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The Effects of Childbearing Patterns on the Timing of Retirement

Hsiao-Yin Chung
University of Massachusetts Boston

THE EFFECTS OF CHILDBEARING PATTERNS ON THE TIMING OF

RETIREMENT

A Dissertation Presented

by

HSIAO-YIN CHUNG

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ABSTRACT

THE EFFECTS OF CHILDBEARING PATTERNS ON THE TIMING OF

RETIREMENT

December 2010

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The effects of childbearing patterns on the timing of men's and women's

retirement were examined. The data for this study come from the Health and Retirement

Study, waves 1–7: 1992, 1994, 1996, 1998, 2000, 2002, and 2004. A proportional hazard

model (Cox regression) was chosen for this study. Two measures of retirement were

considered: labor force exit and self-defined retirement. The results indicated that men

with dependent children are more likely to postpone the timing of labor force exit and

their self-definition as retired. At the same time, the study indicated that the presence (or

absence) and timing of early childbearing experience has a long-term effect on the timing

of retirement in later life. In particular, for both men and women, childbearing factors

associated with a greater family burden in early life (e.g., parenthood and early

childbearing) are related to a later labor force exit. The number of children, however, only affects the timing of women's labor force exit.

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INTRODUCTION

Research Background

The demographic trend of population aging raises concerns about labor shortage,

which in turn has an effect on a nation's GDP, the financial stability of its pay-as-you-go

social insurance system, and the size and composition of its federal budget (Purcell,

2005). According to the Census Bureau, the proportion of older people in the U.S. is

increasing. People aged 65 and over are projected to account for 19.6 % of the total

population in 2030 (U.S. Census Bureau, 2003). An increasing concern for the solvency

of the Social Security program has led to public efforts to retain older workers. Under the

same dependency ratio, delayed retirement could increase the size of the labor force and

thus reduce the financial burden on the Social Security system. Consequently,

understanding factors that predict the timing of retirement can have important public

policy implications.

At the same time, while the American population as a whole is growing older,

another demographic trend is also emerging. For many Americans, childbearing

experiences have begun to diverge from established patterns. Increasingly, women have

delayed the timing of their childbearing years due to education, late marriage, or career

development. From 1990 to 2006 the birthrate (women who had a birth in the last 12 months per 1000 women) among women aged 15–19 decreased from 59.9 ‰ in 1990 to 26.4 ‰ in 2006. The birthrate among women aged 20–24 decreased from 116.5 ‰ in 1990 to 92.3 ‰ in 2006. The birthrate among women aged 25–29 decreased from 120.2 ‰ in 1990 to 117.6 ‰ in 2006. A reversed trend is seen among women over age 30. The birthrate among women aged 30–34 increased from 80.8 ‰ in 1990 to 102 ‰ in 2006; during the same period, among women aged 35–39, the rate increased from 31.7 ‰ to 55.8 ‰, and among women aged 40–44 years, the rate increased from 5.5 ‰ to 15.0 ‰ (Dye, 2008; Sutton, 2004). A national vital statistics report (2002) published by the National Center for Health Statistics also confirms this trend. The report indicates that the average age of women having their first child increased from 21.4 in 1970 to 24.9 in 2000. Due to the delay in the timing of the first childbirth, the timing of subsequent childbirths was also delayed. The average age of women having their second child increased from 24.1 years in 1970 to 27.7 years in 2000; their age at their third childbirth increased from 26.6 years in 1970 to 29.2 years in 2000; and their age at their fourth childbirth increased from 28.7 years in 1970 to 30.3 years in 2000 (Mathew, 2002). Because women usually marry men who are older than they are, men usually experience fatherhood later than women do.

However, this trend of delayed childbearing is not equally common among all subgroups of women. Instead, delayed childbearing is more prominent among more advantaged women, such as women who are white, who have graduated from college, who earn a high income, or who hold a higher occupational status. In the late 1970s,

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women over the age of 30 had low fertility rates regardless of their race or educational level. By the early 1990s, a trend toward delayed childbearing could be seen among women with college degrees (Martin, 2000). Using data from the 1980, 1985, 1990, and 1995 Current Population Survey and from the 1988 and 1995 National Survey of Family Growth (NSFG) surveys, Yang and Morgan (2003) found that compared to less-educated women and African Americans, college-educated women and whites experienced substantial increases in age at first childbirth (Yang & Morgan, 2003). Other studies also found that women who delay childbearing are more likely to have a higher income, a higher occupational status (Blackburn, 1993; Rindfuss, 1980), and a more stable marriage (Bloom, 1984).

Furthermore, women are not only delaying childbearing but are having fewer children overall. The number of women who remain childless has increased sharply over the past two decades. According to the U.S. Census Bureau, among women aged 40–44 the percentage of women who have never had a child increased from 10% in 1976 to approximately 20% in 2006. At the same time, among women aged 40–44 the average number of children decreased from 3.1 in 1976 to 1.9 in 2006. The percentage of women aged 40–44 who have three or more children decreased from 59% in 1976 to 28% in 2006 (Dye, 2008).

The childbearing patterns of many Americans have changed considerably in recent decades. Determining the impact of childbearing patterns on the timing of retirement in later life could help predict the future participation of older workers in the labor force. This study will examine the effect of the timing and pattern of childbearing

on retirement age and infer how changes in childbearing patterns will affect retirement trends in the future.

Literature Review

Predictors of the Timing of Retirement

As the current labor force ages, researchers have devoted much energy to studying retirement transitions. Previous attempts to explore factors related to the timing of retirement can be categorized according to the type of methodological approach they used: macro approaches, meso approaches, and micro approaches (Szinovacz, 2003). The macro and micro approaches are commonly used to examine the predictors of retirement transitions. The macro approach explains the variations in retirement transitions over time and across cultures. The micro approach explains the variations among individuals in retirement transitions. In recent years, some studies have started to apply a meso approach—namely, the organizational research approach—and have emphasized the effects that organizational factors, such as the characteristic features of a business firm or a union, have on people's retirement decisions.

Macro Approach

Many previous studies of retirement transitions have taken a macro-level approach to the problem. The macro approach proposes that an individual's behavior is shaped not only by factors specific to that individual but also by society at large. Some studies have examined how the change in macro factors such as population structure, Social Security rules, anti–age discrimination legislation, and economic situation

contribute to the trend of retirement transitions over time (Burkhauser & Quinn 1997;

Gillemard, 1982; Gruber & Wise, 1999; Mermin, 2007; Quandagno, 1997; Szinovacz,

2003). Other studies have explored how differences in demography, legislation, and other

macro factors across cultures and societies contribute to the international variation in

retirement transitions (Adams, 2004; Burkhauser & Quinn, 1997; Han & Moen, 1999;

Neumark & Stock, 1999).

Demographic trends are seen as important macro factors that contribute to

retirement patterns. Increasing longevity and declining fertility rates determine the

relative size of the working-age population. It is easier for a society to finance a small

retiring cohort rather than a large retiring cohort. Therefore, when a large cohort followed

by a small cohort, such as the baby boomers, is retiring, public policies and social norms

are more likely to encourage delayed retirement in order to relieve the financial burden

on the younger population and reduce the pressure of labor shortage. Also, increases in

life expectancy and improvements in health care give people the motivation and ability to

prolong their working life so that they can accumulate more financial resources for

retirement (Han & Moen, 1999).

Previous studies have indicated the impact that changes in law can have on

retirement transitions. In the 1920s, many firms began to impose restrictions on hiring

people older than the age of 45 or 50 (Costa, 1998). In the 1960s, concerns about a trend

in the labor force toward early retirement as well as concerns about Social Security

solvency facilitated the passage of anti–age discrimination legislation. The Age

Discrimination in Employment Act (ADEA) of 1967 prohibits age discrimination and

eliminates mandatory retirement rules for workers in most sectors and positions. The passage of anti–age discrimination legislation and the outlawing of mandatory retirement ages in most sectors are expected to encourage late retirement (Adams, 2004; Burkhauser & Quinn, 1997; Neumark & Stock, 1999). Adams (2004) used the Current Population Survey sample to estimate the effect that age discrimination legislation has had on the labor force. The research results indicated an increase in employment and a decrease in retirement. In 1978, Congress outlawed mandatory retirement before age 70, and mandatory retirement was abolished in 1986. Studies that assess the effects of restricting mandatory retirement show positive but small effects on the delaying of retirement (Burkhauser & Quinn, 1983).

The research literature shows that from 1964 through the mid-1980s, the expansion of Social Security and pension coverage has decreased the opportunity cost of giving up a paying job and thus accounts for a decline in the average retirement age, as well as in the participation of older people in the labor force (Anderson, 1999; Mermin, 2007; Quandagno, 1997). After that period, many changes in Social Security retirement benefit rules resulted in a reversal of the early retirement trend. In 1988 and 1989, the adoption of a less strict Social Security earning test and an increase in delayed retirement credit made Social Security age-neutral and provided a monetary incentive for workers to extend their working life (Anderson, 1999; Burkhauser & Quinn, 1997; Gustman & Steinmeier, 1991). Also, the extension of the normal retirement age to 67 for anyone born after 1960, which is a result of legislation passed in 1983, is expected to further contribute to the trend of delayed retirement (Gustman & Steinmeier, 1991; Quinn, 1997).

An international comparative study that explored the effects of retirement benefits on retirement transitions confirmed the results of longitudinal studies showing that a generous social security system induces early retirement (Gruber & Wise, 1999; Guillemard, 1982).

