

Does the impact of motherhood on women's employment and wages differ
for women who plan their transition into motherhood?

Jonathan Bearak*
Anna Popinchalk
Kristen Lagasse Burke
Selena Anjur-Dietrich

Abstract:

Women's ability to control their fertility through contraception and abortion has been shown to contribute to improvements in education and employment. At the same time, women's employment and wages decline substantially once they transition to motherhood. About a third of births are unintended, and it is unknown whether the impact of motherhood on employment, hours or wages is smaller for women who planned their transition into motherhood compared to those who did not. To explore this, we examine fixed-effects models to estimate labor market outcomes using panel data from the National Longitudinal Survey of Youth 1979-2014. Since prior studies have found that the association between motherhood and labor market outcomes is largest among white women, we also examine differences by race. We find that the relationship between motherhood and employment is significantly more negative among white women who plan their transition into motherhood compared to those who have unplanned first births. Among those who remain employed, we find that those with planned births work fewer hours and have lower wages relative to those with unplanned births. We do not find significant evidence that the association between motherhood and labor market outcomes differs by fertility intentions among black women. These findings highlight the challenges women face as parents in the workforce and make a novel contribution to the large body of research that associates unplanned births with negative outcomes.

Keywords: motherhood, gender, labor markets, pregnancy intentions, planned and unplanned births

* jbearak@guttmacher.org; Guttmacher Institute, 125 Maiden Ln, 7th Fl, New York, NY 10038

For many women, having children poses challenges which appear to adversely affect their economic trajectories. This highlights the importance of research into the structural and individual factors which contribute to the impact of motherhood on women's employment and wages. At the population level, research has shown that improvements in access to contraception have contributed to improvements in women's education and employment (Bailey, Hershbein, and Miller 2012; Bailey 2013; Goldin and Katz 2000, 2002). Contraception may help women to avoid becoming pregnant before they are ready, allowing them to invest in their education or career or to stop childbearing once they have had all of the children that they want. It also enables women not to have any children if they so desire. For the overwhelming majority of women who expect to and do have children, this logic suggests that women's ability to plan when to have their first births help explain associations between contraception and improvements in education and employment. However, about one third of all US births are unintended (Mosher, Jones & Abma 2012), and it is unclear whether unplanned births have a more disruptive impact on employment outcomes than those that are planned.

Research has consistently shown that women are less likely to be employed and earn lower wages after they become mothers compared to what would be expected had they not yet given birth (Korenman & Neumark 1992; Waldfogel 1997; Budig & England 2001; Budig & Hodges 2010; Wilde et al. 2010; DeNavas-Walt & Proctor 2015; England et al. 2016; Taniguchi 1999; Amuedo-Durantes & Kimmel; Florian 2018; England, Gornick & Shaffer 2012). This literature also discusses evidence of heterogeneity in the impact of motherhood depending on women's characteristics. However, we are unaware of any prior research which has analyzed the extent to which planning status of first birth plays a role in employment and wage differentials. To address this gap in the literature, we examine two competing hypotheses about the impact that the transition to motherhood has on women's employment and wages according to whether that first birth was planned or unplanned.

Women do a disproportionate amount of the work of raising children, and society historically has not provided substantial social supports to ameliorate the work-family conflict (England 2005). Some women may time their first births to minimize the likely disruption to their careers or employment. If, by planning for this event, these women are in a better position to address the challenges they may face at work, then a woman who plans her first birth may experience fewer adverse impacts on her employment and wages, which we refer to as Hypothesis 1 (H1).

Structural factors such as discrimination contribute to the relationship between motherhood and employment and earnings, and women may experience real and perceived tensions between their roles as employees and as mothers (cites). Although women may plan childbearing in response to these structural factors and tensions, it may do little to mitigate this conflict (cites).

Consequently, women who plan their pregnancies may do so at a time when they are more willing or more able to reduce their commitment to employment to care for children, motivated by the understanding that the labor market may not readily accommodate

motherhood. Thus, we argue that it is plausible that women who plan when to become mothers are in a better position to reduce the time spent at work, or disinvest from the labor market, and that planned first births will be more negatively associated with labor market outcomes than those that are unplanned. We refer to this as Hypothesis 2 (H2).

Unintended births are more common among socially and economically disadvantaged populations (Musick et al; Mosher et al), so if Hypothesis 1 is correct, then, unintended births could compound this economic inequality. Evidence in support of Hypothesis 2 would instead emphasize the importance of improving social policies that address challenges of raising children, which, as with other forms of care work, fall disproportionately on women. Additionally, such findings could lend further support to efforts to destigmatize unplanned births.

Previous studies have explored whether and how the impact of motherhood on employment and wages varies by women's background or job characteristics (e.g., Budig & England 2010; England et al 2016; Budig & Hodges 2010; Wilde, Batchelder & Elwood 2010; Florian 2018). These studies have generally found that the motherhood wage penalty is smaller among black women than among white women, as is the relationship between motherhood and employment (Hill 1979; Waldfogel 1997; England et al 2016; Florian 2018). Some researchers have further argued that the motherhood wage penalty varies according to skill and one's location in the wage structure (Wilde et al 2010; Budig & Hodges 2010; England et al 2016). Socioeconomic advantage has been found to be positively associated with planned fertility (Musick et al; Mosher, Jones & Abma 2012), and to disentangle roles of race and, secondarily, skill, we will also examine whether the impact of motherhood is larger for women who have planned or unplanned first births separately by race and skill.

In sum, existing research suggests that women's ability to control when they become mothers predicts higher educational attainment, employment and earnings at the structural level. However, there is little to no research on whether planned childbearing among individual women moderates the association between motherhood and women's labor market outcomes. To assess this, we analyze panel data from the National Longitudinal Survey of Youth (NLSY79) in which we observe women's employment and wages both before and after they became mothers, and compare the association between motherhood and three labor market outcomes—employed, hours and wages—for women who planned their first births to women who did not.

Our research addresses multidisciplinary questions that have emerged from the sociology, economics, demography and reproductive health literatures. Our work contributes to the literature on motherhood and employment by showing a previously unexplored way in which the economic consequences of motherhood differ between groups of women. Our findings can contribute to sociologists' understanding of why mothers are less likely to be employed and have lower wages than non-mothers. Our work also contributes to the fertility intentions

literature by not starting with the presumption that unplanned births are only associated with “negative” outcomes.

Contraception and abortion

Planned childbearing can be achieved through several mechanisms: manipulating sexual activity (e.g., only having sex when trying to conceive), using contraception and abortion. Of these three, contraception has been the most widely studied in regards to its potential impact on employment and earnings. Prior studies have exploited spatiotemporal variation in access to contraception using difference-in-difference techniques to estimate plausibly causal effects on education, employment and earnings. Goldin & Katz (2000, 2002) analyzed variation across states in the availability of oral contraceptives due to changes in state laws in the 1960s and the 1970s and found that access to contraception was a major factor in the growing numbers of women obtaining a college education and pursuing advanced professional degrees. In addition, Bailey et al. (2012) provide persuasive evidence that changes in contraceptive access during this period significantly contributed to young women’s joining the paid labor force and pursuing professional occupations. These changes, in turn, contributed to women’s increased earning power and to a reduction in the long-standing gender gap in pay (Bailey, Hershbein, and Miller 2012; Bailey 2013; Goldin and Katz 2000, 2002).

