UNDERSTANDING HOW BIRTH SPACING INFLUENCES THE EMPLOYMENT DECISIONS OF AT-RISK, UNMARRIED MOTHERS AFTER THE BIRTH OF A SECOND CHILD

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UNDERSTANDING HOW BIRTH SPACING INFLUENCES THE EMPLOYMENT DECISIONS OF AT-RISK, UNMARRIED MOTHERS AFTER THE BIRTH OF A SECOND CHILD

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ABSTRACT

Returning to work after giving birth is uniquely important to unmarried mothers, who rely more heavily on their income than married mothers, who have, on average, higher household incomes. One understudied effect in unmarried mothers’ employment status is the number of months between the births of the first and second child. To better understand if birth spacing impacts single mother’s employment, I used data from the NLSY79 of unmarried mothers who gave birth to their first child before the age of 22 and went on to have a second child between 1980 and 2006. I conducted a survival analysis using Cox proportional hazard regressions to determine the risk of entering or returning to the workforce within a year following the second birth. I found that while spacing children more than 77 months apart is associated with a higher risk of entering the workforce when testing just birth spacing effects, these effects disappear net of controls for previous income, age and work history. This suggests that women who have children farther apart are also more likely to have characteristics associated with returning to work after giving birth. I also found that being employed before the second child is born is highly correlated with returning to or entering the workforce within twelve months of the birth. This suggests that policies that allow women to stay employed while pregnant could be helpful in encouraging single women to return to the workforce after having a second child.
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Introduction

While the majority of children in the United States live with two parents, the number of children living with just their mother has been steadily increasing. In 1960, just 8 percent of children lived with only their mother. By 2016, 23 percent of children did (Porter, 2016).

Households headed by single mothers are more likely to live in poverty compared to households headed by single fathers or married couples (Semega, Fontenot, & Kollar, 2017). There are a multitude of reasons of why single mothers have such high poverty rates. Unmarried mothers, living without partners, are likely to have less household income than two-earner married couples. Single mothers also have, on average, lower educational attainment rates than women without children and are often employed in low-wage jobs. When it comes to laborforce decision-making of single mothers following the birth of a child, the cost of childcare relative to low take-home pay minimizes the opportunity costs for staying out of the workforce for single mothers (Schochet & Rangarajan, 2004; Desai & Waite, 1991). Nonetheless, a single mother who elects, out of necessity or preference, to return to work following the birth of her first child often lack structural supports, including flexible work schedules, paid leave and other benefits, along with a co-parent’s assistance with childrearing, which are often enjoyed by her married counterpart (Lee, 2004; Kane, Morgan, Harris, & Guilkey, 2013). The challenge is likely compounded after a second child is born.

Even in the case of married mothers, the birth of a second child is often the “tipping point” for feeling overwhelmed by the demands of work and family responsibilities, making them less likely to stay in the workforce or go back to work (Casserly, 2011). Although there is some debate about the advantages of time at home with children, single mothers living near or
below the poverty line are not in a position to make that choice. Yet, the cost of having two children in childcare can be prohibitive for those with low earnings. A question that has received scant research attention is the effect of birth spacing on whether and when a single mother returns to work following the birth of her second child.

It is possible a mother with children born close together may be able to more quickly return to work, since she likely already has a child care system in place that can be used for the second child. Alternatively, having child spaced far apart may help the mother since an older child may require less attention and has more public child care options.

To further understand how birth spacing affects how quickly a mother returns to work, I used a survival analysis to examine the employment patterns of single mothers who gave birth to their first child before the age of 22. Because older mothers on average have higher wages and more education, older mothers are often in a better position when they give birth to an additional child (Kane et al., 2013). Instead, by focusing only on mothers who are most at risk to the effects of being a single mother, we can see what factors are associated with returning to work sooner and if birth spacing impacts the employment decisions of single mothers. Using data from the National Longitudinal Survey of Youth 1979 (NLSY79) of single mothers who gave birth to their second child between 1980 and 2006, I use a Cox proportional hazards regression model to create a survival analysis to determine if the birth spacing between children influences a mother’s risk of returning to the workforce after giving birth. I also include demographic, education and work-related controls to narrow down other possible influencers.

The results of the present study may have implications for policy. To the extent that birth control and other family planning methods allow women to plan the timing of subsequent births,
it may be instructive to understand the difference that birth spacing can make in the likelihood of returning to work. This could be one way to improve the lives of single mothers planning to work, by helping women return to work earlier.
Review of the Literature

The opportunity costs of not working

When making the decision to return to work after giving birth, the opportunity costs of lost wages play a large role. Women in positions with high wages or in jobs that require high education or specialized job-skill training have been found to be more likely to return to work after the birth of their first child (Desai & Waite, 1991). On the opposite end, nonwage income, such as government benefits, have been shown to decrease the rate of employment of mothers (Killingsworth & Heckman, 1986; Joesch, 1994).

These findings negatively impact single mothers on average. Overall, single mothers have been found to have lower rates of educational attainment compared to unmarried women without children (Kane et al., 2013). Giving birth as a teenager is associated with a lower likelihood of completing high school and increases the likelihood that a woman will receive government cash benefits (Fletcher & Wolfe, 2008). Single mothers are also less likely to enroll in or complete college compared to both women without children and married mothers (Kruvelis, Cruse, & Gault, 2017).

Less education is often tied with low-wage positions. Looking at households from 1995 to 2000, Peter Schochet and Anu Rangarajan (2004) found that 44 percent of employed single women with children had low-wage jobs (defined as less than the hourly wage of a full-time worker whose annual earnings are at the poverty line for a family of four) compared to 36 percent of married women with children.

More recently, in 2016, 26.6 percent of households headed by unmarried women were below the poverty line, compared to 13.1 percent of households headed by single fathers, and 5.1
percent of married households. There are further differences based on race. Of all white, non-Hispanic single-mother-households, 21.1 percent are at or below the poverty line, while 31 percent of black households headed by single mothers are at or above the poverty line, and 32 percent of Hispanic households headed by single mothers are in poverty (Semega et al., 2017).

Additionally, among low-income mothers, women who have access to health insurance through their employer, and in their own names, are much more likely to remain in their jobs after giving birth compared to mothers with other types of health insurance. Low-wage-earning mothers are also less likely to have access to employer-provided health insurance: 28 percent did not have access to health insurance through their employers, compared to 5 percent of higher-income working mothers (Lee, 2004).

Lastly, Jutta Joesch (1994) found that among other factors, a mother’s non-wage income, such as government benefits, has a negative impact on her participation in the labor force. These results may not hold up, however given changes in the welfare law that imposed work requirements. The Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA) of 1996 changed the U.S.’s welfare system, creating a state block-grant program Temporary Assistance for Needy Families to replace Aid to Families with Dependent Children (AFDC). The new law imposed time limits and mandated employment as part of the eligibility requirements for receipt of government benefits. Single parents must work at least 20, and later 30, hours per week to revive TANF benefits.

Additionally, the Earned Income Tax Credit (EITC), which had been created in 1975 but expanded in 1996, is available only to working families, especially families with children. The result was a large increase in the number of single mothers working full time, from 61.7 percent
of all single mothers in 1995 to 73.0 percent of single mothers in 2000 (Sherman, Fremstad, & Parrott, 2004). The new program also allowed states to use these funds for child care purposes, which both increased the amount of childcare subsidies and further encouraged single mothers to work (Tekin, 2007). However, research has found that the increase in employment was due in larger part to EITC, and less so to an increase in child care subsidies (Meyer & Rosenbaum, 1999).