In addition to changes in Social Security, many studies have explored the effect of changes in pensions on retirement transitions. Defined-benefit retirement plans that provide an annuity to older workers give them a strong financial incentive to retire early, because they forgo the benefit after they pass normal retirement age. On the other hand, workers with a defined-contribution plan may still accumulate pension if they keep working past the normal retirement age. Between 1992 and 2004, the percentage of workers aged 51–61 who were covered by employer-provided pensions declined from 42% to 39%. The percentage of workers who were covered by defined-benefit pension plans decreased from 40% to 31%. At the same time, the percentage of workers who were covered by defined-contribution plans increased from 34% to 46% (Mermin, 2007). The pension law of 1989, which requires that every year of service after the age of 65 be taken into account when calculating pension benefits, also eliminates any financial penalty on delayed retirement. These studies indicate that current declines in the rate of pension coverage, shifts from defined-benefit pension plans to defined-contribution plans, and the 1989 changes to pension rules have contributed to the recent trend of delayed retirement among baby boomers (Anderson, 1999; Han & Moen, 1999; Mermin, Johnson & Murphy, 2007; Zissimopoulos & Karoly, 2007).

Another factor bearing on retirement age that has been frequently mentioned by previous studies is health insurance coverage for retirees. Due to high medical costs in the U.S., the incentive of keeping health insurance coverage may motivate older workers to stay on the job longer. Previous studies indicated that the expansion of health insurance for retirees also contributed to a decline in the participation of older people in the labor force from 1964 to the mid-1980s (Mermin, 2007; Quandagno, 1997). Afterward, the decline of health insurance coverage for retirees contributed to a reversed trend. While the percentage of older workers aged 51–61 who are covered by employer-provided health insurance remained constant, the percentage of employers who would provide health insurance coverage after older workers retired dropped from 56% in 1992 to 39% in 2004. This decrease could partially account for the trend toward delayed retirement among baby boomers (Mermin, Johnson & Murphy, 2007)

The price of recreation goods also affects the timing of retirement. The cost of consuming leisure time is affected by the price of recreation goods. Therefore, a decrease in the cost of recreation goods motivates an increase in leisure time consumption and promotes the trend of early retirement (González-Chapela, 2007). According to a previous study conducted by Owen (1971), the drop in the relative price of recreation goods from 1900 to 1950 had a negative impact on the average number of work hours (Owen, 1971). A later study found that from 1976 to 1981, a decline in the relative price of recreation goods corresponded to a decline in the average number of hours people spent on paid work, while from 1981 to 1992 an increase in the relative price of recreation goods corresponded to an increase in the average number of hours people

spent on paid work (González-Chapela, 2007). An international comparative study of

trends in the relative price of recreation goods in Germany, France, and the U.S. led to

the same conclusion. The relative price of recreation goods from 1981 to 1992 increased

in the U.S., while the relative price of recreation goods in Germany and France declined.

At the same time, the average number of work hours per working person increased in the

U.S., while the average number of work hours per working person declined in Germany

and France (González-Chapela, 2007). All of these studies consistently found that a

relatively low cost of recreation goods induces early retirement.

Economic transitions and changes in industrial structure also impact the

participation of the elderly in the labor force. Parsons (1996) proposed that the economic

transformation since 1950 includes an overall decline in U.S. manufacturing employment,

and a corresponding rise in the service sector. Given that the service sector provides older

workers with more flexibility and more opportunities to extend their working life

(Parsons, 1996), and is less likely to provide pension coverage compared to the

manufacturing sector (Parsons, 1996), the growing dominance of the service sector

encourages people to work longer in order to establish financial security.

Studies examining the effects of economic shock on the labor market for older

workers have reached divergent conclusions. Wachter's study explored the period of

economic decline from the 1970s to the mid-1980s and concluded that economic shocks

have negative effects on the employment of older workers, even though the negative

impacts may be unevenly distributed in the labor force. For example, the decline in the

labor force participation rate for low-skilled workers is more dramatic, and the variations

across sectors are significant (Anderson, 1999; Han & Moen, 1999; Wachter, 2007). However, when other conditions change, economic shocks may interact with other factors to produce very different results. For example, under a defined-contribution retirement plan, employees instead of employers have to bear the risk of investment. Thus, during an economic shock, workers with a defined-benefit plan are more likely to withdraw from the labor market, while retirees with a defined-contribution plan are more likely to remain in the labor force in order to make up for the loss (Eschtruth, 2002). Eschtruth (2002) determined that the bearish stock market since early 2000, combined with a rise in defined-contribution plans, accounts for the increase in the labor force participation rate of older workers.

Social norms and cultural factors also contribute to retirement decisions. Williamson and Higo (2007) indicated that in comparison to the U.S., Japanese culture highly values continued productivity and thus encourages workers to pursue a longer working life (Williamson & Higo, 2007). On the other hand, in other Asian countries where filial responsibility is highly valued, such as Hong Kong, older parents may be discouraged from working because a parent's employment can be interpreted as a sign that the children have failed to support their parent (Ngan, Chiu, & Wong, 1999).

An international comparative study of European countries indicated that from 1970 to 2003, the employment rates of older individuals (55–64) rose or remained stable in most Anglo-Saxon and Nordic countries, where the negative attitude toward older workers (measured by responses to the question, "When jobs are scarce, should older people retire early?") is diminishing. On the other hand, the employment rates of older

individuals significantly declined in Continental and Mediterranean countries, where negative attitudes toward older workers have remained strong (Algan & Cahuc, 2005).

Social norms apply not only to the behavior of individual workers but also to the behavior of firms. In Japanese culture, the media and public opinion are attentive to the social responsibility of large firms. The media criticize large companies that only issue severance pay to long-standing employees, without helping them to find new jobs; consequently, those companies may have a hard time attracting high-quality employees. Thus, under such social pressures and expectations, it is not uncommon for large Japanese companies to retrain older workers and arrange for new employment for them after separation (Usui, 1998).

Social infrastructure can also affect the retirement decisions of older workers. When a firm closes, for example, the presence or absence of local resources for job retraining or job referral for displaced older workers can have a strong influence on their motivation and their ability to find a new job (Szinovacz, 2003).

The behavior of individuals is shaped by the society they belong to. The effects of macro factors on the timing of retirement indicate that government can respond to changes in retirement patterns and influence the timing of retirement through public policies.

Meso Approach (Organizational Research)

The second approach mentioned by Szinovacz (2003) is the meso-level approach. Unlike the macro-level approach, which examines the effect of larger social structures on individual behavior, the meso-level approach examines how smaller social structures or

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organizations affect individual behavior. The meso approach focuses on organizations

such as individual companies or firms, or the social infrastructure of a community. It

examines how the specific organizational characteristics of a particular firm affect

individual behavior.

Previous studies have shown that meso-level factors, such as the size of a firm or

whether it is unionized, can impact older workers' retirement decisions. Given the high

administration costs of pension plans, large companies are more likely to provide

pensions, and also more likely to provide defined-benefit plans (Kruse, 2008; Parsons,

1996). Also, because unions give laborers the power of collective bargaining, unionized

companies are more likely to provide pension coverage (Freedman, 1985). Given that

pension coverage, especially defined-benefit pension coverage, induces early retirement,

workers in a large and unionized firm are more likely to opt for early retirement (Mermin,

Johnson & Murphy, 2007).

Another meso-level factor that affects retirement decisions is whether a firm

offers an age-friendly working environment. Previous studies have shown that workers in

large firms and workers in unionized companies are more likely to perceive the existence

of age norms. Also, those workers are more likely to think that it is appropriate to retire at

a younger age, and also more likely to expect to retire at a younger age. Furthermore,

workers who have an employer- or union-provided pension plan are more likely to

perceive the existence of a standard age of retirement, compared to workers who do not

have pension coverage (Ekerdt, 1998). Early-retirement incentive programs can also

affect employees' retirement decisions. Studies have indicated that in the 1980s, around

40% of large firms (with more than 1,000 employees) reduced their labor force by providing an early-retirement incentive gateway (Han & Moen, 1999; Hardy, Hazelrigg, & Quadagno, 1996).

Even after the passage of ADEA, the perception of age discrimination in the workplace still affects people's retirement decisions. Studies show that older workers who perceive that their employers favor younger workers over older workers when assigning promotions are more likely to opt for early retirement (Adams, 2002). Age discrimination in the hiring process can result in longer periods of unemployment after a worker leaves a job (Adams, 2002), which may result in involuntary retirement (Polsky, 1999).

Over the course of a lifetime, people tend to follow a timeline that corresponds to social expectations. Ekerdt's (1998) study showed that the timing norms for retirement in a workplace affect older workers' expectations about the timing of their own retirement. The results of the study indicated that the perceived usual age of retirement in a workplace corresponded to the age at which workers expected to retire; also, the perceived usual age of retirement tended to be the same as or a little later than the age at which a worker was eligible for early pension benefits (Ekerdt, 1998). In the 1992 Health and Retirement Study, about 15% of older workers stated that their coworkers made them feel they ought to retire before age 65. Workers who feel such peer pressure regarding retirement age are more likely to think that the usual age of retirement is earlier rather than later, and this in turn facilitates early retirement (Ekerdt, 1998). However, the perception of time norms for retirement varies by job type. Professional-managerial

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workers and skilled blue collar workers are more likely to perceive a standard age of retirement, as compared to workers in sales, clerical positions, food preparation, and health services. Moreover, the usual perceived age of retirement is higher (greater than age 62) for workers in food preparation and health services (Ekerdt, 1998; Erber, 1989). Cleveland and Shore (1992) indicated that the perception of age appropriateness regarding the timing of retirement is affected by the age composition in the workplace. When an employee as well as his/her supervisors thinks that the employee is much older than his/her co-workers, that employee is more likely to opt to retire (Cleveland & Shore, 1992).

In addition to age discrimination in hiring and promotion, an actuarially unfair pension system that discriminates against workers who have reached an advanced age also discourages older workers from continuing to work (Parsons, 1996).