Notably, these studies were unable to address the mechanisms through which individual women’s contraceptive use directly contributed to their increased education and employment. Undoubtedly, reliance on highly effective birth control allowed women to delay fertility and family formation, or to avoid childbearing altogether, making it easier to complete college and enter the labor market. Contraception also allowed women to have fewer children, which may also have facilitated labor market participation, albeit at a reduced wage. The embedded assumption of these dynamics is that women were better able plan their births, and to do so in a way that best met their educational and employment aspirations.

Around the time that the birth control pill became widely available to unmarried women, abortion was legalized and this, too, allowed women to better control their fertility. Associations between abortion, education and employment have not been widely studied. Several macro analyses suggest that the legalization of abortion was associated with increased employment (Angrist & Evans 1970; Klein 1997). Even less research has examined the potential impact of abortion access at the individual level. Specifically, we are aware of one recent study that directly assessed how abortion contributed to individual women’s economic outcomes. The Turnaway Study collected longitudinal data over a five-year period from women who had abortions and those who sought but were denied abortions because they were past the facility’s gestational limit. Foster and colleagues (2018) found that, compared to women who obtained abortions, those who carried unintended pregnancies to term had a lower probability of employment and a higher probability of having family incomes below the federal poverty threshold. However, these findings may have limited application to the labor market literature as women who obtain, or seek to obtain, abortions are younger and poorer than the larger

population of women, and because causal findings from within a regression discontinuity framework may not generalize beyond women who seek abortions close to the gestational age limit.

Unintended pregnancy

Unintended pregnancy is considered a public health issue, and reducing the incidence of unintended pregnancy is one of the goals of Health People 2020. A substantial body of literature addresses unintended pregnancy, including the frequency with which it occurs, the characteristics and the health outcomes of the individuals who have them and the potential impacts intention status has on infant and child health.

For purposes of our study, one consistent finding that has emerged from this body of work is the association of unintended pregnancy with social and economic inequality. Rates of unintended pregnancy are substantially higher among adolescents and young adults, less educated and lower income women, unmarried individuals and women of color (Finer & Zolna 2016). These patterns suggest that social and economic disadvantage make it harder for women and couples to plan pregnancies, or to avoid becoming pregnant when they do not want to be.

Notably, much of the research on unintended pregnancy describes demographic risk factors. Some research has examined teen fertility (e.g., Diaz & Field 2016), but, unintended pregnancies are common among all age groups, and, while a larger share of teen births are unintended, most unintended pregnancies occur to women in their 20s and 30s. Studies examining the potential consequences of unintended pregnancy for women have focused on mental and physical health outcomes and, apart from the above mentioned research, it is currently unknown if and how unintended births impact women's employment and economic outcomes.

If unintended pregnancy is a result of disadvantage and marginalization, it might further perpetuate inequality. For example, it could interfere with education, job opportunities or advancement. However, individuals with fewer socioeconomic opportunities may select into unintended fertility precisely because of such inequality of opportunity. That is, fertility intentions may reflect inequality, and its associations with subsequent disadvantage may be at least in part spurious.

These is an additional caveat to interpreting this literature that is worth noting. The conventional measure of intention status asks respondents whether a given pregnancy came at the right time, too early or if they had not wanted to have any (more) children. Pregnancies that were too early are typically considered mistimed and the latter as unwanted; both of these groups make up the category of unintended pregnancies. This measure of "intention" status does not actually measure intentionality, as a woman may consider an unplanned pregnancy to have "come at the right time."

The impact of motherhood

Motherhood is negatively associated with whether a woman is employed as well as how many hours she spends at work (Florian 2018; Budig 2003; England, Garcia-Beaulieu, and Ross 2004; Killewald and García-Manglano 2016; Hynes and Clarkberg 2005). A substantial body of work has also established that the wages of women who have children grow more slowly than their wages would have had they not yet had children. Researchers have found that this difference

persists even after taking into account changes in the number of hours worked per week, accumulated work experience or tenure at the same job (Hill 1979; Korenman & Neumark 1992; Waldfogel 1997; Budig & England 2001; Hodges & Budig 2010; Wilde et al. 2010; DeNavas-Walt & Proctor 2015; England et al. 2016). Numerous analyses have employed person-fixed-effect models to address selection using panel data, and some researchers have employed instrumental variable techniques. In addition, this pattern has been found in cross-sectional analyses of several developed countries (Budig, Misra & Boeckman, 2012; England, Gornick & Shaffer 2012).

This body of work suggests that motherhood in and of itself leads to lower employment and earnings. Researchers have discussed a number of structural factors which could contribute to these relationships. These mechanisms include gender discrimination by employers; expectations of continuous work experience which affect future employability and wages; fixed working hours with limited flexibility; low levels of societal support for balancing work and childcare; and a gendered image of an “ideal worker” who is devoted and available for their job above all else (Acker 1990; Gerson 1986; Correll, Benard, and Paik 2007; Stone 2008).

We hypothesize that family planning would not be able to substantially address or counteract these issues. For example, it is not apparent that employers would discriminate less if a woman planned her birth, and social support for balancing work and family would remain low. Sociocultural norms would continue to validate, and even valorize, domesticity for women but not for men. Consistent with this view, we note that even as gender earnings inequality has declined over time due to faster increases in women’s earnings compared to men’s, an analysis of the Current Population Surveys suggests that the impact of motherhood on women’s employment and wages accounts for a larger proportion of the gender pay gap than it did in earlier time periods (Juhn and McCue 2017).

Tension between motherhood & employment

Whereas we suspect that planning cannot completely or substantially counter these larger structural factors, we also posit that planning may be a response to the tension between motherhood and employment caused or exacerbated by these larger constraints. We identify two potential rationales for why women who plan childbearing may be more likely to disinvest in the labor market upon becoming mothers.

(a) One possibility is that women plan their births to occur at a time when they are most willing or most able to exit or spend less time in the labor market. We suspect that when a woman decides that it is the “right time,” and actively tries to become pregnant, she may also be signaling that she is at a point in her life where she is willing to focus on domestic responsibilities even if that means a reduction in time spent in the labor market.

(b) Another possibility is that women who plan childbearing are more responsive to the tension between motherhood and employment. Consistent with this view, data from the National Survey of Fertility Barriers suggests that planned childbearing is most salient to women who are

career-conscious (Simoni, Mu, and Collins 2017). However, women who originally anticipated continued employment after their first birth may find that it is more challenging than anticipated to maintain their expected level of labor market commitment (Stone 2008). Those who have the ability to disinvest or spend less time working may opt to do so (Gerson 1986; Stone 2008).

Limited qualitative evidence supports that this phenomenon occurs. In her qualitative study of career-driven women who dropped out of the labor force, Stone (2008) found that women report being “mommy tracked” within their jobs because as they were regarded as unable to meet the standards of the “ideal worker.” They framed their decision as a “choice” but, Stone argues, they were constrained by social structures. These factors, in conjunction with the pull towards cultural concepts of an ideal mother, could lead some women to “opt out,” even in cases of longstanding investment in their careers.

However, we suspect that due to pervasive sociocultural norms, “opting out” is not merely an elite phenomenon. Gerson (1986), in her qualitative study of white women in geographically and socially diverse neighborhoods in the Bay area, discusses such influences as “sufficient behavioral similarity among women to provide mutually reinforcing support for female domesticity.” Women may not have to be middle class or wealthy to experience what is, for them, the “right time” to focus more on the domestic sphere than on the labor market. Consistent with this view, research has also shown that husbands’ earnings have a limited association with wives’ employment, and that motherhood substantially relates to women’s labor force participation across socioeconomic strata (Killewald & Gough 2013; Killewald & Zhou 2012). In addition, Marxist feminist scholarship has discussed how family roles constrain women’s labor force participation across class groups (e.g., Hartman 1981; Tilly & Scott 1978). Thus, we suspect that both of the possibilities we just outlined could lead to a larger negative association between motherhood and women’s labor market outcomes among women whose first births were planned.