**Predictors of return to work**

Among the factors associated with the likelihood of employment after the birth of a child are having held a job before giving birth, having high wages and benefits and the ability to take time off without being penalized, and having a position to return to (Berger & Waldfogel, 2004). Given that single mothers are less likely to work while pregnant and less likely to have access to paid leave the odds that they will return to work post-childbirth are lower than those of married mothers (Laughlin, 2011; Berger & Waldfogel, 2004; Klerman & Leibowitz, 1994).

Using data from 2006 to 2008, the U.S. Census Bureau found that 82.7 percent of women who gave birth to their first child before marriage were employed during the third month before giving birth. The comparable figure for married women was 89.4 percent. The gap is more extreme the month before giving birth, as 58.6 percent of unmarried mothers worked the month before giving birth compared to 68.1 percent of married mothers. Similar trends follow young and less well-educated mothers. Women who gave birth after the age of 22 had higher rates of working while pregnant, as well as women who completed high school and college (Laughlin, 2011).
Single mothers are also much more likely to quit their jobs as a leave arrangement when they give birth. The U.S. Census Bureau found that 5.2 percent of married mothers quit their jobs to take time off to have a child compared to 29.9 percent of single mothers. Mothers under the age of 22 and mothers with less than a high school degree are also much more likely to report quitting their jobs to accommodate having a baby (Laughlin, 2011).

However, single mothers also reported having higher rates of both unpaid and paid leave compared married mothers. Of single mothers who worked during the pregnancy of their first child, 47.1 percent reported having access to unpaid leave, while 39.4 percent had access to paid leave. Of married mothers, 29.4 percent had access to unpaid leave, and 28.6 percent had access to paid leave (women could select multiple options). Unpaid leave in this scenario includes unpaid maternity, sick and vacation leave (Laughlin, 2011).

Some research has found that maternity leave increases the likelihood both that a woman will take leave after giving birth and will return to work more quickly after birth compared to mothers who were not offered maternity leave (Berger & Waldfogel, 2004). However, other research examining the effects of the Family and Medical Leave Act of 1993, which required that employers offer unpaid maternity leave of 12 weeks to women who have worked at least 12 months before giving birth, found that maternity leave has little effect on returning to work. Klerman and Leibowitz (1994) examined the effect of the new laws and found that even before maternity leave laws were enacted, mothers who had high education levels were more likely to work during pregnancy than mothers with lower levels of education, and thus were likely to return to work regardless of maternity leave laws.
The effect of childcare

Finally, how quickly a woman can return to work after giving birth to her second child depends on finding adequate child care while she works, and thus child care subsidies, living with a parent and flexible work schedules have all been found to increase employment among mothers after giving birth.

Living with a parent may allow women to return more quickly, as low-income working mothers with children under 15 are most likely to use informal child care, such as relative or parental care, to watch their children (Lee, 2004). Jonathan Pingle (2005) found that states that penalize single mothers who live with their parents by reducing government benefits have lower rates of intergenerational living arrangements, and lower rates of employment of single mothers. Even if a mother doesn’t live with her children’s grandparent, as Josefina Posadas and Marian Vidal-Fernández (2012) found, mother’s employment still falls after the death of a maternal grandmother if the grandmother was a childcare provider.

Informal child care is not only more affordable than paid childcare, but it may allow single mothers to work unpredictable or nontraditional work hours. The majority of low-income mothers who work are employed in the service industry, and low-income mothers are more likely to work night shifts and less likely to work during the day than high-income mothers. (Desai & Waite, 1991; Schochet & Rangarjan, 2004; Lee, 2004).

Mothers who cannot rely on family members are more likely use paid child care instead, the high cost of which can impede mothers from working (Ahn, 2012). For mothers who work full-time and pay for child care, both an increase in wages and a decrease in the price of child care are associated with an increase of paid child care and an increase in employment (Tekin,
Higher child care costs decreases employment of both married and single mothers, but especially single mothers (Han & Waldfogel, 2001).

For low-income women, living in a rural area has more barriers to high wage jobs than living in an urban area. Low-income rural-resident mothers who rely on paid child care have limited options for child care and other public resources, such as public transportation (Urban & Olson, 2005).

It is also important to note that while single mothers are not married, this does not mean that they do not have partners who provide financial help or co-parenting support. However, father involvement of unmarried couples tends to decrease over time. Laura Tach, Ronald Mincy and Kathryn Edin (2010) found that while half of unmarried couples who gave birth a child were living together during the child’s birth, by the time the child is five years old, only 38 percent of couples were still living together, and 26 percent reporting having no relationship at all. Financial support also diminished over time.

**How an additional child affects a mother’s return to work**

As a whole, research has found that the birth of an additional child has a negative, but small effect on the mother’s labor supply, but the effect is larger for young women or women who have low education levels (Angrist & Evans, 1998).

Angrist and Evans (1998) looked at the impact of a third child on American married mothers’ labor supply and found the third child leads to a decrease in labor participation for all women, but the effects are much stronger for mothers with little education. In a study of twins’ births in the U.K., Hupkau & Leurcq (2016) found that among low-income mothers, having more
than one child reduces the likelihood of employment in a long-term, part-time job compared to those who only had one child. However, having a second child has no effect on the employment of intermediate or high-income mothers (2016). Hupkau and Leturcq also found different reasons behind why low-income and high-income women only have one child. Among high-income women the choice to have an only child is related to their careers, whereas low-income women are more likely to break up with a partner, preventing them from having additional children.

**How birth spacing affects a mother’s return to work**

While single mothers and married mothers differ on priorities and characteristics, research has also found that single mothers space their children differently than married mothers. In addition to having more children (Lee, 2004; Laughlin, 2011), unmarried women in the U.S. who have a third child do so more quickly than married women with more than two children (Curtis & Waldfogel, 2009). Despite this, much of the research on how birth spacing affects a mother’s return to work has been focused on married mothers.

Kenneth Troske and Alexandru Voicu (2013) looked at the spacing of a second child on a married mother’s employment, and found that the longer a mother waits to have a child is associated with a larger probability of returning to the workforce. However, having a second child is also correlated with a decreasing likelihood of working full-time, and an increasing likelihood of working part-time. This suggests that as a mother takes time between the two children, she will reduce her hours at work in order to take more time to provide child care. But because married mothers and single mothers have different levels, on average, of education and previous wages, it is possible that the birth of a second child, and more specifically, the number
of months in between the births of the two children, affect single mothers differently than married mothers.

**The present study**

While Troske and Voicu examined the effects of spacing on married mother’s employment status, there still remains the question of if birth spacing influences the employment decisions of single mothers. To continue this research, I use a sample of mothers who gave birth to two children and were unmarried when they gave birth to their second child. Additionally, to narrow in on women who are most at-risk and may benefit from birth spacing effects, I narrowed the sample to mothers who gave birth to their first child before the age of 19.
Data and Methods

Data source

The data used in this paper is from the National Longitudinal Survey of Youth 1979 (NLSY79), a survey of 12,686 men and women who were ages 14 to 22 in 1979, when the survey began. The respondents were interviewed every year from 1979 to 1994, and every other year from 1994 until now. The survey has been sponsored by the Bureau of Labor Statistics and is primarily focused on the individual’s employment decisions, beginning from when they were in high school or college onward. One advantage of this data set is that it asks respondents about their weekly employment status. Since many low-income workers have lower job tenures than high-wage workers, this provides a much more accurate picture than annual employment data (Lee, 2004).