Age discrimination prevents people from working. On the other hand, work accommodations provided by employers that adjust for workers' health limitations could promote delayed retirement. Daly and Bound (1996) found that such accommodations commonly include a change in job duties, assistance with the job, a change in schedule, and a shorter work day or more breaks (Daly and Bound,1996). Among these accommodations, flexibility in working hours is the one most frequently mentioned in the studies. Previous studies have indicated that the option of flexible hours (or phased retirement programs) provided by companies can encourage an extended working life (Charles, 2007; Scott, 2007); this option is more common among smaller, non-unionized service sector companies (Scott, 2007).

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The preceding sample of studies demonstrates that meso-level organizational factors contribute to an individual's timing of retirement. A company can influence the timing of its employees' retirement by explicit means, such as age discrimination, or by more implicit means, such as age norms and early retirement incentive programs. It is worth noticing that even though most of the studies that examine organizational factors focus on company policies and behaviors that induce early retirement, studies that focus on work accommodations show that companies can also play an active role in promoting delayed retirement.

Micro Approach

The third common approach to the study of retirement decisions is the micro approach, which focuses on how the characteristics of individuals affect their retirement behaviors. The micro approach can thus explain variations in individual behavior with respect to participation in the labor force. Factors proposed by previous studies include economic factors, which affect people's motivation to choose work over leisure (Flippen & Tienda, 2000; French, 2005; French & Jones, 2007); work-related factors (Flippen & Tienda, 2000; Hayward & Hardy, 1985; Kosloskia, 2001); and opportunity and barrier factors (Flippen & Tienda, 2000; Kosloskia, 2001; Szinovacz & Davey, 2005; Szinovacz, Deviney, & Davey, 2001).

Numerous studies have focused on the factors that affect people's desire to keep working in later life. The factors proposed by those studies are mostly economic and work-related factors. Private savings, retirement benefits, and Social Security or public assistance programs are the three main sources of income for retired elderly persons.

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According to a cost-benefit framework, economic factors such as pension coverage, personal savings, net worth, and health insurance for retirees could increase the income replacement rate after retirement, thereby decreasing the opportunity cost of leisure and increasing the desirability of entering retirement (Choi, 2002; Flippen & Tienda, 2000; Hill, 2002). On the other hand, a higher work-related income increases the opportunity cost of giving up a job, and encourages workers to work longer (Cahill, Giandrea, & Quinn, 2008; Choi, 2002; Flippen & Tienda, 2000; Talaga & Beehr, 1995). Empirical studies confirm these arguments based on cost-benefit analysis. Most previous findings indicate that among both men and women, workers who have pension coverage are more likely to retire early (Flippen & Tienda, 2000; Hatcher, 2003; Kotlikoff & Wise, 1989), although the effect is less strong for women than for men (Honig, 1998). This may be due to the fact that men are usually the main source of income in a household. However, Choi's study of older women found that older women with pension coverage are more likely to continue working, but pension coverage has no effect on self-defined retirement. To explain this, the author proposed that women may delay their exit from the labor force in order to earn a vested pension (Choi, 2002). The results also indicated that the predictors of retirement are sensitive to the measurement of retirement.

Due to the high cost of private health insurance for older workers and retirees in the United States, access to private health insurance before age 65 (when Medicare eligibility begins) is especially important for workers under age 65. Most workers access private health insurance through their employer, and so they would take into consideration the availability of post-retirement health insurance coverage through their

employer when making retirement decisions. Previous studies also indicated that older

workers whose company provides health insurance coverage for retirees are more likely

to enter retirement early (Choi, 2002; French & Jones, 2007; Paul, 1999; Rogowski,

2000).

Under a cost-benefit framework, in addition to employer-provided retirement

benefits such as pension and health insurance, which are closely associated with job

characteristics and work history, an individual's net worth or wealth, which reflects one's

lifelong personal accumulation of wealth, also play a significant role in retirement

decision-making. High net worth or wealth makes retirement affordable and decreases the

utility of working income. Previous studies found that people who have higher net worth

or wealth are more likely to enter retirement early (Choi, 2002; Flippen, 2000). On the

other hand, a higher wage means a higher opportunity cost in giving up a paying job.

Researchers have found that people who earn a higher wage are more likely to delay

retirement (Cahill et al., 2008; Choi, 2002; Kotlikoff & Wise, 1989).

In addition to economic factors that directly affect the costs and benefits of

retirement, work-related factors such as human capital factors, job characteristics, and

work attachments also have effects on both the motivation of older workers to stay in the

labor force and the opportunities available to them in the labor force. Flippen (2000)

argued that people with a higher level of education enjoy greater wealth, savings, and

pension coverage, which may induce early retirement, while the higher income they earn

increases the opportunity cost of retirement. Moreover, educated elderly persons enjoy

better health and are less likely to experience involuntary job separation; thus, they are

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more likely to have the option to delay retirement, if they are willing to do so. Cahill, Giandrea, & Quinn (2008) reported that men with a higher level of education are more likely to continue working in old age, while educational level was not a significant predictor of women's retirement (Cahill et al., 2008). On the other hand, Choi (2002) reported that women who have more education are more likely to self-define as retired than women who are less educated.

Previous studies indicated that disadvantaged populations in the labor force and the educational system, such as females and minorities, are also more likely to experience job loss, disability, and involuntary retirement (Burr, 1996; Flippen & Tienda, 2000; Gibson, 1987; Hayward, Friedman, & Chen, 1996).

The nature of the job itself appears to affect older workers' motivation to remain in the labor force. An attractive, challenging job motivates older workers to stay in the job longer, while an unattractive job motivates older workers to retire earlier and pursue other activities. Regardless of its attractiveness, a physically demanding job or a job that requires long working hours not only reduces older workers' motivation to keep working but also limits their ability to prolong their working life. Previous studies indicated that jobs that offer higher autonomy, more opportunities to deal with people or exercise social skills (Hayward & Hardy, 1985; Schmitt, 1979), higher intrinsic satisfaction (Schmitt, 1979), higher job complexity (Hayward & Hardy, 1985), or low physical stress (Schmitt, 1979) increase older workers' motivation to keep working. Thus, older workers who are mechanics, machine operators, or farmers are more likely to retire, as compared to older workers who are managers, professionals, or technical supportive persons (Choi, 2002).

Another critical job characteristic is flexibility in work hours, which allows older workers to adjust their work schedule to maximize the utility of their time allocation. Previous studies indicated that flexible work hours promote a longer working life (Charles, 2007; Hayward & Hardy, 1985; Hill, 2002; Wachter, 2007). Flexibility in hours may also be the reason that self-employed persons postpone the timing of retirement (Cahill et al., 2008).

In addition to objective job characteristics, older workers' subjective attachment to a job also affects the timing of retirement. A positive attitude toward one's work, such as thinking that one's work would be valuable even if it did not earn a monetary reward, or that one would keep working even if money were not needed, also leads to late retirement (Scott, 2007).

In addition to attachment to a particular job, attachment toward the labor market in general has a bearing on the timing of retirement. Empirical evidence indicates that people who have a stronger labor force attachment, represented by a continuous work history, are more likely to stay in the labor force in old age and to work longer hours in old age (Hill, 2002; Pienta, Burr, & Mutchler, 1994).

Whereas the above factors contribute to people's motivation to keep working, there are also some barriers that reduce older workers' opportunities to extend their work life. Previous studies have indicated that nearly one third of older workers perceive their retirement as forced or involuntary (Szinovacz & Davey, 2005). Common factors that limit workers' opportunity to continue to participate in the labor market are health

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problems (Flippen & Tienda, 2000) and job loss (Adams, Prescher, Beehr, & Lepisto, 2002; Chan & Stevens, 2002; Szinovacz & Davey, 2005).

It is well documented that health problems limit older workers' opportunity to pursue a longer work life. Dwyer and Mitchell (1999) indicated that the presence of a functional limitation (ADL/IADL/FL) and self-rated poor health led to an expectation of early retirement. Other studies that were based on self-rated health and disability measurements and that explored the effect of health problems on actual retirement behaviors showed similar results (Bounda, 1999; Cahill et al., 2008; Choi, 2002; Dwyer, 1999; French, 2005). Dwyer and Mitchell (1999) found that workers with some health problems like back pain or circulatory problems are prone to retire early, while workers with musculoskeletal problems are not affected. However, a previous study indicated that workers with chronic illness are likely to delay retirement (Miah, 2007). The inconsistent results provided by previous studies using different health measurements could be interpreted as indicating that health problems that do not limit an individual's ability to work may actually encourage the individual to work longer in order to maintain health insurance coverage and to finance health care spending, while health problems that limit the ability to work lead to early retirement.

Job loss is another major factor that limits older people's opportunity to continue to participate in the labor force. A previous study explored the effects of job loss and found that job loss significantly increases the probability of retirement (Chan & Stevens, 2001). Job loss is considered to be one of the main reasons for involuntary retirement (Szinovacz & Davey, 2005).

The family unit is the most important social unit in an individual's life. Family factors affect all important stages in an individual's life, including retirement. Marital status, the spouse's work status, and the spouse's health are all associated with people's retirement decisions. Previous studies indicated that marital status affects the timing of retirement. Flippen and Tienda's study (2000) indicated that men's timing of retirement is unaffected by their marital status, while older women who are divorced are more likely to postpone retirement. Another study indicated that single women are more likely to work in their old age (Choi, 2002).

The employment status of one's spouse also predicts the timing of retirement. Many studies found that couples tend to retire at the same time, even though the wife is usually younger than her husband. Other studies confirm the previous assumption. Both men and women who have a retired spouse are more likely to retire (Gustman & Mitchell, 2000; Reitzes, Mutran, & Fernandez, 1998; Schirle, 2008; Szinovacz & Davey, 2000; Talaga & Beehr, 1995). However, a study conducted by Choi (2002) provided a contrary finding and showed that husbands' working status does not have an effect on the likelihood that their wives are either retired or self-reporting as retired. Szinovacz and Davey (2000) found that marital satisfaction mediates the effects of having a retired spouse on the decision to retire. A bad marriage encourages spouses to work longer rather than spend time together (Szinovacz & Davey, 2000).