Sociocultural norms and expectations

In their analysis of an earlier cohort of women from the original National Longitudinal Survey, Waite & Stolzenberg (1979; Stolzenberg & Waite 1978) found that, although women expressed a desire to work, or to both work and raise a family, at baseline, many women nonetheless dropped out of the labor force after giving birth. They argued that as women gained experience, they became more attuned to work-family tension, a process they dubbed the “learning hypothesis.” More recent work explores how sociocultural norms and expectations can influence women’s decisions to disinvest or withdraw from the labor market even when it is not in their economic interest to do so (or may be even be counter to it) (Gerson 1986).

The tension between family and work has been referred to as a set of “competing devotions” which may stem from cultural narratives and expectations around motherhood and domesticity (Blair-Loy 2003). Women continue to negotiate this tension even as societies become more

egalitarian, with men taking on more roles within the home and women's employment increasingly normative (Blair-Loy 2001; Stone 2008). Some scholars have argued that historically, the dominant cultural narrative around motherhood in the United States, or motherhood ideology, has revolved around the experience of middle-class white women (Arendell 2000; Romagnoli and Wall, 2012; Gerson 1986). Under the "intensive mothering" paradigm (Arendell 2000; Romagnoli and Wall, 2012) a good mother is self-sacrificing and engages in an all-consuming form of childcare and this conflicts with employment (Arendell 2000). The ability to fulfill these obligations may be more easily achieved among the white, upper-middle class, but this research suggests these attitudes are widespread.

Other studies suggest that Black women may experience a different set of cultural narratives and pressures than white women when it comes to navigating work and motherhood. Black women have historically worked outside the home at higher rates than white women, though current levels of employment are comparable between the two groups. The intensive mothering paradigm is rooted in historical cultural norms of a permanent, stable marriage where a household income could be obtained from the husband's paycheck (Arendell 2000; Romagnoli and Wall, 2012; Gerson 1986). However, this household structure has historically been less feasible among black families where structural racism has often required that all adult family members contribute to the family income. Similarly, several studies have found that, although many black and white women experience a "double bind" of being pulled toward both work and domesticity, black women also value economic self-sufficiency (Dean, Marsh, and Landry, 2013; Florian 2018; Barnes 2008; Roberts 1993; Collins 1990). Race differences in gender earnings inequality and economic necessity mean that black women have more of an economic burden compared to white women (Dow 2016). In one study, Black wives' employment was found to increase average household income by 88%, compared to an increase of only 39% for white wives (Yoon & Waite 1994). In addition, some qualitative studies have found that black mothers experience more social support and approval for continuing employment upon becoming mothers than do white women (Barnes 2008; Landry 2002). In sum, economic necessity as well as differences in the importance of economic self-sufficiency could contribute to a smaller relationship between motherhood and employment.

Evidence suggests that the relationship between motherhood and women's employment is particularly large among white women (Florian et al 2018). Additionally, recent findings point to a more negative association between motherhood and wages among high-skill white women toward the top of the wage structure (England et al 2016). These differences were explained by a much more substantial return to cumulative years of work experience and tenure among such

women (England et al 2016; Wilde et al 2010).¹ The salient point is that both race and measures of cognitive skill predict differences in job characteristics and other factors including exposure to different sociocultural norms and assortative mating, all of which may lead to heterogeneity not only in the relationship between motherhood and women’s labor market outcomes, as other studies have addressed, but also in how birth planning moderates this relationship. For these reasons, we test our hypotheses separately by race and, secondarily, by a proxy for skill.

Data & Methods

Data & Variables

In this analysis, we use nationally representative panel data from the National Longitudinal Survey of Youth 1979 (NLSY79) to examine the employment and wage experiences of black and white women. This panel represents the cohort of women in the United States born between 1958 and 1965. The respondents were first interviewed in 1979 at age 14-21. We use data collected from women through the 2014 interview when the cohort was aged 49-58. Over this 35-year period, data were collected annually through 1994 and every two years thereafter; individual women were interviewed up to 26 times. This cohort is, roughly speaking, the second half of the baby boom, and, as of 2014, had largely completed childbearing. We limit our analyses to black and white women due to limited power for analyzing other populations.

We examine three dependent variables: whether a woman is employed at the time of interview; how many hours she reports that she usually works per week; and the natural log of her hourly rate of pay. This information comes from the NLSY work history file.² We take the natural log of wages in order to estimate proportionate changes in wages. We convert wages to constant 1996 dollars using the consumer price index, and we top- and bottom-code wages at \$0.50 and \$250, such that our coding procedure is consistent with other recent studies (Budig & Hodges 2014; England et al 2016). We top-code hours at the 99th percentile, 65 per week. To address unobserved heterogeneity, we employ person-fixed-effects models to address selection. This requires at least two observations for each respondent, and of the 5,171 women first interviewed in 1979, 4,685 women reported wages and hours at least twice. Like England et al (2016), we exclude person-years during which women are enrolled in school (secondary school or higher education) because employment and wages in those years may be misleading.³ After excluding observations with missing data on the covariates of analyses of hours/wages, our analytic sample includes 34,757 person-years of data from 3,036 non-Hispanic white women and 17,087 person-years from 1,329 non-Hispanic black women. Fixed-effect

¹ For an alternate perspective, see Budig & Hodges (2010), which used quantile regression to test whether the association between children and wages differs across the wage distribution. They found that motherhood lowered the bottom of the wage distribution more than the top. However, Killewald & Bearak (2014) argued that their statistical methods did not address this question and suggested an alternative approach used in the subsequent analysis by England and colleagues (2016).

² <https://www.nlsinfo.org/content/cohorts/nlsy79/topical-guide/employment/work-history-data>

³ For a discussion of this issue, see England et al (2016), endnote 10.

probability models utilize within-person variation on the dependent variable, and our analytic sample for the dichotomous measure of employment includes 33,249 person-years of data from 2,166 white women and 19,410 person-years of data from 1,054 black women.

Our independent variables of interest are years since the first birth and planning status. Years since the first birth is a categorical variable which indicates whether a woman had a birth and, if so, the number of years since the birth. Like Wilde et al. (2010), we distinguish between “not yet had a birth,” “first four years after the first birth,” “years 5-9 after the first birth,” and “10 or more years after the first birth.” This allows us to distinguish between short- and long-term impacts of motherhood.

We constructed a four-category measure of birth planning status based on a series of questions asked of each reported pregnancy (Figure 1). Respondents were first asked whether they had ever used contraception, prior to the pregnancy. Among women who had never used contraception, a follow up item asked if the reason they had not been using at the time of conception was because they had wanted to become pregnant. Women who responded “yes” were considered to have a *planned* first birth. Women who indicated that they had ever used contraception were asked if they had stopped using contraception in order to become pregnant. Respondents who indicated “yes” were also considered to have *planned* births. Among the “unplanned” first births, we considered three categories: *wanted*, *mistimed* and *unwanted*. On the follow up item for unplanned births, women who indicated they had not stopped using contraception but wanted to become pregnant were considered to have *unplanned but wanted* first births. First births to women who had not been using contraception and indicated that they wanted to have a baby, but not at the time, were considered *mistimed*. Finally, first births to women who indicated they had not wanted to have any children at the time they became pregnant were considered *unwanted*.