To find the sample, interviewers used a list of housing units in the U.S., and went to a random sample of these homes to interview each member of the household, collecting information on more than 155,000 people. Of these, people who were 14 to 21 years old on December 31, 1978 were asked to participate in the first NLSY79 interview and were placed into three groups: non-institutionalized, civilian Americans born between 1957 and 1964 (n = 6,111), civilian Hispanic, black and low-income white youth born between 1957 and 1964 (n = 5,295), and youths born between 1957 and 1961 who were enlisted in the military on September 30, 1978 (n = 1,280).

Until 1993, retention rates for all three NLSY79 samples were more than 90 percent. From 1994 to 2000, retention rates fell to 80 percent, and since 2002 have been between 70 and 80 percent. However, some subsamples were dropped due to budget constraints: 1,079 of the...
military subset were no longer interviewed beginning in 1984, and 1,643 white respondents of the civilian Hispanic, black and low-income white youth sample were no longer interviewed beginning in 1991 (“The NLYS Sample”).

**Analysis sample**

To understand the effects of birth spacing on the timing of returning to work on at-risk single mothers, this analysis sample consists of women who were not married when they gave birth to their second child, and who gave birth to their first child before the age of 21 or younger. Since the NLSY became biennial after 1994, we do not have the status of a woman’s marital status during the year she gave birth if she gave birth during an interim year. Instead, women who were married in the year prior to giving birth were excluded from the sample.

To have the largest sample possible, data from 1980 until 2006 was used. Although the survey begins in 1979, this year was dropped from the analysis because there was no information on the prior year, for example employment status and wages. Additionally, although some women did not have a second child until 2011, 99.83 percent of women in the sample had given birth to their second child by 2006. This was a sufficient interval to provide a wide distribution of birth spacing.

Because we are studying birth spacing, the eight women who gave birth to twins as their first two children were eliminated, since having twins is not an intentional decision to space children as close together as possible. In total, the sample was reduced to 1,091 women. However, when women who had any missing variables were eliminated, the sample was further reduced to 543 women.
Table 1 provides means and standard deviations for all variables used in this analysis. Among the 543 women sampled, fewer than a quarter were ever married (24 percent) and roughly one in five is in a relationship (20 percent). Fifty-six percent of the mothers were employed in the previous year. Interestingly, the average amount of Aid to Families with Dependent Children (AFDC) – $6,823.69 – is more than double the average income received in the previous year ($3,325). This suggests that at-risk mothers rely more heavily on government benefits than earned or other income. It bears noting that the timing of many births in this study pre-dated the 1996 Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA), which imposed work requirements on recipients. It is likely, therefore, that welfare-recipient mothers of children born after 1996 would receive lower amounts of Temporary Aid to Needy Families (TANF), on average.

About half of women, 51 percent, received health insurance from their employer in the previous year. Forty-nine percent either were not employed, or were employed but did not receive health insurance from their employer.

On average, the age the women sampled gave birth to their first child is 18.14 years old, and the average age the women sampled gave birth to their second child is 23.11 years old, making the average spacing of births between the two children 4.97 years.

Thirty-six percent of women sampled lived with their mother during the time that they gave birth to their second child, and 60 percent lived with their mother when they were 14.

Sixty-one percent of the sample completed 12 years of high school, while just 2 percent completed four years of college.
In terms of race and ethnicity, 60 percent of the mothers in the sample are black, 15 percent identify as Hispanic, and 26 percent are neither black nor Hispanic. The at-risk women in this study are more likely to live in urban areas.

**Dependent and key independent variables**

**Dependent variable**

For each week from 1979 until the current year, respondents are asked about their work history since the previous interview. During the weeks the respondent is employed, their week is coded as the number of that job for that year, up to 10 jobs. During weeks when a respondent is not working, a week is either coded as either “unemployed” if the respondent claims to be looking for work, or “out of the labor force,” if they are not looking for work. Sixty cases were ambiguous concerning labor force status. Weeks can also be coded as “employed, but not attached to a specific job.” Respondents who serve in the military are assigned a separate code if they are on duty.

To characterize the first week a woman goes back to work, her employment status was divided into three options: 1) “Employed,” if she has a job ID code, is employed but not attached to a job, or is on active military duty; 2) “unemployed,” if she reports looking for a job or labor force status is ambiguous; and 3) “out of the labor force,” if she is not working and not looking for a job.
**Key independent variable**

To determine if birth spacing influences the week a mother returns to work, women were placed into categories based on the number of months between giving birth to their first and second child. Of the women in the sample, 60 percent gave birth to children less than 4.75 years apart, but some waited fifteen or more years before having their second child. To ensure that dividing up the types categories did not bias the results, I tested the sensitivity of the results to a variety of alternatives and found them to be robust. Therefore, I divided the distribution of gap between first and second births into quintiles, which gives us: 20 months or less apart; between 21 and 35 months apart; between 36 and 53 months apart; between 54 and 77 months apart; and more than 78 months apart.

**Control variables**

**Education**

Respondents are asked each year what the highest grade of education they had in May of that survey year. I created one dummy variable for those who had completed 12 years of high school as of the year they gave birth to their second child and a second dummy variable, coded 1 if they completed four years of college.

**Access to work and opportunity costs**

In each survey year, respondents over the age of 18 report their personal income of the previous year from wages, salaries, commissions or tips from all jobs, before tax deductions. In this sample of unmarried, single mothers, nearly 40 percent of respondents reported no income in
the previous year. To normalize the distribution, the log of a respondent’s previous annual income was used.

Unlike income (reported for calendar year), the NLSY asks respondents for weekly benefit income, including unemployment insurance, food stamps and Aid to Families with Dependent Children (AFDC) benefits. Since single mothers often receive multiple forms of government aid, only AFDC (and later TANF) benefits are included. A respondent’s AFDC benefits are those added from the 52 weeks prior to giving birth until the week of giving birth. Similar to wages, about 50 percent of respondents received no AFDC benefits. To normalize the distribution, the log of AFDC benefits was used for analysis.

Using the same categories as in the dependent variable, a respondent is considered “employed prior to birth” if she was employed for at least one week in the year preceding the birth of her second child.

Women who had health insurance were asked if they received their health insurance from an employer or a spouse’s employer. A dummy variable was created depending on if a mother received insurance through an employer, or did not have health insurance or did not receive health insurance through an employer.

Because maternal grandparents often provide informal care, a dummy variable was created based on if a mother reported that her mother lives in the household. Respondents are asked to report all family members she lives with, and I looked at the relationship status of the first six reported household members to determine if a respondent lives with her mother.
Demographics

Since rural mothers have much less access to public childcare and other public resources, I created a dummy variable measuring if a woman lived in a rural area the year she gave birth to her second child. Before 1996, respondents were coded as urban if the county they lived in had a city with more than 50,000 people that was more than half of the county population. After 1996, respondents who live in an area with greater than 2,500 population were considered urban.

During the screening interviews in 1978, respondents were asked multiple race and ethnicity questions. Respondents were split into three categories based on their answers: Hispanic, if a respondent is of Mexican, Cuban, Puerto Rican, Latino or Spanish descent, or if the respondent spoke Spanish at home. Black, if the respondent identified as African-American and not Hispanic, and Nonblack/Non-Hispanic, if a respondent identified as neither of these, all of which were included in the 1979. While more detailed racial and ethnicity questions were asked later in the survey, the racial and ethnicity question of 1979 has the least missing variables and was used for this analysis (“Race, Ethnicity and Immigration Data”).