Gustman and Steinmeier (2000), using data from the National Longitudinal Survey of Mature Women, investigated the retirement behaviors of couples and found that husbands with a career wife are more likely to retire early, because dual-career families accumulate

more financial resources for retirement. Husbands with a non-career wife tend to retire at age 65, which indicates that a financial incentive such as Social Security can strongly affect their decision-making. Gustman and Steinmeier found evidence of joint retirement in dual career families, where husbands who have a retired wife are more likely to retire (Gustman & Steinmeier, 2000).

A spouse's pension benefits can also affect the timing of retirement. Studies have shown that a spouse's pension has a strong effect on married women's retirement behavior, but has no significant effect on married men's retirement behavior (Henretta, 1993; Pienta & Hayward, 2002; Szinovacz & Davey, 2000). This phenomenon may reflect the fact that men are more likely to be the main source of financial support in a household, and therefore their income may have a stronger impact on family income.

A spouse's health can also affect people's retirement decisions. Due to the traditional roles of men as breadwinners and women as caregivers, having a spouse in poor health affects a man's desire to keep working, because it increases the utility of the income he will earn. At the same time, having a spouse in poor health imposes the responsibility of caregiving on a woman and limits her opportunity to remain in the labor force. Previous studies indicated that having a spouse in poor health limits women's ability to delay retirement (Cahill et al., 2008; Flippen & Tienda, 2000; Raymo, 2006; Scott, 2007; Szinovacz & Davey, 2000 Szinovacz, DeViney, & Davey, 2001; Talaga & Beehr, 1995). According to Szinovacz , many older women with a husband in poor health perceive their retirement to be involuntary (Szinovacz & Davey, 2005).

Ruhm (1996) indicated that responsibility for caring for relatives is related to marital status and has an impact on the timing of retirement. Ruhm found that married people usually share caregiving responsibility: one spouse increases their working hours to accumulate economic resources, while the other spouse devotes their time to caregiving and decreases their work involvement or retires early. By contrast, single women who have caregiving responsibility need to increase both their work involvement and their caregiving involvement. Previous research indicated that married women who provide more than 10 hours of care per week are more likely to exit the labor force, while single women who provide more than 10 hours of care are more likely to delay retirement (Ruhm, 1996).

The approaches described above give us insight into what factors predict the timing of retirement. Also, previous studies have indicated that the timing of retirement is a response to macro factors, meso factors, and micro factors. This combination of factors is important to keep in mind when considering research design.

CHAPTER 2

THEORETICAL FRAMEWORK

There are several mechanisms through which childbearing patterns may affect

individuals' retirement behavior. This study draws on three theoretical and research

approaches to explore the effects of childbearing on the timing of retirement.

Life Course Theory

Studies based on the life course perspective can give some insight into how

childbearing patterns may impact retirement behavior (Brewster, 2000; Pienta, 1999;

Szinovacz, 2006; Szinovacz, DeViney, & Davey, 2001; Whittington, 2000). Life course

theory emphasizes the links between various spheres of an individual's life, links

between the individual's life and the lives of those who are intimately connected to the

individual, and links between the individual's life and society.

An individual's life spheres are interlinked with each other. A single life event

usually affects many life spheres, such as work, family, and social life. Thus, the

situations and conditions in different life spheres all play a role when an individual makes

a decision about an important life event. In addition, earlier life events influence choices

that affect subsequent life events. The process of an important life transition like

retirement interacts with other long-standing and sequential processes throughout life

(Moen, 2001; Szinovacz, 2003). Thus, people tend to plan their important life transitions according to the stage of their family life, their career plans, and their personal preferences. If the timing of a transition conflicts with social roles in different life spheres (such as the roles of parent, spouse, student, or worker), both the characteristics of the transition itself and the supports and resources available for the transition may be altered. Also, the timing and characteristics of subsequent life transitions may be altered (Gerge, 1993).

Life course theory views the course of an individual's life as intertwined with many other people's lives, rather than as independent from other people. The lives of family members, friends, children, and anyone with whom an individual has a close relationship are linked to an individual's life course (Elder, 1996). Therefore, an individual usually takes the life stages of significant others into consideration when planning for important life events.

The importance of social institutions and historical context is another key feature of life course theory. Individuals' behaviors are shaped by institutional factors (Moen, 2001; Robinson, 1985). These institutional factors, moreover, vary historically across time and place. A particular society has many explicit or implicit rules that define a life transition, that regulate the process or timing of a transition, or that encourage or provoke the occurrence of a transition. Therefore, different cohorts and people from different places may have quite different life paths.

Life course theory pays significant attention to gender effects. It is well established that men and women experience different life course pathways (Elder, 1996;

Moen, 2001). Indeed, the same life transition can imply very different experiences for men and women. To be more specific, gender shapes the incidence, timing, and duration of social roles (Moen, 2001). Also, an individual's family roles and work roles are interdependent (Szinovacz, 2006). Traditionally, women and men play different roles in the work and family spheres. Consequently, differences in the meaning of work for men and women can result in different attitudes toward retirement. For example, a general belief that men's gender role includes being the breadwinner may lead them to have a negative attitude toward retirement and to perceive retirement as the loss of a social role (Anson, 1989). However, an empirical study conducted by Kim & Moen (2002) does not support this theory that men experience a loss of social role after retirement. They found that the transition to retirement is actually associated with an increase in psychological well-being for men, while it has no impact on women's well-being. Moreover, as the lines between gender roles become blurred, differences between the attitudes of men and women toward retirement may gradually diminish in the future.

According to life course theory, the timing of life events, such as the birth of the first child, the departure of the first child, and the emptying of the nest (the departure of the last child), demarcates some of the most important life transitions. The timing of each turning point affects the timing or the occurrence of subsequent life events (Nock, 1979). A transition that does not occur at a standard time—such as bearing a child at a very early or late age—may result in conflicts with social norms or with other social roles. For example, previous studies have indicated that teen pregnancy has negative consequences for a mother's educational attainment (Hofferth, Reid, & Mott, 2001), and educational

attainment plays an important role in people's work trajectories, which may impact an individual's retirement behavior (Bound, 1995).

Gender differences in family roles and work roles also affect retirement behavior. Since 1960, women have reduced by half the amount of time they spend on housework (including child care), while men have doubled the time they spend on housework (Bianchi, 2000). Nevertheless, women still spend a significantly larger amount of time on their homemaker-caretaker role (Bianchi, 2000). Women's family responsibilities, which come with their role as mothers, make them more likely to opt to decrease their work hours or to withdraw from the labor force sometime before retirement, especially during childbearing years (Ginn, 1996; Hardy & Shuey, 2000; Pailhe, 2006). Rexroat and Shehan (1987) indicated that during the childbearing stage, women spend more time on housework and less time on career-related work.

Mothers, especially mothers of many children and mothers who have longer intervals between births, are more likely to have interruptions in their job history, or to have jobs that are compatible with their family responsibilities—usually a part-time job, or a job with flexible hours, or a job that requires less work effort (Drobnič, 1999). Therefore they may be less attached to their job and more inclined to retire early (Wilensky, 1961). The life course approach also indicates that women who delay childbearing have a stronger attachment to the labor force. It is very likely that they will carry the same attachment through later life and thus delay retirement (Hank, 2004; Pienta, 1999).

A later study confirmed the importance of not only the number of children but also the timing and spacing of births on women's participation in the labor force (Joesch, 1994). Sorensen's (1983) investigation of married women's employment patterns after childbirth indicated that 49.1 % of women left the labor force at the birth of their first child, 4.6 % of women left the labor force at the second or later births, and 27.5 % of the women who left the labor force at marriage or the first birth returned to the labor force after the birth of their last child (Sorensen, 1983).

The effect of childbearing on men's work history is less significant. Unlike women, men's breadwinner role motivates fathers—especially fathers who have many children—to work longer and harder in response to childbirth (Sanchez & Thomson, 1997). Their cumulative job performance leads to better financial rewards and retirement benefits that may induce early retirement. However, better work performance may also strengthen one's job attachment and decrease the motivation for early retirement. On the other hand, fathers—especially fathers of many children—are more likely to have a spouse who is not working or who has an interrupted work history. Such men may be motivated to delay retirement until their wives qualify for Social Security spouse benefits or Medicare (Madrian & Beaulieu, 1998). The combined effects of work history and work effort are far-reaching. A longer period of service decreases the chance that one will be laid off in old age (Abraham & Medoff, 1984). In the long run, however, childbearing experience tends to shorten women's length of service, and consequently it limits their opportunity to increase their job security (Honig, 1998; Pienta, 1999). Thus, childbearing may increase the probability of involuntary retirement among women. On the other hand,

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a work history marked by interruptions reduces one's eligibility for social security

payments, pensions, and other retirement benefits. Thus, a lack of financial security in

old age may force older mothers to stay in the labor force longer to make up for their

insufficient financial resources.

The concept of linked lives may also help to explain an individual's retirement

behavior (Szinovacz, 1987, 2006). Given that parents are more likely to be married, and

marital status affects people's retirement behaviors, marital status differences between

childless people and parents also moderate the associations between childbearing patterns

and the timing of retirement (Brown, 2003). Childbearing patterns, especially the timing

of childbirth, have a direct effect on the timing of family life stages in relation to

retirement. For example, whether an individual has young children staying at home,

children going to college, or older children who are starting to work can also play a role

in an individual's retirement decision.

People's family life stage may affect whether they identify themselves as retired.

Choi (2002) compared three groups: mothers with children staying at home, childless

women, and mothers whose children have left home. The last two groups of women are

more likely to self-define as retired, as compared to women with children who are staying

at home or who are temporarily away from home. However, there is no difference in

working status among these three groups of older women (Choi, 2002). Thus, the timing

of childbirth, which is associated with one's family life stage at the time of retirement,

also has an effect on retirement self-identification, especially for women.