This variable is similar to, but slightly different from, the conventional measure of pregnancy intentions which focuses on timing as opposed to intention. The conventional measure of pregnancy intentions only takes timing of pregnancy into account (e.g., a pregnancy that was reported to come “at the right time” is categorized as intended) and does not incorporate contraceptive use or whether an individual wanted, or was trying, to become pregnant. We consider our measure of planning status to be better suited to the current analyses as it allows us to directly examine intentionality (which is something the conventional measure does not do despite its label).

The reference categories in our analyses are “never/not yet given birth” for the four-category years since first birth variable and “planned” for the four-category birth planning variable. Because our hypotheses relate to differences between women who experience planned and unplanned first births, outcomes among women who planned their pregnancies, we consider this to be the most appropriate comparison group. When “never/not yet given birth” equals “1” all other categories of both the years since first birth and planning status variable equal “0.” We

examined additional models that allow differences between women with planned and unplanned births to vary over the length of motherhood with similar results.

In our descriptive analysis, describing sample characteristics, we also utilize the gender attitudes question previously explored by Waite & Stolzenberg (1979; check if it was this or Stolzenberh & Waite 1978) in their analysis of an earlier cohort. Women were asked, “What would you like to be doing when you are 35 years old?,” in the years 1979-1986. Women could indicate either “Working” or “Married, raising a family.” Those who responded in the latter were then asked whether they would also like to be working. We retained the latest response given prior to the first birth, and examined whether women’s answers differed according to whether they went on to have a planned or an unplanned first birth.

Analytic strategy

We test our hypotheses separately by race so that differences by race are not confounded with differences by planning status. Our unit of analysis is a person-year, and standard errors are adjusted to account for the non- of observations within persons and sampling characteristics are accounted for in the regressions.

We generate a series of models to test whether the impact of motherhood differs by planning status. Model 1 includes several time-varying controls measured at each wave. We include indicators for the survey year to adjust for secular trends. We include a quadratic for age at interview, a categorical variable for educational attainment at interview (less than high school, high school, some college, and college), and their interaction. We also adjust for region, metropolitan statistical area classification and whether the respondent lives in an urban area at interview.

Some research has argued that the impact of motherhood may vary according to the number of children a respondent has had (e.g., Budig & England 2001; Budig & Hodges 2010; England et al 2016), and women with unintended fertility typically have more children (Musick et al 2007). If, in the subsequent years after the first birth, the association between work and motherhood is mediated by the total number of children this could affect our estimates of the difference in the impact of motherhood by planning status. To account for this, Model 2 controls for the number of additional children the respondent has had.

Marriage is associated with both motherhood and employment. Additionally, spousal earnings may allow some women to reduce their time spent in employment. Model 3 includes a dichotomous control for marital status, as well as quadratics for the spouse’s hours and annual earnings.

We additionally examine our hypotheses separately among skill groups. Like Wilde et al (2010) and England et al (2016), we measure cognitive skill using age-adjusted scores from a standardized test, the Armed Forces Qualifying Test (AFQT), administered during the second wave. This test is moderately positively correlated with earnings (England et al. 1999; Neal and

Johnson 1996; Farkas et al 1997). Although skill is not the only possible predictor of professional jobs with higher earning potential, we follow Wilde et al (2010) in the view that skill is a more plausibly exogenous predictor than other potential measures such as educational attainment. We group women into race-specific terciles, such that equal proportions of white women and black women are apportioned into each group, and we compare women in the top tercile to women in the lowest and middle terciles.

We present results from models estimated separately by race, or separately by race and skill. This is equivalent to fully interacting all variables with race, or with race and skill, respectively, such that our most saturated model may be described as follows:

$$\begin{aligned} \text{logit } employed_{ijt} &= \sum_{j=0}^1 \sum_{k=0}^1 (MOTHER_{it} \times LENGTH_{it} \beta_{1jk} + MOTHER_{it} \times INTENTION_{it} \beta_{2jk} \\ &+ ADDITIONAL CHILDREN_{it} \beta_{3jk} + age_{it} \beta_{4jk} + age_{it}^2 \beta_{5jk} \\ &+ EDUCATION_{it} \beta_{6jk} + age_{it} \times EDUCATION_{it} \beta_{7jk} \\ &+ age_{it}^2 \times EDUCATION_{it} \beta_{8jk} + MARRIAGE_{it} \beta_{9jk} \\ &+ spouse's earnings_{it} \beta_{10jk} + spouse's earnings_{it}^2 \beta_{11jk} \\ &+ spouse's hours_{it} \beta_{12jk} + spouse's hours_{it}^2 \beta_{13jk} + REGION_{it} \beta_{14jk} \\ &+ MSA_{it} \beta_{15jk} + urban_{it} \beta_{16jk} + YEAR_{it} \beta_{17jk}) + \alpha_i + u_{it} \end{aligned}$$

The subscript t indexes the waves so that it uniquely identifies person-years. The person-fixed-effects are indicated by α_i , capturing time-invariant unobserved heterogeneity between respondents, and u_{it} is an error term.

The subscript j indexes skill and k indexes race, and so the coefficients β_1 through β_{17} are indexed jk because the estimated associations vary by race and skill. This specification is equivalent to estimating models for each combination of the race and skill categories.

Descriptive Findings

There are notable differences in planning status of first births by race (Table 1). Among white women, two thirds of first births were planned (67%); 24% were mistimed (not wanted at the time they occurred) and 4% unwanted (the respondent reported that she never wanted to have children). Among black women, the order was somewhat reversed; 58% of first births were either mistimed (44%) or unwanted (14%), and 34% were planned. The proportion of wanted unplanned first births is relatively small for both groups— 4% among white women and 8% among black women. Examining these patterns separately by skill (Appendix Table 1) additionally shows that planned births are more common among both black and white women in the highest tercile.

We do not observe a bivariate relationship between employment and planned childbearing in 2014, at a time when the childbearing years had been largely completed (Table 2). Nearly two-

thirds of the sample worked full-time regardless of race or planning status. About a quarter of white women, and about a third of black women, were not employed, regardless of planning status.

In contrast to employment, we did find evidence that the average wages of women in 2014 differed by planning status of the first birth, though only for white women; those who planned childbearing earned nearly \$3 more per hour compared to those who did not.

We also examined women's responses to a gender attitudes question posed at baseline and through 1986, which asked, "What would you like to be doing when you are 35 years old?" Of women who responded to this question prior to giving birth, the answers of women who went on to have planned first births were very similar to those who went on to have mistimed first births. About two-thirds of white women who had planned (67%) and unplanned (66%) first births responded "Working" (Figure 2a). This response was more common among black women, for whom the corresponding figures were 80% and 87%, respectively. Among women who reported that their first birth was unplanned but wanted, however, significantly fewer – 50% of white women and 55% of black women – responded "working." Women who responded "married, raising a family" were asked a follow-up question, "Would you also like to be working in addition to this?" More than half, regardless of whether they went on to have a planned or unplanned first birth, answered in the affirmative (Figure 2b). These results suggest that, at baseline, the overwhelming majority of women expected to be employed at age 35. Women's attitudes about whether they wanted to participate in the labor market were similar across first birth planning status, except for the small proportion who went on to have unplanned but wanted first births.

We next examine the employment trajectories of black and white women prior to their first birth, according to planning status (Figure 3). These patterns show that, before they gave birth for the first time, a larger proportion of women who planned their first births were employed than among women who went on to have an unplanned first birth. After they give birth, however, these differences began to dissolve. These patterns were seen among both Black and white women.