To test for general family stability while growing up, I included dummy variables for living with a biological mother at age 14 and having a mother who worked at age 14. In 1979, respondents were asked who they lived with at the age of 14.

Although the analysis sample was restricted to unmarried women, it is still possible some are in a relationship with the child’s father or another boyfriend. A dummy variable was created for respondents who report that they are in a relationship during the time of the survey.

Of women who were not married when they gave birth to their second child, those who reported being widowed, divorced or separated were coded as previously married. All others
were not considered previously married. Partners, or ex-spouses, may both be able to provide financial support or child care, which could affect when a mother chooses to return to work.

Methods

To understand when single, at-risk mothers return to work after giving birth to their second child, I used a survival analysis, which is an analysis of the time-to-event. Typically used in medical research, survival analysis is often used to determine the length of time it takes for a person to experience an event such as death. Respondents who do experience the event are considered “failures,” while respondents who are still surviving after a period of time that is being examined are considered “censored,” or “incomplete,” since it is still possible for them to experience the event after the time period examined. The hazard rate, or probability that a failure will occur given that it has not occurred, is usually compared across different cohorts, such as those who took a medication and those who did not (Mills, 2011).

For our study, the “event” is returning to work, and the time is the number of weeks until the event. Because I only looked at the first year after giving birth to the second child, respondents who did not return after 52 weeks were considered censored cases. Using the nomenclature of survival analysis, those who had returned to work were considered failures and those who were still unemployed or out of the labor force were considered “survivors.”

To determine if birth spacing affects the time that a woman returns to work, I used a Cox proportional hazards model to find the hazard rates of those with different birth spacing:

\[ h_i(\text{week}) = h_0(\text{week}) \times (\beta_1(\text{birth space} = 0-20 \text{ months}))_i + \beta_2(\text{birth space} = 20-35)_i + \ldots + \beta_nx_{in} \]
In this model, \( h_0(t) \) is the baseline hazard rate, or the week of birth. However, because this provides a different hazard rate for each week \( (t) \), the ratio of hazard rates is more commonly used in survival analysis. In this case, to understand if birth spacing has an effect on returning to work, I compared the hazard rates of each birth space category to those in the control group, which gives the hazard ratio:

\[
\ln(h_i(t)/h_0(t)) = \beta_1(\text{birth space} = 0-20\text{ months})_i + \beta_2(\text{birth space} = 20-35)_i + \ldots
\]

If a hazard ratio is above 1, the person in the treatment group has a greater risk of returning to work than the control group.

**Limitations**

*Assumptions and weaknesses in survival analysis*

One assumption in survival analysis is that the hazard ratio is assumed to be constant over time, which could bias the results. Additionally, Cox regression does not provide absolute probability that a woman will return to work, but relative probability of failure, or returning to work. In this case, this allows us to compare birth spacing and other variables to understand what factors are associated with returning to work *more quickly* as opposed to the number of weeks a mother is unemployed for before returning to work.

Beyond survival analysis, for almost all studies looking at mother’s employment patterns there is the problem of selection bias. Women who anticipate having children may have weak
ties to the labor force and lower wages or participation rates even before becoming mothers. A clever statistical strategy used by Lunborg, Plug, & Rasmussen (2017) to circumvent this selection bias problem was to use a sample of women using IVF treatment and compare labor force outcomes for those who did and did not become pregnant. They found that even after accounting for unobservable characteristics associated both with wanting a child and work force behavior, there is still an effect of a child on a mother’s employment patterns and wages.

Weaknesses in data

Because the NLSY79 became biennial after 1994, data from every other year is only available after this date. Fortunately, the majority of the women gave birth to their second child before 1985, before the change in survey took place. Of those who gave birth to their second child after 1994, the data from the most recent year they gave birth was used.

Other missing data is a result of retention rates. While retention rates of the data are high at the beginning of the NLSY79, the retention rate for time period for this particular study is between 70 percent and 80 percent. Additionally, there may be a correlation between those who drop out of the NLSY79, that could affect results, such as if someone who moves a lot due to an unstable lifestyle (such as being evicted or moving in with family members) is unable to be contacted again, or if someone who works non-traditional hours is never available for an interview. If this were the case, then the sample would be disproportionally comprised of higher-earning mothers or mothers with more stable employment. To see if this is true, we could examine if there is a correlation between those who have dropped out (using past data) and their
employment status. If there is a strong correlation, those missing could be included using predicted values to balance out the number of observations.

Another weakness in the data is that the NLSY79 does not ask mothers about their children until 1986 even though many in this sample have had children by then. This means that health factors related to the children are only available after 1986. Maternity leave questions are also reserved for later years.

Lastly, the NLYS79 provides weekly employment information, but only the month and year a child was born. Since mothers are more likely to work three weeks before a pregnancy than three weeks after giving birth, we assumed that a mother gave birth in the last week of each month (Lauglin, 2011).
Results

Bivariate analyses

*Do the characteristics of mothers differ according to birth spacing?*

To examine whether mothers differ according to the spacing of their first and second births, I categorized them into three groups: second child was born within two years of first child, children were born between two and four years apart, first and second child were born more than four years apart. Table 2 provides means on each of the analysis variables across the three groups.

The time between births may contribute to marriage patterns. Nearly one third (32 percent) of mothers who gave birth more than four years apart had been previously married when they gave birth to their second child, compared to 20 percent of mothers who gave birth to children two to four years apart, and 13 percent of mothers who gave birth less than two years apart. This may also play a role in why births are spaced: women who were married when they gave birth to their second child may have delayed a second birth because they were ending the relationship with their previous partner.

As spacing between children increases, income earned in the previous year does as well. Mothers with the shortest birth-spacing interval earned on average $1,193 in the year before birth of their second child. Of those whose first and second children were born between two and four years apart, incomes were on average $2,014 in the year prior to the second birth. The average income is greatest for mothers whose birth spacing was more than four years -- $5,137. Similarly, 62 percent mothers with the widest birth spacing worked in the previous year.
compared to 58 percent of mothers in the two-to-four-year group, and 40 percent of mothers who gave birth to children less than two years apart.

Since this sample is limited to women who gave birth before the age of 22, the age at first birth is similar across all three birth spacing groups. The age that a woman gave birth to her second child increases as birth spacing increases, which is unsurprising because the greater the birth space between the first and second kid, the older the mother must be when giving birth to her second child, since there is little difference between the age mothers gave birth to their first child.

For women whose mothers worked at age 14, there is little difference between women who had less than two years in between their first and second child and two to four years between their first and second child, 49 percent and 48 percent, respectively. But mothers who gave birth to children more than four years apart are much more likely to have a mother who worked at age 14.

Women who gave birth to children in the smallest birth spacing cohort are also less likely to have lived with their mother at age 14, and the likelihood increases for each birth cohort. This is the opposite of women currently living with their mother: women with wider birth spaces are less likely to live with their mother when giving birth to their second child. This is likely because women who are in the smallest birth spacing cohort are younger, and may have never left home before having a second child.

Women who have children farther apart are also more highly educated. While 76 percent of women with the largest birth-spacing interval completed high school, the comparable figures
for women in the two-to-four year and less than two-year birth-spacing groups are 52 percent and 40 percent, respectively.

In terms of race and ethnicity, black women were most likely to give birth to children in the smallest birth-spacing interval, whereas Hispanic women and women who are neither black nor Hispanic are most likely to give birth to children farther apart.

Women who give birth to children more than four years apart are also more likely to live in an urban region, as 83 percent of women in the largest birth spacing cohort live in an urban region compared to 78 percent of women in the middle cohort and 75 percent of women in the smallest birth spacing cohort.