Strong family ties and contacts also induce retirement. After exiting the labor force, an individual can spend more time with family members. Research showed that family contacts play a role in retirement decisions. Unmarried childless men are less likely to retire, while unmarried men with monthly contacts with children are more likely to retire (Szinovacz, DeViney, & Davey, 2001). It is possible that people who have more children are also more likely to have children around and to have frequent contact with them, and this circumstance may motivate them to retire early.

In sum, the life course approach sheds light on the ways in which childbearing affects the timing of retirement. Childbearing can interfere with one's sphere of work activity and consequently influence one's work history and retirement decision. Childbearing patterns also have an effect on the character of an individual's family life stage, and in turn family ties at the time of retirement affect retirement decision-making. In addition, men and women experience different life courses after childbirth, which also affects retirement decisions.

Life Cycle Consumption Theory (Lifetime Consumption)

This theory explains how having children impacts people's retirement decisions through lifetime consumption as well as through expected intergenerational transfers. According to life cycle theory, people who are making retirement decisions take into consideration not only the immediate profit of retiring when they are near retirement age, but also the larger framework of lifetime consumption and lifetime income (Hatcher, 2003). Modigliani & Brumberg (1954) argue that rational workers will plan their lifetime consumption before retirement, because lifetime consumption cannot exceed lifetime

income. Thus, they will plan the timing of retirement carefully in order to accumulate enough savings to match their expected future consumption. Therefore, factors that affect both lifelong income (i.e., past income and expected future income, including work relevant income, capital income, heritage, public transfers, and other income) and lifelong consumption (i.e., past consumption and expected future consumption) are included in the retirement decision-making process (Modigliani & Brumberg, 1954). Subsequent studies on people's saving and wealth accumulation behaviors have provided empirical evidence that the bequest motive should be incorporated into life cycle theory. In other words, people will accumulate enough lifelong income in order to finance both their own lifelong consumption and the bequests they plan to make (Kotlikoff, 1988; Kotlikoff & Summers, 1981).

Because childbearing responsibility affects both consumption in earlier life stages and expected future consumption after retirement, it affects people's retirement decisions (Browning, 2002). A previous study explored the relationship between childbearing and consumption during childbearing years. Using data from the Household Expenditure Survey conducted by the Australian Bureau of Statistics, Valenzuela (1999) compared the actual money spent on specific commodity items by both single-parent and couple households with different numbers of children (from zero to three). For both single-parent and couple households, households with children spent more money than childless households on housing, fuel and power, food, clothing and footwear, household goods, transportation, recreation and entertainment, and other categories. The only exceptions were expenditures on alcohol and tobacco: childless households spent more money on

these goods. The number of children affected expenditures in both single-parent and couple households. Households with two or three children spent more money in most categories than those with only one child. Again, the only exceptions were alcohol and tobacco: people with two or more children spent less money on alcohol and tobacco (Valenzuela, 1999). Unfortunately, a similar study using U.S. data has not been conducted.

In the United States, it is well known that parents usually provide financial support to their young children and adolescents. However, the fact that many parents also support their young adult children is less recognized by the public. Cooney (1992) indicated that children in their 20s actually receive more financial support from their parents than they did when they were younger. Thus, the amount of financial support that children receive from their parents does not peak until the children are young adults; only when adult children reach the age of 30 does the total amount of support they receive from their parents begin to decline (Cooney, 1992). About 13 % of older parents made financial transfers to their children who are 18 years old or older. The average financial transfer made to an adult child over the previous 10 years was around $4,000 (McGarry & Schoeni, 1997).

From the lifetime consumption perspective, which considers both current and expected future financial transfers to young adult children, parents, especially those who have many children, may need to stay in the labor force longer in order to accumulate enough savings to cover the cost of childbearing. It is also possible that the effect is stronger among men, since men usually play the breadwinner role. Moreover, since

people plan the timing of retirement in the context of their total lifelong savings and lifelong consumption, the number of children rather than the timing of children may be a more important factor.

Compared to childless elderly persons, parents have a stronger bequest motive. Given that people who have a strong bequest motive have a strong motivation for wealth accumulation, parents may plan to earn more income over the course of a lifetime in order to accumulate both retirement savings and funds for bequest (Kotlikoff & Summers, 1981). It is possible that compared to childless elderly persons, parents may be more likely to delay retirement in order to accumulate more wealth to cover inheritances. However, this hypothesis is based on the assumption that childless people, or parents with fewer children, will save money they would otherwise have spent on children. An alternative hypothesis is that people with no children or fewer children may spend as much money on other types of consumption, thus offsetting the savings from the absent or reduced childbearing cost. Therefore, the real effect of childbearing on retirement behavior through lifetime consumption deserves further exploration.

Intergenerational transfers may also occur in the opposite direction, from children to parents. Thus, the expected or actual support provided by adult children to their parents could also affect both past savings and future consumption. Some studies have explored intergenerational transfers from adult children to their elderly parents, focusing on the disadvantages faced by childless elderly persons. The childless elderly may suffer from a lack of support, because they do not have any adult children to take care of them in later life. Zissimopoulos's (2001) study of financial transfers from adult children was based on

the 1994 HRS survey and examined parents ranging in age from 53 to 63. The research

results showed that 34% of parents in the survey were receiving financial or instrumental

support from their children: 15% of parents received financial transfers, 5.4% received

personal care, and 23% received help with household chores from their children. Among

parents who received money, the average gift from a single child was $1,259 annually

(Zissimopoulos, 2001, p. 9), while for those who received transfers from multiple

children, the average amount was about $3,300 annually (Zissimopoulos, 2000, p. 20).

Another study examined how much adult children transfer to their parents, using the

Panel Study of Income Dynamics. In this study the adult children ranged from age 25 to

60. The results indicated that adult children on average give their parents less than $100

annually (Couch, Daly, & Wolf, 1999). It is also possible that elderly parents might see

their adult children as substitutes for insurance, or as a source of emergency support. This

implies that parents with adult children could afford to set aside a smaller amount of

precautionary savings and therefore retire early.

However, these two proposals—that elderly parents see their adult children as

sources of financial and in-kind support or as a substitute for insurance—are not

supported by research. Studies indicated that the average amount of transfers from adult

children to older parents is very limited (Couch, Daly, & Wolf, 1999; Zissimopoulos,

2001). Thus, it may be inferred that any effect of these transfers on the parents' savings

habits and their retirement plans would be minor (Zissimopoulos, 2001). Another study

used the Asset and Health Dynamics survey and the Panel Study of Income Dynamics to

test the hypothesis that parents see their adult children as substitutes for insurance; this

study also concluded that even though some parents do end up receiving care from their adult children, they did not plan on receiving such support (Mellor, 2001). Thus, the assumption that parents save less money because they plan on receiving support from their children is not borne out by research.

Neoclassical Economic Theory

Neoclassical economic theory provides another perspective that gives insights into the mechanisms through which childbearing patterns affect people's retirement behaviors. Neoclassical economic theory suggests that individual agents aim at maximizing utility, subject to their resource constraints. Retirement decision-making could be seen as the decision to allocate time in order to maximize its utility, a decision that should be made rationally. In other words, an individual contemplating retirement would assess the comparative costs and benefits of staying in the labor force versus exiting from the labor force and make a retirement decision accordingly (Boyer & Smith, 2001; Hatcher, 2003).

Economists suggest that there is a trade-off between paid work and leisure. Leisure is defined as non-paid activity, including housework. Time spent on leisure can increase personal well-being. On the other hand, time spent on paid work can also increase personal utility by generating income and therefore can support more consumption. Since individuals have a limited amount of time at their disposal, time spent on leisure can only be increased at the expense of time spent on paid work and a corresponding loss of income, while the opportunity cost of income is the loss of

corresponding leisure time. Therefore, decisions about the allocation of time will be made based on the marginal rate of substitution of salary for leisure activities (Schulz, 2001).

Previous studies divided the factors that predict retirement into pull factors and push factors. Pull factors, which increase the utility of work and attract workers to stay in the labor force longer, include high wage rates, work relevant income, and fringe benefits. Push factors could either decrease the utility of work or increase the utility of leisure and thus induce early retirement. For example, family income, excluding personal earnings such as income, social security, pension, and capital income, decreases the utility of work, while family care obligations increase the utility of leisure time (Quinn, 1977; Flippen and Tienda, 2000).

Some studies revealed the effects of childbearing experience on wage rates. Neoclassical economic theory sees job interruptions and reductions in working hours during the childbearing years as discontinuities in human capital accumulation, and also as causes of skill depreciation, which reduces an individual's market value in the labor force (Gangadharan and Rosenbloom, 1996). In other words, job disruptions would disadvantage a mother with respect to productive skills and technical knowledge, and this in turn would be reflected in her wages, even though the effect of childbirth on working hours is reduced as time goes on (Gangadharan and Rosenbloom, 1996). Exploring the effect of another child on married women's labor supply and income, Gangadharan and Rosenbloom (1996) found that even 6 to 12 years after childbirth, a mother with an additional child made about 14% less. A comparison of 1980 and 1990 data showed that in 1990, the negative effects that having additional children had on wages were more

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pronounced and persistent. A possible explanation may be that women in 1990 had much better opportunities than women in 1980 did to get a job that requires human capital accumulation. In addition to the number of children, the timing of childbirth also plays a role. A later study examining the timing of childbearing on women's wages indicated that childless women and women who delayed childbirth received a higher wage (Taniguchi, 1999). Hofferth (1984) explored the effect of delayed childbearing on the economic status of women who were 60 or older in 1976. The research results showed that women who delayed their first childbirth until after age 30 had greater assets, higher family incomes, and a higher standard of living compared to women who had their first child sometime before age 30 (Hofferth, 1984).