The smallest proportion of women were employed in the year just after they become mothers, during which time women who planned their first birth remained substantially more likely to be employed than women who did not. Around the fifth year after the first birth, however, differences in employment levels by planning status were no longer evident among white women, and were seen only among black women.

These patterns also suggest that women's employment trajectories change only after they become pregnant with their first child. Employment may decline slightly among some of the groups graphed by the year immediately preceding motherhood, presumably due to the pregnancy itself.

We next test whether differences by planning status in the impact of motherhood on employment, hours and wages are evident after adjusting for differences in women's characteristics.

Regression Estimates

Employment

We estimated a sequence of three conditional logistic regressions separately by race. Model 1 includes controls for age, education, and their quadratic interaction; geographic controls; year dummies, and person-fixed-effects. In Model 2, we additionally controlled for total fertility. This is because, if Hypothesis 1 is correct, and the impact of motherhood is larger for women who have an unplanned first birth, this could also result in higher fertility. In Model 3, we also controlled for marital status, as well as the earnings and hours worked per week by the spouse. This model takes into account that spouse's employment and income may affect women's labor force participation. In most outcomes we found similar results across all three specifications.

Planning status of first births is associated with subsequent employment only for white women (Table 3). In particular, relative to women who had a planned first birth, those who indicated the birth was mistimed were significantly more likely to work after becoming mothers. Estimates across all specifications supported Hypothesis 2, with odds ratios between 1.64-1.82, and the coefficient for mistimed declining significantly ($p < .001$, χ^2 test) after controlling for husbands' characteristics. The small subset of white women who indicated the birth was unwanted were also more likely to be employed than those with a planned birth, though this association was only marginally significant and weakened to the point of insignificance when spouses' characteristics were taken into account.

Among black women, in contrast, we do not find significant evidence that the impact of motherhood on employment differs by birth planning. In addition to being non-significant, the odds ratios for mistimed are close to 1 in all models.

The significant differences by planning status which we observe among white mothers are relative to a substantial baseline effect of motherhood. The odds ratios for employment within the first decade since the first birth are 0.13-0.23, and, for later years, 0.33-0.52, depending on the model. These patterns suggest that the likelihood of being employed increases substantially with the passage of time for white women. Smaller but still meaningful associations were seen among black women for whom likelihood of employment also decreased after first birth.

In sum, the proportion of women who are employed declines substantially after they become mothers. However, this decline is significantly larger among white women who planned their first births, compared to those who did not.

Hours

As with employment, planning status of first births for white women is also associated with the subsequent number of hours a woman spends on market labor (Table 4). Relative to women

who had a planned first birth, those who indicated the birth was mistimed worked an average of 1.11-1.39 hours fewer after becoming mothers. In contrast to employment where spouse's employment and income further reduced the likelihood of employment, the inclusion of these controls resulted in an association that was lower and only marginally significant.

The coefficients were around twice as large for the small subset of white women who indicated the birth was unwanted. However, these coefficients were never more than marginally significant in any model.

These estimates, as with those previously discussed, are consistent with Hypothesis 2, which predicts that the association between motherhood and women's labor market outcomes is more negative for women whose first births are planned. Among black women we find no support for Hypothesis 2 insofar as the coefficients for mistimed and unwanted are non-significant no matter the specification. Additionally, for the small subset of black women whose first birth was unplanned but wanted, the results were negative and, in turn, compatible with Hypothesis 1.

Differences in hours by birth planning status, when significant, were small in absolute terms. However, they are substantial when measured relative to the baseline effect of motherhood. In Model 3, in which the estimated differences between mothers and non-mothers are smallest, this ranges from about 5 hours in the first four years of motherhood, to just under 3 hours after the first decade of motherhood. These patterns were less pronounced for black women. Baseline coefficients range from -0.89 to -1.43 , and in some instance associations were only marginally significant.

In sum, in models estimating hours among employed women, as with the models estimating employment, we found evidence consistent with Hypothesis 2 among white women. In contrast to the employment estimates, where husbands' earnings reduced this association, the controls in specification 3 rendered differences by birth planning non-significant when estimating hours.

Wages

Among both white and black women, the motherhood wage penalty is similar for women who had planned and mistimed first births (Table 5). Among white women, there was little difference in their hourly rate of pay by birth planning status, with one exception. Mothers whose first births were unwanted earn 25-26% higher wages (e^{-21} - e^{-22}) than mothers whose first births were planned. Moreover, these differences are substantial relative to the baseline wage penalty, which ranges from -6% in the first four years since the first birth, to -15% to -19% after the first decade, depending on the specification. However, differences in the wages of those with planned and mistimed first births are non-significant and approach zero.

As with hours, we find evidence that black mothers with unplanned but wanted first births earn lower wages than those whose first births were planned. In contrast, the baseline effects of motherhood on the wages of black women are not significant in any model.

Employment and hours by skill

For brevity, we report estimates from our most saturated model when reviewing results by skill (Table 6). Differences by planning status in the impact of motherhood on white women's employment are evident regardless of skill level. In particular, relative to white women who had a planned first birth, those who indicated the birth was mistimed were more likely to work in both the low-mid and top tercile.

We also find evidence that white women with unplanned first births worked slightly more hours than those whose first births were planned, but only among those who did not score in the highest skill tercile.

An exception to the general pattern of results for white women is the odds ratio for *unplanned but wanted* in the top skill tercile, which shows this small proportion of women were less likely to be employed compared to those who planned their first birth.

For black women, in models which averaged across skill groups, we did not find evidence that the impact of motherhood on the probability of employment differs by planning status. The odds ratios from models which averaged across all black women's skill terciles were close to one in addition to being non-significant (Table 3). Associations with employment by skill, in contrast, reveal positive but non-significant associations among the lower two terciles of black women (Table 6).

Discussion

Within demography and public health, there exists extensive research on pregnancy intentions. This body of work focuses almost exclusively on unintended pregnancy. It is largely descriptive, and shows that pregnancy is associated with demographic groups who score lower on measures of economic security and health. We are aware of no research on employment outcomes. However, existing research, because it shows that unintended pregnancy is associated with negative outcomes, might lead us to expect that planned pregnancies are beneficial to women's employment.

Access to contraception has been shown to contribute to improvements in women's educational attainment, entry into professional occupations, and higher earnings. Presumably women use contraception to avoid become pregnant until they decide that it is the right time to do so. Thus, the logic behind the economic literature would seem to suggest that planning first births contributes to higher employment and earnings among women. We referred to this as Hypothesis 1 because we think that for many researchers, this may be the default assumption.

However, a substantial body of work within sociology and economics finds that motherhood in and of itself adversely affects women's employment and wages (Bailey, Hershbein, and Miller 2012; Bailey 2013; Goldin and Katz 2000, 2002), and scholars have theorized that these associations are largely due to structural obstacles. Additionally, several qualitative studies

have documented the tensions between work and family that mothers face (e.g., Gerson 1986; Stone 2008). It is not apparent if family planning could address these obstacles.

We therefore posited that, due to the tension between work and motherhood, a woman might be more likely to feel that it was the right time to have a child if she was able to disinvest, either partially or fully, from the labor market. We found some support for this expectation, though only for some outcomes and only for white women.

The most substantial evidence of this is in our analyses of white women's employment. We found that white women with mistimed births (the second largest group after planned) were more likely to be employed, compared to those whose first births were planned. This pattern is not limited to "professionals." This association was seen among employees at both skill levels and was maintained after including a robust set of controls, including person-fixed-effects, total fertility, marital status and husband's earnings.