Do the characteristics of mothers differ according to the timing of their return to work?

The next question is whether there are discernable differences in the characteristics of young mothers according to workforce behavior following the birth of their second child. Table 3 categorizes the timing of joining/rejoining the labor market following the second birth into three groups: within six months, between six to 12 months, and after at least one year.

Twenty-nine percent of mothers who return or enter the workforce within six months are previously married, compared to 23 percent of women who return within six months and a year and 21 percent who return after a year. However, the rates of being in a relationship are similar regardless of when a mother returns to work.

Unsurprisingly, patterns of employment and income prior to the birth of the second child are related to the likelihood and timing of employment following the birth. Women who are employed within six months of the second child are the most likely to have been employed in the
prior year (88 percent) and have the highest average incomes ($6,128), compared to mothers who delayed entry/re-entry into the labor market. This suggests that these mothers are not only likely have a job to return to, they also face the highest opportunity costs for remaining outside of the workforce. Fifty-seven percent of mothers employed within six months to a year of the second birth were working for pay prior to the birth of the second child and earned an average of $2,282. In contrast, only 34 percent of mothers who were not employed for more than a year after their second child was born had jobs in the year prior to the birth, with an average income of $1,589. It is not possible to say whether the timing of post-birth employment reflects a deliberate decision or constrained opportunities.

In addition to having a job before birth of a second child, women who return or enter to the workforce within six months are much more likely to have health insurance through their employer. Eighty percent of women who enter the workforce within six months had health insurance from their previous employer, compared to 59 percent of women who returned between six months and a year and 29 percent of women who returned after a year.

A similar pattern emerges for education, as higher wages are often a result of higher education. Of women employed within six months, 78 percent had completed 12 years of high school, while just over half, 54 percent, of women who joined/rejoined the workforce between six and 12 months completed 12 years of high school, and 51 percent of women who did not return to work within a year giving birth. Rates of completing four years of college were less than 5 percent for all women.

Mothers who enter or return more quickly also receive fewer government benefits than other groups, one possible incentive to return to the workforce. Those who return after a year
receive on average $8,878 of AFDC funds, compared to those who are employed within six months, who received $3,051. Women who return between six and twelve months receive the most AFDC funds, $9,598. The percentage of women who gave birth to their second child before the effects of the 1996 PRWOR Act took place was similar regardless of when a mother returned to the workforce.

The age that a mother was when she gave birth to her first child was consistent, whether she returned within six months, after six months but before a year, or after a year. In contrast, the age that a woman was when giving birth to her second child is 24.15 years old on average of women who returned within six months, compared to 22.08 years old if returning within six months to a year, and 22.62 years old if returning after one year. This also means that the spacing between the birth of the first and second child is larger for women who returned the soonest: women who returned within six months had an average 5.94 years between births, while women who returned to work after six months but before a year had an average of 4.15 years between the births of their two children, and those who returned after a year have 4.48 years between the births of their two children.

Women who lived with their mother when giving birth to their second child are more likely to return to work within a year. Of those who returned within six months and six months and a year, 41 percent lived with their mother, compared to 32 percent of those who returned after a year. Since there is a clear distinction between the percentage of women who returned within a year and those who did not in terms of likelihood of living with a mother, it is possible that if I were to study beyond a year, women who returned shortly after a year may have similar
rates of living with a mother, compared to women who took significantly longer to return or enter the workforce.

Living with a mother at age 14 showed a similar pattern to those living with their mother when they gave birth to their second child. Sixty-six percent of women who lived with their mother at age 14 entered with workforce within six months, while 56 percent of women who returned between six months to a year and 55 percent of women who returned after a year lived with their mother at age 14. Women who returned the soonest were also most likely to have a mother who worked at age 14. Fifty-eight percent of women who worked within six months had a mother who worked when the woman sampled was 14, compared to 56 percent of women who returned between six months and a year, and 46 percent of women who returned after a year.

Of women who returned to work within six months, 65 percent were black, and of women who returned within six months to a year, 64 percent were black. Fifty-four percent of women who returned after a year were black. Hispanic women, in contrast, were less likely to return within a year. Ten percent of women who returned within a year were Hispanic, while 12 percent of mothers who returned within six months to a year were Hispanic, and 19 percent of women who returned after a year were Hispanic.

Those living in urban areas showed a slight difference between when they returned to work. Seventy-six percent of women who returned within six months lived in an urban region, compared to 83 percent of women who returned between six months and a year, and 82 percent who returned after a year.
**Multivariate results**

Until this point I have presented cross-tabulations of mothers’ characteristics according to different categories of birth spacing and timing of entry/re-entry into employment following the birth of the second child. A primary aim of this study, however, is to examine whether birth-spacing itself contributes not only to the probability that a mother will enter the labor market following the birth of a second child, but also when. To accomplish this, I use survival analysis.

The interval under investigation for the survival analysis is the year (52 weeks) after the second child is born. Of course, some mothers begin employment after the observation period, which is referred to a “right-censoring.” An important advantage of survival analysis over other methods (e.g., OLS regression), however, is that it incorporates information from both uncensored and censored cases in estimating model parameters. The survival function provides, for each of the 52 weeks being observed, the probability of “surviving” (remaining without a job) up to that time.

**What is the probability and timing of post-birth employment?**

For the sample of mothers as a whole, the overall survivor function (the probability that a woman will not be employed by week 52) is 51.9 percent. Conversely, slightly fewer than half of mothers began or returned to a job within a year of their second child’s birthday.

**Does the probability and timing of post-birth employment vary by birth-spacing?**

The next question is whether the survivor function differs according to the spacing between the first and second child. To address this, I divide the distribution of intervals between
first and second births into five quintiles: fewer than 20 months apart, between 21 and 35 months apart, between 36 and 53 months apart, between 54 and 77 months apart, and more than 78 months apart. As explained previously, because the division of birth spacing showed little effect on the overall results, categories were split evenly to include about 20 percent of the women in each.

Image 1 presents Kaplan-Meier curves (graphs of survival probabilities as a function of time) for mothers in each of the birth-spacing categories. Here we see that regardless of the relative timing of second births, the probability of remaining without a job declines over the 52-week observation period, which is not surprising since I am looking at when a mother enters the workforce for the first time. During each additional week, a mother who has become employed is no longer included in the sample, and thus cannot “return” to the workforce, since she has already returned.

Turning our attention to differentials by birth-spacing, we see that mothers with the most closely spaced births (fewer than 20 months apart) have the highest survival rate at 57 percent. It may be that these mothers face the greatest challenge in finding and/or affording childcare for two young children. Alternatively, they may have the most difficulty in locating compatible employment.

In contrast, women whose children are born more than six years apart are the most likely to return to work, with a survivor function of 45 percent. This could be due their first child being older, and thus needing less childcare than women with a younger first child. It could also be a result of being older, since the age that a woman gave birth to her first child is similar regardless
of birth spacing, and thus having a second child later also means a mother is older, and may have higher opportunity costs of staying out of the workforce.

Looking further, women whose children were born more than six years apart are also much more likely to work during pregnancy, as shown by the drop of those who did not enter the workforce in week one. As shown in the bivariate analysis, women who had children more than four years apart had higher rates of working for pay the year before giving birth, a strong indicator of returning to work. It may be that women whose first child is older, and thus has a larger space between children, is more easily able to hold a job than a woman with a younger child, and is more easily to work while pregnant than a woman with a young child already.