Since the family is the basic economic unit for married people, not only individual-level factors but also family-level factors should be taken into account. In addition to the individual's wage, the family's total income is another factor that affects an individual's retirement decisions. Given the same individual wage income, the higher the family income, the less important the wage income is to an individual. Thus a higher family income (excluding personal wage income) lowers the utility of working. This is especially the case in a household where one party (usually the wife) spends a long time staying at home and therefore accumulates low human capital, while another party is the main economic source in the family. Compared to a high family income, a comparatively low individual wage may be easily forgone in exchange for leisure time.

Previous studies also indicated that the presence of young adult children, especially dependent children (under 18), could affect retirement decision-making by

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imposing a financial burden on workers, therefore leading workers to stay in the labor force longer (Cooney, 1992; McGarry & Schoeni, 1997; Quinn, 1977).

In sum, under the cost-benefit analysis framework, childbirth patterns affect the timing of retirement through many different offset factors. Women who have more children increase the possibility that they will receive low wages and low unearned income. A low-wage job has a low opportunity cost and therefore induces early retirement, while low unearned income encourages a delayed retirement. On the other hand, women who delay childbearing enjoy high earned income and high family income assets, while they also have a higher financial obligation to dependent or young adult children. Higher income and a higher financial obligation encourage delayed retirement, while higher assets and unearned income induce early retirement.

The model also predicts that men's retirement behavior should be less affected by childbirth patterns, since men's working income, as well as their retirement benefits, has a weaker relationship to childbirth patterns. However, childbearing patterns may still affect men's timing of retirement if they impose an increased financial burden. A father who has more children or younger children may decide to postpone retirement in response to the high cost of raising children.

The Definition of Retirement

Over the past decades, retirement has become a blurred transition rather than a rapid one-stop transition (Burr, 1996; Quinn, 1999). Even though retirement has been frequently investigated by researchers, the definitions and measurements of retirement are inconsistent across studies. Previous researchers have observed that the predictors of

retirement are sensitive to the definition of retirement being used (Beehr, 1986; Samwick, 1998).

According to Ekerdt and DeViney (1990), there are some major criteria that have been commonly used in the literature: separation from a career job (Hardy, 1991; Quinn, 2000), exit from the labor force or reduced effort (Dentinger 2002; Hayward, 1986; Reitzes et al., 1998), pension receipt (Han & Moen, 1999), and self-defined retirement (Adair, 1993). But each criterion has its own advantages and disadvantages, and can only measure some dimensions of retirement. There is no one measurement that can serve the needs of every study (Ekerdt & DeViney, 1990).

The disadvantage of adopting the operational definition of retirement as separation from a career job is that it requires defining a career job as well, which creates extra complexity and inconsistency in definition (Ekerdt & DeViney, 1990). In the literature, there are many ways of defining a career job, including a job with at least five years of work, a job with at least ten years of work (Quinn, 2000; Quinn & Burkhauser, 1990), or the job that an individual has held for the longest time. However, with the increase in the variety of work patterns displayed by older workers, defining a career job based on the criteria mentioned above becomes very complicated. For example, an individual may have worked at several jobs for at least five or ten years; also, according to these definitions, some people may never have had a "career job" and therefore cannot satisfy the criteria for being retired (Ekerdt & Deviney, 1990; Szinovacz, Chung, Quinlan, & Davey, 2007).

Labor force exit is another common criterion for measuring retirement. Exit from the labor force could be simply defined as the cessation of labor activity. However, the drawback of using labor force exit alone as a criterion is that people who are unemployed, between jobs, or occasional or seasonal workers would all qualify as retired. Another disadvantage of using this definition is that workers with a minimal attachment to work would be categorized as unretired, even though their lifestyle and their income sources are more similar to those of people who do not work at all (Ekerdt & Deviney, 1990). However, this definition is especially useful when estimating the size of the older working population.

Instead of treating retirement as a discrete event, Beehr (1986) proposed that retirement could be treated as a continuous process and that working hours could be used as a measurement of the level of retirement (Beehr, 1986). Measurements of weekly working hours, yearly working months, and reduced income were adopted as indicators in various studies (Reitzes et al., 1998). Sometimes a series of ordinal measurements was included in the model, usually categorized as not retired at all, partially retired, and fully retired.

The receipt of pension or Social Security benefits was also used as a measurement of retirement in some studies (Haveman, Holden, Romanov, & Wolfe, 2007; Herz, 1995; Moen, Kim, & Hofmeister, 2001). The receipt of Social Security or pension benefits usually comes with some kind of retirement test that requires either a reduction in working hours or separation from the current employer. The pitfall of using pension receipt as a criterion is that among private workers of all ages, only about 40% of

workers are covered by pensions (Diane, 1995; Ekerdt & Deviney, 1990; Munnell &

Perun, 2006). Moreover, pension entitlement varies widely among different subgroups of

people. It is known that pension coverage rates among men and whites are higher than

among women and minorities (Macmillan, 2003; Munnell & Perun, 2006). According to

Parnes (1985), defining retirement by the receipt of pension or Social Security benefits

will classify the largest number of people as retirees. A large number of people who

receive Social Security or pension benefits do not meet any other criteria for retirement

(Parnes, 1985). However, using the receipt of pension or Social Security benefits as a

definition of retirement is especially beneficial for research on the financial stability of

Social Security or pension plans, as well as for studies focusing on either the economic

status of the elderly or the consumption and saving patterns of the elderly.

The timing of the receipt of Social Security benefits and the timing of labor force

exit are close to each other in many cases. Since Social Security income and pension

income are important sources of retirement income, many people wait to retire either

until they are eligible for an employer pension (60 is a popular age for eligibility), or until

they are eligible for Social Security under early retirement (62) or normal retirement (65+)

(Ruhm, 1995).

Self-defined retirement is another criterion that is commonly used in studies. It is

also widely available in survey data. The drawback of using self-defined retirement as a

criterion is that this is a subjective measurement, and so two people in the same situation

may define their status differently. Full-time workers may define themselves as retired,

while a non-worker may define himself/herself as unretired. Also, wives' retirement

identification is influenced by their husband's retirement status (Belgrave, 1989).

Moreover, gender and race have an effect on people's self-definition as retired (Gibson, 1987a; Szinovacz & DeViney, 1999). Another trait that can affect self-definition is childlessness: Choi (2002) found that, compared to mothers who have stopped working, childless women who have stopped working are more likely to define themselves as retired. On the other hand, the strength of using self-defined retirement as a retirement measurement is that it can distinguish retirement from other labor force transitions, such as unemployment, a temporary leave, or a job change. Often, only an individual himself/herself knows whether his/her intention in making a labor force transition is to enter retirement. Furthermore, according to Parnes and Less (1985), self-defined retirement is a comparatively conservative operational definition. Self-defined retirement rarely stands alone without other indicators (Parnes, 1985). Its overlap with other predictors makes self-defined retirement a good proxy of retirement when there is only one criterion used in the analysis. Since each criterion only measures one aspect of the retirement transition, adopting multiple criteria may be a way to reduce, if not resolve, the inconsistency. In some studies, a combination of criteria has been used—for example, a combination of labor force exit or reduced working hours, self-defined retirement, and lack of interest in returning to the labor force (Doshi, Cen, & Polsky, 2008; Szinovacz & Davey, 2005b). Other studies use a combination of self-reported work-retirement status and reduced work hours to define retirement status (Reitzes, Mutran, & Fernandez, 1998; Scott, 2007).

Combining different retirement indicators may satisfy the requirement for both subjective and objective dimensions in the definition of retirement. However, methods for resolving the discrepancies between different measurements are arbitrary, and so different ways of combining subjective and objective measurements could lead to different research results. Because the study of retirement in general is very sensitive to the operational definition of retirement, this study will separately assess the effect of childbearing on (1) those who are subjectively self-defined as retired, and (2) those who have withdrawn from the labor force and are thus objectively defined as retired. Therefore, this study can capture how childbearing patterns affect different dimensions of retirement.

CHAPTER 3

METHODOLOGY

Data

The data for this study comes from the Health and Retirement Study (HRS) waves

1–7: 1992, 1994, 1996, 1998, 2000, 2002, and 2004. The HRS is a nationally

representative survey of older Americans conducted by the Institute for Social Research

at the University of Michigan. The first wave was conducted in 1992, with all subsequent

waves occurring every two years. The primary sample in the HRS is respondents who

were between the age of 51 and 61 in 1992, and their spouses of all ages.

The Rand HRS data file, a cleaned and user-friendly version of the HRS data

developed by Rand Corporation, has also been used to construct many variables in the

analysis (Getting Started with the Health and Retirement Study, 2006).

Sample

In order to focus on respondents who were at risk of retirement, the research

sample was limited to respondents who were working for pay and self-defined as

unretired at age 51 or older in 1992. Respondents from the Asset and Health Dynamics

among the Oldest Old (AHEAD) cohort were excluded from the analytic sample because

their work-related measurements are inconsistent with the HRS variables. Only

respondents who identified themselves as White, Black, or Hispanic were included in the analytic sample. Respondents who identified as other races were excluded from the analysis, because only a small number of those people in the sample were working at the time of their first interview. Respondents whose records were missing data on retirement status and timing of retirement were also excluded.

The Analysis Strategy

This study will be conducted in three stages. First, descriptive statistics are used to describe the main features of the research sample. Mean and standard deviation of all variables (including both demographic and childbearing variables) are reported.

Second, when examining retirement trends among women with different childbearing patterns, I am tracking the timing of labor force exit/self-define retirement by using Kaplan-Meier survival analyses without adjusting for any control variables. A log-rank test is then applied to test for equality across strata. Looking at Kaplan-Meier survival curves for all the childbearing pattern predictors before proceeding to more complicated models will provide insight into the shape of the survival function for each group of women with different childbearing patterns. The log-rank test can indicate whether there are statistically significant differences between groups (Bruin, 2006). Kaplan-Meier survival curves can reveal the length of time that a particular fraction of the sample remains in the labor force or continues to define themselves as unretired.