It is possible that white women who plan births do so with the expectation of exiting the labor market, at least for a few years, or exit in response to work-home tension. These patterns may reflect offsetting economic considerations, such as the cost of childcare, as well as sociocultural norms that reinforce female domesticity. Further research is needed to tease out these mediating factors.

In models estimating white women's hours, the coefficient for mistimed was marginally positive when averaging across all skill levels, but, results by skill suggest that this association may be limited to women in the low-mid skill category. This suggests that among high skill white women who remain employed, or resume employment, planning status does not matter. It is possible that women with mistimed first births work more hours among those in the low-mid skill category due to economic circumstances, such as not being able to reduce their time spent in the labor markets relative to similar low-mid skill women able to plan their pregnancy.

We did not find strong associations between planning status and white women's wages. The only significant association was among the small proportion who indicated that they did not want children. This population could be less willing to reduce labor market commitment, but, this would predict differences in the employment and hours estimates. It is possible that their strong response to the pregnancy intentions question could reflect a strong commitment to career which could predict to higher wages.

Whereas the overall pattern of results for white women is consistent with Hypothesis 2, for black women, we found marginal support for Hypothesis 1, but only as this applies to the small group that indicated their first birth was unplanned but wanted. These women also earned lower wages and, below the top skill tercile, worked fewer hours. We also found this relationship among the small proportion of high-skill white women who had an unplanned but wanted first birth. This population may be distinctly different from the other three. For example, women whose first births were unplanned but wanted were less likely at baseline to report wanting to work, and more likely to report wanting to be "married, raising a family" than

women who had planned, mistimed or unwanted first births (Figure 2a). In turn, while these women may not have planned the pregnancy, per se, they may have been motivated to exit the labor market and reduce their hours of employment because of a long-standing commitment to prioritizing family obligations over work.

Limitations

The conventional measure used to assess pregnancy intentions in the large body of sexual and reproductive health research has been criticized for being imprecise, one-dimensional and for not taking the affective component of pregnancy reactions into account. Our measure of birth intentions is an improvement on the conventional one—for example, it takes contraceptive use and pregnancy planning into account—but it is not without shortcomings. Barrett and colleagues (Barrett & Wellings 2002; Barrett et al 2004) show that many women may not use the word “planned” to describe a birth unless they engaged in preparatory behaviors such as having discussions with their partners in addition to trying to become pregnant. Our measure of planning likely includes women who did not explicitly engage in these planning behaviors. If there exists a subset of women who, through extensive planning, *were* able to mitigate the tension between work and family, then our estimates may be conservative.

Pregnancies to teenagers are more likely to be unintended than pregnancies which occur later, and some research has found that teenage fertility has negative economic consequences (e.g., Diaz & Field 2016). Our analysis partly addresses this issue by excluding person-years in which women are enrolled in school. Considering that teenage fertility has been negatively associated with women’s education and earnings, and we find that unplanned births are positively associated with the probability of employment, these competing dynamics would mean that our findings are slightly conservative.

Another limitation of our analysis is that we do not observe the reasons that, at a particular time, a woman does or does not plan to have her first child. Given the sociocultural norm of the male breadwinner, we acknowledge that it is conceivable that some women may simply prefer not to work, and it is possible that this preference is higher among women who plan their first births. If any woman has such a time-invariant preference, it is addressed with the fixed effects. Women’s preferences may change over time, however. Addressing the potential that a woman’s ability to exercise this preference is contingent on her marital situation, we note that we found that the moderating effect of birth planning on the association between motherhood and employment remained substantial and significant in models which adjusted for marital status and the earnings and hours of the spouse.

Additionally, although we do not know how individual women’s attitudes toward market work and childrearing evolve over time, we *were* able to analyze baseline measures of women’s attitudes toward work and family. The vast majority of women indicated that they would prefer to work (Figure 2). Moreover, we found no significant differences between women who planned their first birth, and women who had mistimed or unwanted first births.

We measured skill using the same data and test used in at least two prior analyses of motherhood and earnings (England et al 2016; Wilde et al 2010). Standardized test scores are an imperfect proxy for cognitive skill as they also reflect socioeconomic inequality, but as England and colleagues have shown, high-skill women in the NLSY experience the highest returns to experience. Additionally, some contend that standardized tests contain implicit racial bias. However, since we group women into terciles by race, this should not affect our findings.

Finally, this analysis only addresses pregnancies that resulted in first births and does not take abortion into account. Some women may have terminated a first pregnancy specifically because they wanted to improve their employment outcomes, for example, if the pregnancy occurred before they had finished school or came at a time that was detrimental to their employment opportunities. Consistent with this view, prior research has found that women with lower levels of educational attainment who have not yet had children are least likely to abort their first pregnancy while college educated women are most likely to do so (Trent & Powell-Griner 1991). Similarly an analysis of the NLSY by suggests that the consequences of teen births are most substantial for those women who have the smallest propensity to give birth during that period, which suggests limited if any opportunity costs to those who experience teen births in practice (Diaz & Fiel 2016).

Conclusion

Our study provides further insights into the dynamics that contribute to the impact of motherhood on women's employment. Research suggests that access to contraception empowers women to control their fertility, presumably by allowing them to plan their births, and contributes to improvements in education and earnings. However, our study suggests the relationship is more complex for the individual women who experience them.

There are a number of factors that influence when women choose to become mothers, including the ability to disinvest in the labor market. Our findings could suggest that family planning enables women to invest in their education and career before becoming mothers but that planning does little to address the structural factors which contribute to the negative impact of motherhood on women's employment. It is also possible that women "choose" to disinvest in the labor market. However, as prior research has suggested, the sociocultural forces which constrain women's choices are a structural problem.

There is an irony to our findings. Contraception can help women control their fertility, but prior research on the association between socioeconomic disadvantage and unintended pregnancy suggests that it is more typically practiced this way by women who are already better off. In turn, we find that mistimed first births are positively associated with white women's employment outcomes relative to planned ones.

In order to reduce the impact of childrearing on women's employment, we suspect that access to family planning needs to be complemented with larger structural changes. Much previous research has examined heterogeneity in the impact of motherhood by women's background

characteristics. However, women's individual decisions to become mothers should not be neglected. This evidence can inform policy makers as efforts are formulated to ensure that women have the tools to fulfill their fertility and professional goals.