Despite its strengths in this context, one limitation of survival analysis is the inability to estimate parameters for non-time-varying covariates. Therefore, my next step is to estimate the effects of my explanatory variables on the probability of employment in the year following the second child’s birth.

*Using Cox proportional hazard regressions to compare birth spacing effects*

Thus far we have observed both a decreasing probability over time of remaining without a job regardless of birth spacing and that mothers with the most closely spaced births (fewer than 20 months apart) have the highest survival rate. However, because we also observed differentials in demographic characteristics, educational attainment, and work experiences between women with different birth spacing, the timing of return to work may be an artifact of these other life events or choices rather than a function of the gap between first and second births.
To account for this possibility, I used Cox proportional hazard regression to determine the hazard ratio of each birth spacing category, net of the influence of education, work experience and demographic characteristics. I estimate a series of models predicting the “risk” of returning to work within a year of the second birth, whereby I incrementally introduce controls that fall into three domains: education, access to work, and demographics. The first, or baseline model, includes four dummy variables for birth spacing. The second model adds dummy variables for years of completed education to the baseline model. Model 3 substitutes the education variables with several measures intended to capture “access to work,” including prior wages, holding a job before second birth, receipt of AFDC benefits, second birth occurred before 1997, and lived with her mother at the time the second child was born. These factors have been found to influence whether a mother works at all, regardless of birth timing. The fourth model accounts for demographic characteristics by adding to the baseline model measures of age, race, region, whether the respondent lived with her own mother at age 14 and whether her mother was employed, relationship status, and if previously married. The final model includes all the control variables. The results of all models can be found in Table 4.

**Effect of birth spacing on returning to work**

For Model 1, I again divided the distribution of birth spacing into quintiles and created dummy variables for each. The shortest interval, fewer than 20 months between first and second birth, was used as the benchmark. The results reveal that the mothers whose first and second births were spaced more than six years apart have a 60 percent chance of returning to work first compared to having a second child within 20 months of the first (hazard ratio: 1.55, p < .05).
None of the hazards ratios for the remaining birth spacing categories achieved statistical significance.

_Education and employment_

The next step is to see if the apparent effect of birth spacing can be attributable to other characteristics of mothers or intervening life events. In Model 2, after controlling for educational attainment, we can no longer detect a statistically significant difference according to birth spacing in the probability of returning to work. However, there is a very large educational attainment differential. A mother who has completed 12 years of high school has a probability of 67 percent of returning to work before a mother who has not completed high school (hazard ratio: 2.04, p < .01).

As previously mentioned, high wages and other employment-related benefits are positively correlated with returning to work after child birth. While education is tied to work, it is not a guarantee of a job, and so to further understand how work history relates to birth spacing and return to work, a mother’s previous income and amount of government benefits, as well as if she worked in the year before giving birth, if she lives with her mother, and if the child was born before 1996 were controlled for in Model 3. Of these, being employed the prior year had the strongest impact on the likelihood a mother returned to work. Mothers who worked in the previous year have a 75 percent probability of returning to work or entering the workforce before those who did not work in the previous year (hazard ratio: 3.08, p < 0.01). Additionally, according to this same model, a mother who lives with her mother has a 64 percent probability of returning to work earlier than a woman who does not (hazard ratio: 1.74, p < 0.05). This is
unsurprising, as past research has found that the death of a maternal grandmother is associated with lower employment rates of the mothers of their grandchildren. Neither wages nor AFDC benefits, or giving birth before 1996 showed statistically significant effects.

Because birth spacing effects disappeared when education and work histories were included in the model, it is likely that these factors -- whether a mother completed high school or worked previously -- are more common as women wait longer to give birth to their second child, as more time has allowed for a mother to finish high school or stay in a particular job.

**Demographic effects on returning to work**

To further understand whether and how birth spacing plays a role in returning to work, demographic variables, such as race and age, if a mother was previously married and if she lives in a rural or urban area were included along with birth spacing effect. Unsurprisingly, of these characteristics, the age of a mother has a strong impact on returning to work: each additional year older a woman is when she gives birth to her second child is associated with a 6 percent increase in risk of returning to work, keeping age, characteristics of the respondent’s mother, age and if a respondent was in a relationship or previously married constant (hazard ratio: 1.06, p < 0.05).

Unexpectedly, the results reveal that women whose mother worked at age 14 and who lived with their mother at age 14 have a greater chance of returning to work first compared to those who did not live with a mother or whose mother did not work. Race also plays a role: while controlling for demographics and birth spacing, black women have a 58 percent probability of
returning to work before non-black women after the birth of their second child (hazard ratio: 1.38, p < 0.1).

As described in Table 1, both black women, women who lived with their mother at age 14 and women who had a mother who worked at age 14 are more likely to have children more than four years apart compared to mothers who gave birth less than two years apart or two to four years apart, possibly explaining why birth spacing effects are no longer significant. While more research may be needed to understand the correlations between race or living with a mother at age 14 and having children more than four years apart, this model suggests that while there are overlaps between birth spacing and demographics, returning to work is more closely tied to demographics, not necessarily birth spacing.

**Combining demographic, education and work history**

By controlling for all previously included variables, we can see more closely both what predicts returning to work and whether birth spacing is relevant. In Model 5, it is clear that being employed the year before is the strongest predictor of returning to work. Holding all other factors constant, women who were employed the year before birth have a 73 percent probability of returning to work than those who did not work the year previous to the birth of their second child (hazard ratio: 2.69, p < .01). Having a child before the effects of the 1996 law also was found to be both statistically significant and a deterrent for returning to work, as women who gave birth to their second child before the 1996 took effect have a nearly 100 percent probability of returning to work before mothers who gave birth after the law took effect, holding all other variables constant (hazard ratio: 0.02, p < .05).
As found with the previous models, while birth spacing, especially having children farther apart, shows a strong correlation to returning to work earlier compared to having children closer together, these trends disappear when other factors that affect returning to work are included. However, it remains that birth spacing has patterns demographics, as women who give birth to children farther apart have higher wages and more education, suggesting that there are factors tied to both birth spacing and employment.
Conclusion

The results of this study revealed that women who give birth to children far apart – more than six years – have a greater risk of returning to work or entering the workforce within a year than women who space their children’s births more closely together. But, once other factors were included, such as working the year before and previous wages, these effects disappear.

This suggests that the birth spacing of the first two children is likely an artifact of other life circumstances, as opposed to a strategy for facilitating a prompt return to work after the second birth. Having children farther apart signifies that a woman is older, and likely has higher wages and more work experiences, both strong indicators of returning to work. Additionally, women who were previously married have children farther apart. This could be because they have broken up with their partner since the birth of their first child. Moreover, previously married women may have a stronger support system in their former partner than never-married women.

While this study finds that net of controls, birth spacing has little, if any, effect on returning to work within the first year, it does illustrate the importance of previous employment. We know from previous studies that single mothers are less likely than married mothers to work while pregnant. The same pattern holds for younger and less well-educated mothers, compared to their older, better educated counterparts. These facts, taken with my findings mean that single mothers, who are most economically vulnerable if unemployed, also have the lowest likelihood of employment in the year following the birth of their second child.

One possible way to help single mothers return to work more quickly is to ensure that they can maintain their jobs while pregnant. Low-wage mothers are more likely than high-wage
mothers to work in service industry jobs, such as food service or cleaning (Lee, 2004). These jobs may be too physically demanding to the point that a worker is unable to fulfill her duties while pregnant. Potential policy solutions are to ensure reasonable accommodations for women working while pregnant without fearing they will lose their job. Alternatively, ensuring that there are jobs that are not physically demanding that are available to workers with low education levels may help single mothers.