Third, Cox proportional hazards modeling is employed in the study. Retirement is treated as a discrete-time hazard, which means that retirement is a one-time event. The use of Cox proportional hazards modeling allows the analysis of the influence of multiple

childbearing pattern factors on the timing of retirement, while controlling for other independent variables, over the period of time from age 51 to the onset of the first retirement event. Cox modeling also allows for censored data, as in the case of people who were still working or not yet retired at the end of the study (Cox, 1972).

Some events prevent the occurrence of retirement. Some people may never experience retirement because they either die or experience work disability before the onset of retirement. In order to adjust for the influence of death and work disability on the duration of time to retirement after age 51, work disability and death are treated as competing risks to retirement. Thus, the onset of disability or death prior to retirement excludes the risk of retirement. Consequently, a respondent is at risk of retirement until one of the events (death, work disability, or retirement) occurs, or the respondent is lost to attrition, or the observation period ends.

The first two Cox regression models explore the effect of childlessness on the timing of labor force exit and self-defined retirement separately. The third and fourth models explore the effect of childbearing factors on the timing of labor force exit both with and without controlling for work-related variables, in order to reveal to what extent the relationship between childbearing patterns and the timing of labor force exit is the result of different work-related characteristics among people of different childbearing patterns. The fifth and sixth models explore the effect of childbearing factors on the timing of self-defined retirement both with and without controlling for work-related variables. Moreover, since effects of childbearing patterns on retirement may differ by gender, all analyses will be conducted separately for men and women.

Because this is a longitudinal study, the problems caused by missing values are magnified. A simulation-based multiple imputation approach will be applied and the STATA ICE program will be used to create imputations on the independent variables (Royston, 2009). Missing independent variables will be imputed, while cases with missing dependent variables will be excluded from the analysis.

Measures

Dependent Variables

The dependent variable is the age at the first retirement claim minus age 51, to measure how childbearing patterns affect the duration for which an individual remains unretired after the age of 51. In this study, duration of nonretirement after age 51 is a better fit for testing the theoretical hypotheses rather than duration of nonretirement after the first survey date, because it is expected that the baseline risk of entering retirement would change as a function of age rather than as a function of time over survey intervals.

Because the results of retirement studies are very sensitive to the operational definition of retirement (Choi, 2002), this study will assess the effect of childbearing on subjective self-defined retirement and objective labor force exit separately.

Self-defined retirement is measured by the question, "At this time, do you consider yourself partly retired, completely retired, or not retired at all (1. Completely retired; 2. Partly retired; 5. Not retired at all; 7. Question is not relevant to the respondent. Doesn't work for pay or is a homemaker, etc.)?" Both respondents who consider themselves completely retired and those who identify themselves as partly retired are

defined as retired. The timing of retirement is measured by the question, "In what month and year did you (partly/completely) retire?"

When the self-defined retirement variable is missing, a question about work status is used as a supplement for self-defined retirement: "Now I'm going to ask you some questions about your current employment situation: Are you working now, temporarily laid off, unemployed and looking for work, disabled and unable to work, retired, a homemaker, or what?" If the answer to the question about work status is "retired," the respondent's retirement status is coded as retired. Also, the year and the month of retirement provided in the response to the work status question are used to define the timing of the respondent's self-defined retirement.

Labor force exit is measured by questions about whether the respondent is working for pay, and about the respondent's current job status. Working for pay is measured by the question, "Are you doing any work for pay at the present time (1=Yes, 0=No)?" However, labor force exit does not necessarily indicate retirement. For example, some people may temporarily leave the labor force due to unemployment or other reasons, although they plan to reenter the labor force later. According to previous literature, it is rare for a worker to return to the labor force after two years of not engaging in any labor force activity in old age (Hayward, Hardy, & Liu, 1994). In this study, only those who are not currently working for pay and who have stopped working for at least two years are treated as having exited from the labor force. The timing of a respondent's labor force exit is measured in years and months, as provided by the respondent. The Rand HRS variables "Month and year last job ended" are used. This information is supplemented

with the question, "Were there any months since [MONTH] when you were not working for pay?" and the question, "Which months were those?" Answers to these questions are used to define whether the respondent was not working for pay for more than two years.

Independent Variables

The independent variables are listed and briefly described in Table 1. The main independent variables in this study describe childbearing patterns. Childbearing pattern variables include the number of the respondent's children, the presence of dependent children (children under age 18), and the respondent's age at the birth of the first child. The term "children" in this study includes biological children of both the family respondent and the non-family respondent (spouse), but excludes stepchildren. The child-characteristics variables are constructed by using the children's data file from the first wave. First, one data file is created for the children of the family respondent; then a second data file is created for the children of their partner/spouse (non-family respondent). Finally, the information about the children is aggregated to determine the number of children, and the age of the youngest child. Together, the number of children and the time span between the births of the youngest child and the oldest child reflect both the length and the intensity of the childbearing years, when women have a higher risk of low labor force involvement and incur the cost of bearing and raising children, which may result in insufficient savings. The effect of the length of the interval between the first and the last childbirth was not reported in this study due to a multicollinearity problem: the birth gap combined with other childbearing factors measures the same dimensions as other childbearing factors.

Previous studies have shown that the mother's age at the birth of her first child relates to her educational attainment (Hotz, McElroy, & Sanders, 2005; Marini, 1984), to her wage and work hours (Hotz, McElroy, & Sanders, 2005) and to her career development after completing her education (Card & Wise, 1978). Moreover, the presence of dependent children reflects present and expected future financial transfers to children, which may also affect people's retirement behaviors (Cooney, 1992; McGarry & Schoeni, 1997; Quinn, 1977).

Control Variables

(a) Demographic characteristics, such as race and ethnicity, and health status (self-rated health) were controlled in the study. Race and ethnicity are measured by two dummy variables, "Non Hispanic black" and "Hispanic," while "Non Hispanic white" serves as the reference category. Health status has also been identified in previous studies as an important predictor, as it is expected that people with poor health are more likely to retire early. Health status is measured by self-rating health. Self-rated health is measured by two dummy variables—good and very good health, and excellent health—while fair and poor health serves as the reference group.

(b) Economic factors were measured by (1) personal earnings as a share of family income; (2) personal earnings (log); (3) assets (log); (4) whether the respondent has pension coverage (binary); and what kind of health insurance coverage the respondent has. In addition to the absolute amount of household income, the relative weight of an individual's earnings in a household also plays a role in retirement decisions. It is expected that the higher an individual's earnings are with respect to the family income,

the lower the probability that the individual will retire early. Also, because both personal earnings and family assets have been found to follow a highly skewed distribution, log transformation will be applied to both earnings and family asset variables. To make it possible to compare the variation between waves, the largest absolute value of any negative numbers among the seven waves, plus 1, is added to the family income variables in all seven waves to avoid taking the log of a negative number or 0 before log transformation. The same procedure applies to the family assets variable as well. Pension coverage is measured by a Rand HRS variable indicating whether the respondent has any pension from a current job. It is expected that people who have pension coverage from a current job are more likely to retire early, since previous research indicates that pension is an inducement to retirement. Health insurance is measured by a set of dummy variables, including (1) respondent is covered by the job and coverage may continue into retirement; (2) respondent is covered by the job but coverage will not continue into retirement; (3) respondent is covered by federal government health insurance plans (including Medicaid, Medicare, VA/CHAMPUS, or other government health insurance); and (4) respondent is covered only by spouse's health insurance from an employer. A hierarchy-coding rule is applied to the health insurance variable, which means that only people who do not have the previous category of health insurance could qualify for the next health insurance category. The reference group includes respondents who do not have any of the health insurance coverage listed above.

(c) Human capital factors were measured by educational level, which is coded as a series of dummy variables: "some college," "college graduate," or "post College," while "high school graduate or less" serves as the reference group.

(d) Work-related factors were measured by work history (total years worked), work value, and age-discrimination variables.

Work value is measured by combining the responses to two statements: (1) "Work is important by itself and not just because of money (1. strongly agree; 2. agree; 3. disagree; 4. strongly disagree)"; and (2) "Would keep working even if the income were not needed (1. strongly agree; 2. agree; 3. disagree; 4. strongly disagree)."

After reverse coding, higher scores indicate a higher level of agreement. There is a high correlation between the belief that work is important and the desire to keep working even if the income is not needed. Adding the scores of these two responses yields a work value variable, where a high score reflects the respondent's perception of the importance of work.

Age discrimination is measured by two different variables: age discrimination in promotion, and retirement pressure from peers. Due to the low correlation between the two variables, they will be incorporated into the regression model separately. Promotion discrimination is measured by the response to the statement, "In decisions about promotion, my employer gives younger people preference over older people." For respondents who say that they agree or strongly agree with the above statement, the discrimination variable is coded as 1, "perceived age discrimination in promotion." If the respondent either disagrees or strongly disagrees with the above statement, the promotion

discrimination variable is coded as 0, "perceived no age discrimination in promotion."

Respondents who are self-employed are also coded as 0, because self-employed people

will not perceive any promotion discrimination. It is expected that people who perceive

age discrimination will perceive the workplace as less friendly and will thus be more

likely to retire early.

The second variable is the peer pressure variable, which is measured by the

response to the statement, "My coworkers make older workers feel that they ought to

retire before age 65." Respondents who agree or strongly agree with this statement are

coded as 1, "perceives retirement pressure from peers." If the respondent disagrees or

strongly disagrees with the statement, the peer pressure variable is coded as 0, "perceives

no retirement pressure from peers." Self-employed individuals are also coded as 0,

because self-employed people will not perceive any age discrimination from coworkers.