Figure 1. Diagram of how pregnancies are classified into intention categories

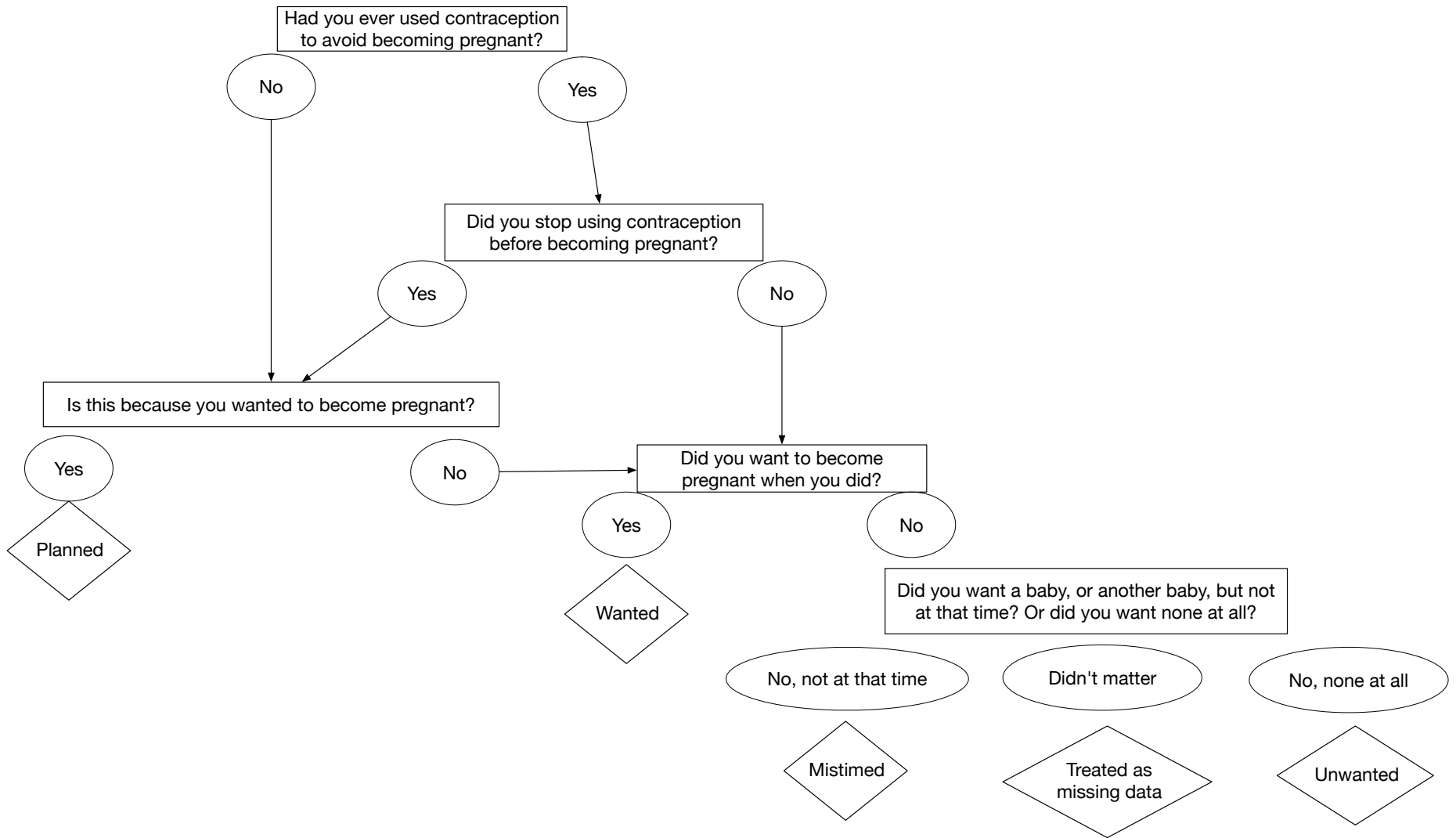
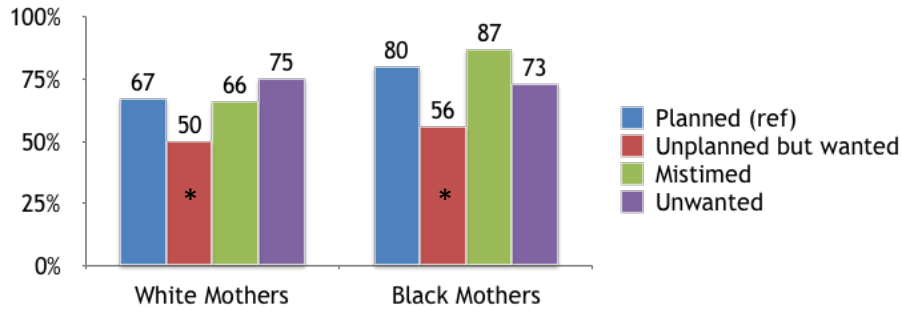


Figure 2a. (view in color)

Percentage who responded “Working” rather than “Married, raising a family” when asked “What would you like to be doing when you are 35 years old?” by the planning status of their first birth



Note: Planned (ref)

* $p < .05$, two-tailed test

Figure 2b. (view in color)

Of those who responded “Married, raising a family,” percentage who responded “Yes” when asked, “Would you also like to be working?”

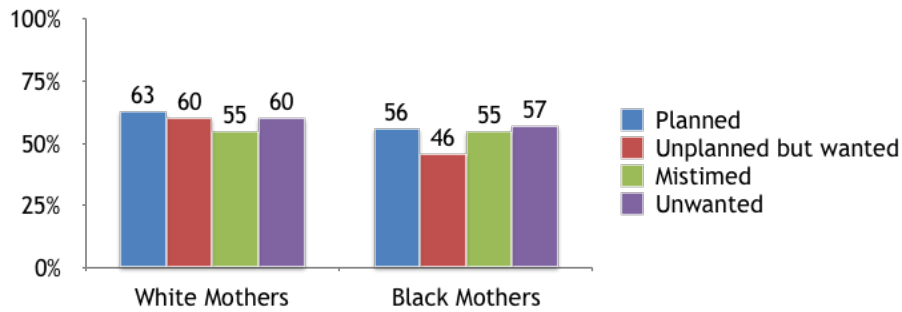


Figure 3. (view in color)

Proportion of women employed, and proportion of women employed full-time, by race and whether the first birth was planned