Another option to help single mothers return to work is to ensure that single mothers can take time off from their job instead of quitting. A 2006 - 2008 U.S. Census Bureau survey found that of all mothers, paid leave was the most common form of leave when pregnant. Since single mothers are disproportionally in low-wage jobs, they are also less likely to be in positions that offers paid leave (Laughlin, 2011). However, since 2006, paid family leave has gained traction, and currently five states and Washington, D.C. offer some type of paid family leave to employees (“State Paid Family and Medical Leave Laws,” 2018).

Lastly, single mothers who live with their mothers were found to return to the workforce sooner. For those that cannot rely on parental support, child care assistance, most of which is through the Child Care and Development Block Grant (CCBDG), can allow single mothers to return to work after giving birth by giving them financial support for child care.

One of the biggest weaknesses of the present study is that nearly all the women gave birth to their second child before 1997, pre-dating the effects of the PRWORA. While I found that receiving AFDC decreased the chances that a single mother may return to work after giving birth, this may have changed since 1997, when work requirements were added to the eligibility criteria of many government benefits. Studies using more contemporary data can shed light on
the influence of welfare reform in shaping women’s employment decisions following the birth of a second child.

Additionally, since I limited my sample to young mothers, many questions related to children that were not asked until later years of the NLSY79 were unavailable to me. Questions regarding the health of the children and maternity leave options would have allowed me to better understand if what impacts when a mother returns to work. Of the women sampled, more than half did not work for pay in the year after giving birth. To more fully understand the effects of birth spacing on employment patterns, further research should include time periods longer than a year to see when or if most women begin working birth. Finally, while these findings illuminate when a woman returns to work, it does not determine how long she stays in this job. More research should be done on the duration, in addition, to the timing of returning to work after birth to a second child.
Appendix: Tables and Figures

Table 1: Descriptive statistics of single mothers of two children who gave birth to their first child before age 22
  n = 543

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Previously married</td>
<td>0.24</td>
<td>0.43</td>
</tr>
<tr>
<td>In a relationship</td>
<td>0.2</td>
<td>0.42</td>
</tr>
<tr>
<td>Income in previous year</td>
<td>3,325.59</td>
<td>5,354.08</td>
</tr>
<tr>
<td>Employed in the previous year</td>
<td>0.56</td>
<td>0.5</td>
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<tr>
<td>Health insurance provided by employer in previous year</td>
<td>0.51</td>
<td>0.5</td>
</tr>
<tr>
<td>Gave birth to second child before 1997</td>
<td>0.99</td>
<td>0.12</td>
</tr>
<tr>
<td>Age at first birth</td>
<td>18.14</td>
<td>1.96</td>
</tr>
<tr>
<td>Age at second birth</td>
<td>23.11</td>
<td>4.12</td>
</tr>
<tr>
<td>Live with mother</td>
<td>0.36</td>
<td>0.48</td>
</tr>
<tr>
<td>Live with mother at age 14</td>
<td>0.59</td>
<td>0.49</td>
</tr>
<tr>
<td>Mother worked at age 14</td>
<td>0.52</td>
<td>0.5</td>
</tr>
<tr>
<td>Amount of AFDC received in year previous to birth</td>
<td>6,823.69</td>
<td>11,894.22</td>
</tr>
<tr>
<td>Completed 12 years of high school</td>
<td>0.61</td>
<td>0.49</td>
</tr>
<tr>
<td>Completed 4 years of college</td>
<td>0.02</td>
<td>0.12</td>
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<tr>
<td>Black</td>
<td>0.59</td>
<td>0.49</td>
</tr>
<tr>
<td>Hispanic</td>
<td>0.15</td>
<td>0.36</td>
</tr>
<tr>
<td>Non-black, non-Hispanic</td>
<td>0.26</td>
<td>0.44</td>
</tr>
<tr>
<td>Years in between births of two children</td>
<td>4.97</td>
<td>3.86</td>
</tr>
<tr>
<td>Live in an urban region</td>
<td>0.8</td>
<td>0.4</td>
</tr>
</tbody>
</table>

AFDC = Aid to Families with Dependent Children
Table 2: Descriptive statistics of single mothers of two children who gave birth to their first child before age 22, by birth spacing

<table>
<thead>
<tr>
<th>Variable</th>
<th>Less than 2 years</th>
<th>2 to 4 years</th>
<th>More than 4 years</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
</tr>
<tr>
<td>Previously married</td>
<td>0.13</td>
<td>0.33</td>
<td>0.2</td>
</tr>
<tr>
<td>In a relationship</td>
<td>0.16</td>
<td>0.37</td>
<td>0.19</td>
</tr>
<tr>
<td>Income in previous year</td>
<td>1,193.11</td>
<td>2,667.97</td>
<td>2,014.01</td>
</tr>
<tr>
<td>Employed in the previous year</td>
<td>0.4</td>
<td>0.49</td>
<td>0.58</td>
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<tr>
<td>Health insurance provided by prev. employer</td>
<td>0.4</td>
<td>0.49</td>
<td>0.57</td>
</tr>
<tr>
<td>Gave birth to second child before 1997</td>
<td>1</td>
<td>0.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Age at first birth</td>
<td>18.3</td>
<td>1.9</td>
<td>18.29</td>
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<tr>
<td>Age at second birth</td>
<td>19.75</td>
<td>1.9</td>
<td>21.23</td>
</tr>
<tr>
<td>Live with mother</td>
<td>0.5</td>
<td>0.5</td>
<td>0.38</td>
</tr>
<tr>
<td>Live with mother at age 14</td>
<td>0.53</td>
<td>0.5</td>
<td>0.57</td>
</tr>
<tr>
<td>Mother worked at age 14</td>
<td>0.49</td>
<td>0.5</td>
<td>0.48</td>
</tr>
<tr>
<td>Amount of AFDC received in prev. year</td>
<td>6,929.58</td>
<td>12,192.36</td>
<td>6,973.18</td>
</tr>
<tr>
<td>Completed 12 years of high school</td>
<td>0.4</td>
<td>0.49</td>
<td>0.52</td>
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<tr>
<td>Completed 4 years of college</td>
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<td>0</td>
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<td>0.5</td>
<td>0.57</td>
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<tr>
<td>Hispanic</td>
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<td>0.14</td>
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<tr>
<td>Non-black, non-Hispanic</td>
<td>0.29</td>
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<td>0.3</td>
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<tr>
<td>Years in between births</td>
<td>1.42</td>
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<td>2.94</td>
</tr>
<tr>
<td>Urban region</td>
<td>0.75</td>
<td>0.44</td>
<td>0.78</td>
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</table>

AFDC = Aid to Families with Dependent Children
### Table 3: Descriptive statistics of single mothers of two children who gave birth to their first child before age 22, by amount of time until returning to work

