the share working 45 or more hours and the (normed and averaged) O*NET scores. All others are considered not time intensive.

The original sample included 1,260 unique individuals of which just 53 did not have a first occupation that could be used in the analysis (26 women, 27 men). Of the remaining 1,207 respondents (parents and non-parents) with a non-missing occupation variable before the actual or pseudo first birth, 379 respondents (31%) had a time-intensive occupation and 828 did not.

Of the 379 with time-intensive occupations, 238 are men and 141 are women. The median age at first birth was 31 for women and 32 for men. About 8% of the men and 7% of the women never married. Of the 828 who did not have a time-intensive occupation, 360 are men and 468 are women. The median age at first birth was 29 for women and 30 for men. About 12% of men and about 10% women never married.