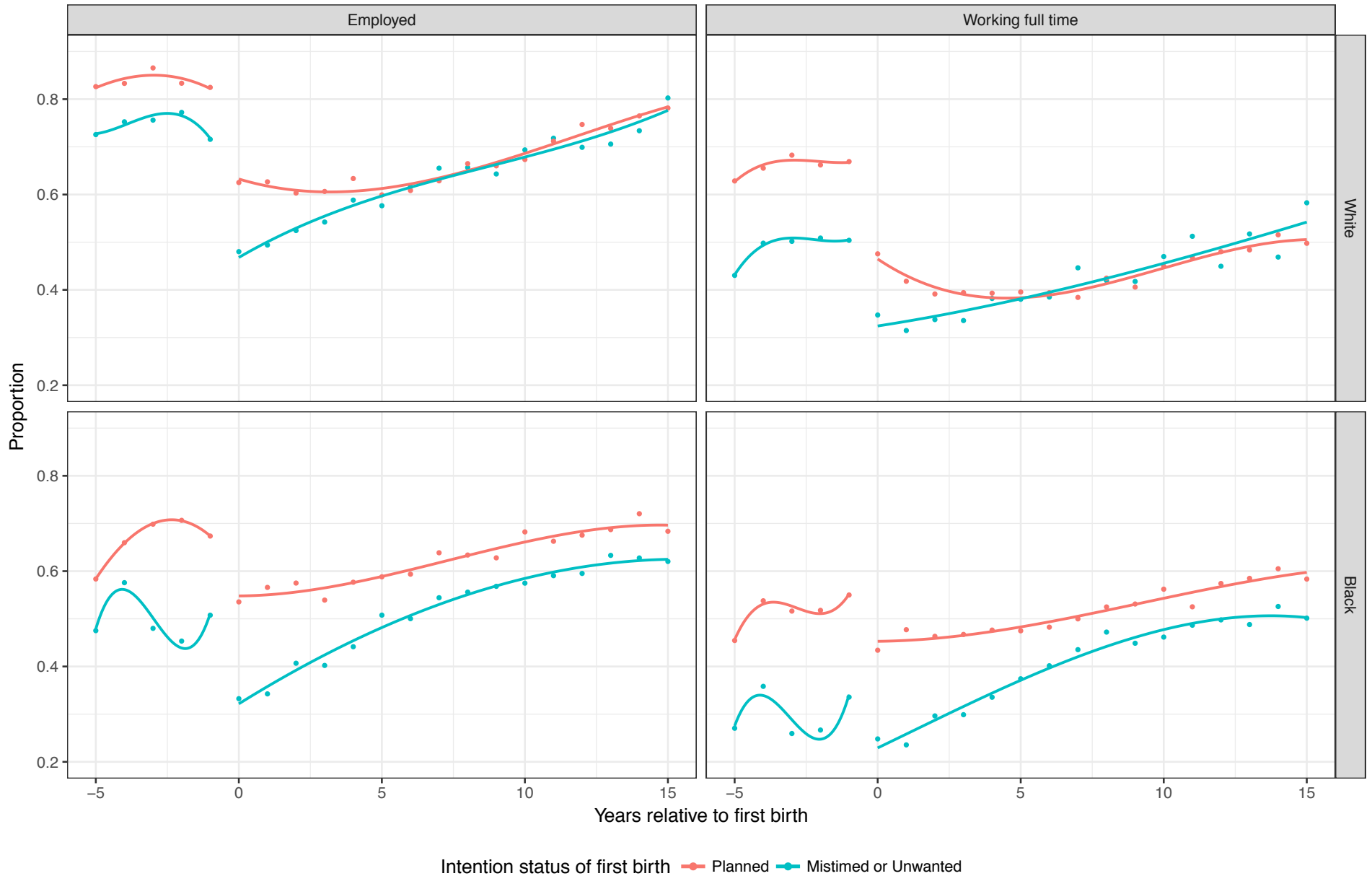


Table 1. Proportions of First Births Planned and Unplanned by Race

	White Women	Black Women
Planned	0.67	0.34***
Unplanned		
Wanted	0.06	0.08*
Mistimed	0.24	0.44***
Unwanted	0.04	0.14***

*** $p < .001$ ** $p < .01$ * $p < .05$ ^ $p < .10$, two-tailed tests

Table 2. Means for the 2014 Survey Wave, by Race and Planning Status of the First Birth

	White Mothers		Black Mothers	
	Planned	Mistimed or unwanted	Planned	Mistimed or unwanted
Employment				
Not employed	.25	.27	.31	.36
Employed part-time	.12	.12	.04	.07
Employed full-time	.63	.61	.65	.57^
Wages (earnings per hour)	\$22.72	\$19.91*	\$20.68	\$18.58

Table 3. Odds ratios from models estimating employment

	White women			Black women		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Planning						
unplanned but wanted	1.27	1.27	1.17	1.38	1.37	1.37
mistimed	1.82***	1.82***	1.64***	0.98	0.98	0.97
unwanted	1.88^	1.75^	1.49	1.31	1.32	1.29
Years since first birth						
Not Yet Had Birth (ref)						
First 4 years after 1st birth	0.13***	0.14***	0.17***	0.37***	0.37***	0.37***
Years 5-9 after 1st birth	0.15***	0.18***	0.23***	0.46***	0.47***	0.48***
Years 10+ after first birth	0.33***	0.43***	0.52***	0.59*	0.61*	0.63*

*** $p < .001$ ** $p < .01$ * $p < .05$ ^ $p < .10$, two-tailed tests

Notes: Model 1 includes person-fixed-effects, year, age, educational attainment, age x educational attainment, and geography. Model 2 also controls for additional children, while Model 3 adds marital status, spouse's annual earnings and hours.

Table 4. Regression coefficients from models estimating hours

	White women			Black women		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Planning						
unplanned but wanted	1.83 [^]	1.88 [^]	1.39	-3.36*	-3.40*	-3.57**
mistimed	1.39*	1.39*	1.11 [^]	-0.30	-0.29	-0.38
unwanted	2.97 [^]	2.24	1.98	0.71	0.71	0.58
Years since first birth						
Not Yet Had Birth (ref)						
First 4 years after 1st birth	-6.08***	-5.87***	-5.13***	-1.03*	-1.05*	-0.89 [^]
Years 5-9 after 1st birth	-6.82***	-5.57***	-4.91***	-1.43**	-1.36*	-1.19*
Years 10+ after first birth	-5.28***	-3.46***	-2.93***	-1.40*	-1.27*	-1.12 [^]

*** p < .001 ** p < .01 * p < .05 [^] p < .10, two-tailed tests

Notes: Model 1 includes person-fixed-effects, year, age, educational attainment, age x educational attainment, and geography. Model 2 also controls for additional children, while Model 3 adds marital status, spouse's annual earnings and hours.

Table 5. Regression coefficients from models estimating log wages

	White women			Black women		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Planning						
wanted unplanned	-0.04	-0.04	-0.04	-0.15*	-0.16*	-0.16*
mistimed	0.01	0.01	0.02	0.04	0.04	0.04
unwanted	0.23**	0.22*	0.22*	-0.06	-0.06	-0.05
Years since first birth						
Not Yet Had Birth (ref)						
First 4 years after 1st birth	-0.06***	-0.06***	-0.06***	-0.02	-0.02	-0.03
Years 5-9 after 1st birth	-0.15***	-0.12***	-0.12***	-0.01	-0.00	-0.01
Years 10+ after first birth	-0.19***	-0.15***	-0.15***	-0.06	-0.03	-0.04

*** $p < .001$ ** $p < .01$ * $p < .05$ ^ $p < .10$, two-tailed tests

Notes: Model 1 includes person-fixed-effects, year, age, educational attainment, age x educational attainment, and geography. Model 2 also controls for additional children, while Model 3 adds marital status, spouse's annual earnings and hours.

Table 6. Estimates predicting employment and hours by skill from Model 3

	White Women				Black Women			
	Odds Ratios for Employment		Number of Hours		Odds Ratios for Employment		Number of Hours	
	Low-Mid	Top Tercile	Low-Mid	Top Tercile	Low-Mid	Top Tercile	Low-Mid	Top Tercile
Planning								
wanted unplanned	1.61 [^]	0.22 ^{***}	2.45 [*]	-2.89	1.35	1.34	-3.51 [*]	-3.69
mistimed	1.56 ^{**}	2.02 [*]	1.48 [*]	-0.09	1.29	0.61	-0.31	-0.45
unwanted	1.37	1.78	1.79	2.38	2.04	0.69	2.40	-1.47
Years since first birth								
Not Yet Had Birth (ref)								
First 4 years after 1st birth	0.19 ^{***}	0.14 ^{***}	-4.43 ^{***}	-6.42 ^{***}	0.35 ^{***}	0.41 ^{**}	-0.52	-1.47 [^]
Years 5-9 after 1st birth	0.25 ^{***}	0.17 ^{***}	-4.26 ^{***}	-6.20 ^{***}	0.48 ^{***}	0.49 [*]	-1.60 [*]	-0.49
Years 10+ after first birth	0.57 ^{***}	0.33 ^{***}	-2.49 ^{***}	-3.68 ^{***}	0.63 [^]	0.70	-1.50 [^]	-0.32

*** p < .001 ** p < .01 * p < .05 ^ p < .10, two-tailed tests

Appendix Table 1. Proportions of First Births Planned and Unplanned by Race & Skill

	White Women		Black Women	
	Low-Mid Skill	High Skill	Low-Mid Skill	High Skill
Planned	0.64	0.73**		
Unplanned			0.31	0.40*
Wanted	0.06	0.05	0.09	0.08
Mistimed	0.27	0.18**	0.46	0.40
Unwanted	0.04	0.04	0.15	0.12

*** p < .001 ** p < .01 * p < .05 ^ p < .10, two-tailed tests