<table>
<thead>
<tr>
<th>Variable</th>
<th>Less than 6 months n = 199</th>
<th>6 to 12 months n = 58</th>
<th>More than 12 months n = 283</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
</tr>
<tr>
<td>Previously married</td>
<td>0.29 (0.45)</td>
<td>0.23 (0.42)</td>
<td>0.21 (0.41)</td>
</tr>
<tr>
<td>In a relationship</td>
<td>0.2 (0.44)</td>
<td>0.23 (0.42)</td>
<td>0.19 (0.4)</td>
</tr>
<tr>
<td>Income in previous year</td>
<td>6,127.78 (6,815.5)</td>
<td>2,282.43 (3,738.16)</td>
<td>1,589 (3,244.48)</td>
</tr>
<tr>
<td>Employed in the previous year</td>
<td>0.88 (0.32)</td>
<td>0.57 (0.49)</td>
<td>0.34 (0.47)</td>
</tr>
<tr>
<td>Health insurance provided by prev. employer</td>
<td>0.8 (0.4)</td>
<td>0.59 (0.49)</td>
<td>0.29 (0.45)</td>
</tr>
<tr>
<td>Gave birth to second child before 1997</td>
<td>0.97 (0.17)</td>
<td>0.98 (0.13)</td>
<td>0.97 (0.06)</td>
</tr>
<tr>
<td>Age at first birth</td>
<td>18.2 (2)</td>
<td>17.93 (1.97)</td>
<td>18.14 (1.91)</td>
</tr>
<tr>
<td>Age at second birth</td>
<td>24.15 (4.8)</td>
<td>22.08 (1.97)</td>
<td>22.62 (3.5)</td>
</tr>
<tr>
<td>Live with mother</td>
<td>0.41 (0.49)</td>
<td>0.41 (0.49)</td>
<td>0.32 (0.47)</td>
</tr>
<tr>
<td>Live with mother at age 14</td>
<td>0.66 (0.47)</td>
<td>0.56 (0.5)</td>
<td>0.55 (0.5)</td>
</tr>
<tr>
<td>Mother worked at age 14</td>
<td>0.58 (0.49)</td>
<td>0.56 (0.5)</td>
<td>0.46 (0.5)</td>
</tr>
<tr>
<td>Amount of AFDC received in prev. year</td>
<td>3,051.30 (9,428.42)</td>
<td>9,597.92 (16,723.12)</td>
<td>8,878.14 (11,517.87)</td>
</tr>
<tr>
<td>Completed 12 years of high school</td>
<td>0.78 (0.42)</td>
<td>0.54 (0.5)</td>
<td>0.51 (0.5)</td>
</tr>
<tr>
<td>Completed 4 years of college</td>
<td>0.03 (0.16)</td>
<td>0.0 (0)</td>
<td>0.01 (0.1)</td>
</tr>
<tr>
<td>Black</td>
<td>0.65 (0.48)</td>
<td>0.64 (0.48)</td>
<td>0.54 (0.5)</td>
</tr>
<tr>
<td>Hispanic</td>
<td>0.1 (0.29)</td>
<td>0.12 (0.32)</td>
<td>0.19 (0.4)</td>
</tr>
<tr>
<td>Non-black, non-Hispanic</td>
<td>0.26 (0.44)</td>
<td>0.25 (0.43)</td>
<td>0.27 (0.44)</td>
</tr>
<tr>
<td>Years in between births of two children</td>
<td>5.94 (4.83)</td>
<td>4.15 (3.06)</td>
<td>4.48 (3.03)</td>
</tr>
<tr>
<td>Urban region</td>
<td>0.76 (0.43)</td>
<td>0.83 (0.38)</td>
<td>0.82 (0.38)</td>
</tr>
</tbody>
</table>

AFDC = Aid to Families with Dependent Children
<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1 DV: Birth spacing</th>
<th>Model 2 DV: Education</th>
<th>Model 3 DV: Access to work</th>
<th>Model 4 DV: Demographics</th>
<th>Model 5 DV: All controls</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between 21 and 35 months apart</td>
<td>1.08 (0.24)</td>
<td>1.01 (0.22)</td>
<td>0.69 (0.26)</td>
<td>0.98 (0.22)</td>
<td>0.99 (0.57)</td>
</tr>
<tr>
<td>Between 36 and 53 months apart</td>
<td>1.23 (0.25)</td>
<td>1.09 (0.23)</td>
<td>0.75 (0.26)</td>
<td>1.01 (0.22)</td>
<td>0.76 (0.35)</td>
</tr>
<tr>
<td>Between 54 and 77 months apart</td>
<td>1.16 (0.24)</td>
<td>0.91 (0.19)</td>
<td>1.11 (0.38)</td>
<td>0.81 (0.18)</td>
<td>1.29 (0.63)</td>
</tr>
<tr>
<td>More than 77 months apart</td>
<td>1.55 (0.30) *</td>
<td>1.17 (0.24)</td>
<td>0.78 (0.29)</td>
<td>0.80 (0.22)</td>
<td>0.95 (0.57)</td>
</tr>
<tr>
<td>Completed 12 years of high school</td>
<td></td>
<td>2.04 (0.29) ***</td>
<td></td>
<td>1.11 (0.35)</td>
<td></td>
</tr>
<tr>
<td>Completed 4 years of college</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.38 (0.63)</td>
</tr>
<tr>
<td>Lives with their mother</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.24 (0.39)</td>
</tr>
<tr>
<td>% increase in wages</td>
<td></td>
<td>1.17 (0.13)</td>
<td></td>
<td>1.18 (0.15)</td>
<td></td>
</tr>
<tr>
<td>% increase in AFDC</td>
<td></td>
<td>0.98 (0.09)</td>
<td></td>
<td>0.98 (0.11)</td>
<td></td>
</tr>
<tr>
<td>Employed in previous year</td>
<td></td>
<td>3.08 (0.88) ***</td>
<td></td>
<td>2.69 (0.89) **</td>
<td></td>
</tr>
<tr>
<td>Gave birth to second child before 1997</td>
<td></td>
<td>0.45 (0.47)</td>
<td></td>
<td>0.01 (0.02) **</td>
<td></td>
</tr>
<tr>
<td>Lived with mother at age 14</td>
<td></td>
<td></td>
<td></td>
<td>1.33 (0.12) *</td>
<td>1.37 (0.41)</td>
</tr>
<tr>
<td>Live in an urban area</td>
<td></td>
<td></td>
<td></td>
<td>0.80 (0.02)</td>
<td>0.53 (0.18) †</td>
</tr>
<tr>
<td>Age at second birth</td>
<td></td>
<td></td>
<td></td>
<td>1.07 (0.18) **</td>
<td>0.89 (0.07)</td>
</tr>
<tr>
<td>Black</td>
<td></td>
<td></td>
<td></td>
<td>1.38 (0.23) †</td>
<td>1.05 (0.33)</td>
</tr>
<tr>
<td>Hispanic</td>
<td></td>
<td></td>
<td></td>
<td>0.71 (0.17)</td>
<td>0.50 (0.30)</td>
</tr>
<tr>
<td>In a relationship</td>
<td></td>
<td></td>
<td></td>
<td>1.06 (0.16)</td>
<td>0.96 (0.37)</td>
</tr>
<tr>
<td>Previously married</td>
<td></td>
<td></td>
<td></td>
<td>1.20 (0.19)</td>
<td>1.05 (0.37)</td>
</tr>
<tr>
<td>% Censored</td>
<td></td>
<td></td>
<td></td>
<td>51.57%</td>
<td>51.57%</td>
</tr>
<tr>
<td>Log-likelihood</td>
<td></td>
<td></td>
<td></td>
<td>57.72%</td>
<td>51.57%</td>
</tr>
<tr>
<td>$x^2$</td>
<td></td>
<td></td>
<td></td>
<td>57.72%</td>
<td>57.72%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Statistical significance:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>† $p &lt; .1$ * $p &lt; .05$, ** $p &lt; .01$, *** $p &lt; .001$</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

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Image 1: Kaplan-Meier survival function of women who had not entered the workforce after the birth of their second child
Bibliography


Job Retention and Mobility among Low-Income Mothers. *Institute for Women’s Policy
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