People who perceive age discrimination by their coworkers are expected to perceive that

the workplace is less friendly and are thus less likely to prolong their working life.

(e) Family and spouse characteristics were measured by marital status and spouse

working status ("spouse working" or "spouse not working," while "no spouse" serves as

the reference group), and spouse's health status ("spouse's health is good, very good, or

excellent" or "spouse's health is fair or poor," while "no spouse" serves as the reference

group). According to life course theory, a person's life is intertwined with the lives of the

people who are close to them. Previous studies indicated that people who have a retired

spouse are more likely to retire. Moreover, the health status of a spouse has a different

impact on the working status of men and women (Szinovacz & DeViney, 2000).

(f) Age is included in the study in order to adjust for age-graded transition risks. Age is calculated by difference from age 51 to give the measure a meaningful zero. Age square is also introduced into the analysis model to detect curvilinear age effects.

Variables which change over time, such as self-rated health, personal earnings as a share of family income, family income, wealth, health insurance for retirees, perceived promotion age discrimination, perceived retirement pressure from peers, marital status, spouse's working status, and spouse's health status are coded as time-dependent variables. All of the above variables are controlled in order to reveal the net effects of childbearing patterns on the age of retirement.

Research Limitations

Due to limitations in the HRS data, information on respondents' job history during the childbearing period is unavailable. Thus, job interruptions during the childbearing years could not be controlled in the analysis.

Due to data limitations, respondents who retired before the age of 51 were excluded from the study. Thus, the research results do not explain the effect of childbearing patterns on very early retirement (before age 51).

This study only explores the effects of childbearing pattern variables on the onset of first retirement. Thus, the research results do not explain retirement processes following the first retirement transition.

Given the increasing proportion of minorities in the general population, it would be desirable to explore the retirement patterns of other races and ethnicities. However, because the minority sample size in wave 1 (1992) is small, this study excludes people

other than Whites, Blacks, and Hispanics. Thus, the research results cannot be used to

explain how childbearing patterns affect the timing of retirement of other populations.

CHAPTER 4

RESEARCH RESULTS

Sample Characteristics

Means and standard deviations of the independent variables, including

respondents' demographic characteristics at the time of the 1992 interviews, are shown in

Table 1. Among the female respondents, around 74% are non-Hispanic White, 19% are

Black, and 7% are Hispanic. The majority of the respondents are high school graduates or

less (79%) while about 13% have some college education or have graduated from college.

Fewer than 8% of the respondents have a post-college degree. The mean age of the

respondents is about 55. The majority of them are married (66%). On average, a

respondent has 2.94 children. About 8% of them are childless. More than half (54%) of

them had their first child before the age of 22, while 15% of them had their first child

after the age of 30. The average gap between the first child birth and the last child birth is

6.91 years. The mean assets and earned income of respondents are about $199,902 and

$18,793 respectively. More than half (53%) of them have pension coverage. Almost 31%

have employer-provided insurance that covers retirees and 23% of them have employer-

provided insurance that does not extend to retirees. Only 3% of the women are covered

by government-provided health insurance, while 24% are covered by their spouse's

health insurance. About 12% of the respondents perceive that their employer gives younger people preference over older people when making promotions, while almost the same (11%) proportion of respondents reported that their coworkers make older workers feel that they ought to retire before age 65. On average, a female respondent had worked for 27.6 years before the interview in 1992.

As for the male respondents, about 77% are White, 13% are Black, and about 9% are Hispanic. The majority of respondents are high school graduates or less (73%) while about 16% of the men have some college education or a college degree. Only about 11% of the men have a post-college degree. The mean age of male respondents is about 56. The majority of them are married (85%). On average, a male respondent has 2.73 children. About 11% of the men are childless. About a quarter of them (24%) had their first child before the age of 22 and 29% of them had their first child after the age of 30. The average birth gap between the first and the last child birth is 6.98 years. The mean assets and earned income of male respondents are about $266,000 and $35,250 respectively. More than half (56%) of them have pension coverage. Almost 46% have employer-provided insurance that covers retirees, while 21% of them have employer-provided insurance that does not extend to retirees. Of the male respondents, 4.3% are covered by government-provided health insurance, and only a few (9.8%) are covered by their spouse's health insurance. Around 14% of the male respondents perceive that their employer gives younger people preference over older people when making promotions, while almost the same (13%) proportion of respondents reported that their coworkers

make older workers feel that they ought to retire before age 65. On average, men had

worked for 36 years before the interview in 1992.

Table 1. Means and standard deviations of individual and family characteristics (not weighted) of parents by gender

	Female (2,980)		Male (3,498)	
Dependent variables	Mean	SD	Mean	SD
White	0.74	0.44	0.77	0.42
Black (1=yes)	0.19	0.39	0.13	0.33
Hispanic (1=yes)	0.07	0.26	0.09	0.28
High school graduate or less	0.79	0.41	0.73	0.44
Some college or college graduate	0.13	0.34	0.16	0.36
Post-college degree	0.07	0.26	0.11	0.31
Age (age-50)	5.08	3.39	6.05	4.09
Marital status (1=married 0=unmarried)	0.66	0.47	0.85	0.35
Number of children	2.94	1.82	2.73	1.82
Childless	0.08	0.27	0.11	0.31
Has a dependent child	0.10	0.30	0.20	0.40
Had first child before the age of 22	0.54	0.50	0.24	0.42
Had first child after the age of 30	0.15	0.35	0.29	0.45
Birth gap	6.91	5.42	6.98	5.98
Total assets	$199902.00	$428439.30	$267744.00	$530378.30
Respondent's earned income	$18793.00	$16070.01	$35250.08	$43280.59
Has pension coverage	0.53	0.50	0.56	0.50

|				
Personal earnings/ household income	0.51	0.34	0.63	0.30
Respondent is self-employed	0.13	0.34	0.22	0.42
Employer provides health insurance for retirees	0.31	0.46	0.47	0.50
Employer does not provide health insurance for retirees	0.23	0.42	0.21	0.41
Government-provided health insurance	0.03	0.17	0.04	0.20
Covered by spouse's health insurance	0.24	0.43	0.10	0.30
Employer prefers younger workers	0.12	0.33	0.14	0.35
Retirement pressure from coworkers	0.11	0.32	0.13	0.34
Total years worked	27.60	10.51	36.34	8.15

Analytical Results-Kaplan-Meier Curves

Due to potential gender differences in the timing of retirement, the analyses are broken down by gender. Also, two different measures of the timing of retirement, timing of labor force exit and assuming the retirement identity as a retiree, are considered in the study.

All of the following analyses begin by exploring the effect of childlessness on the timing of retirement (measured by the timing of labor force exit and the timing of assuming the retirement identity). The analyses then compare the shapes of the survival function for different groups of parents, including parents with or without dependent children, parents who had their first child at different ages, and parents who have one, two, or three or more children.

**Childbearing patterns and the timing of labor force exit**

Figure 1 shows the survival (labor force exit) curve of both mothers and childless women. It seems that childless women are more likely to exit the labor force early. However, the results of the log-rank test are not statistically significant (p= 0.6616). Thus, when other factors are not controlled, mothers and childless women are not different in the timing of labor force exit.

Figure 1. Motherhood or childlessness and the timing of labor force exit.
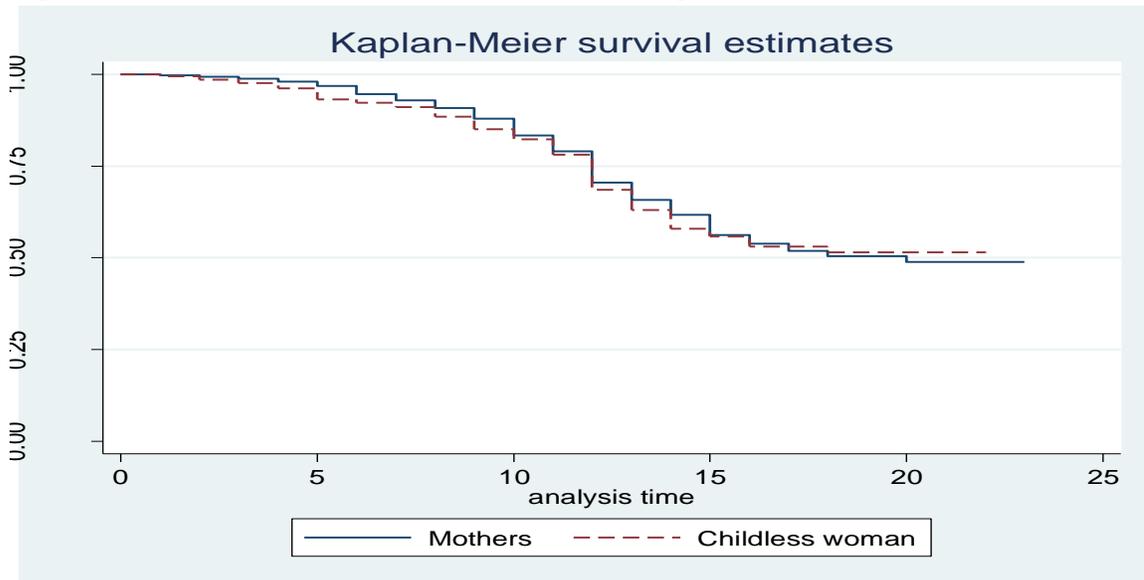

The survival curves of mothers with dependent children and mothers without dependent children (under age 18) are compared in Figure 2. Mothers with dependent children are more likely to stay in the labor force. The result of the log-rank test shows that the difference between the two groups is statistically significant (p= 0.0085).

Figure 2. Presence of dependent children (under age 18) and the timing of mother's labor force exit.

Kaplan-Meier survival estimates

Without dependent children   ----- With dependent children
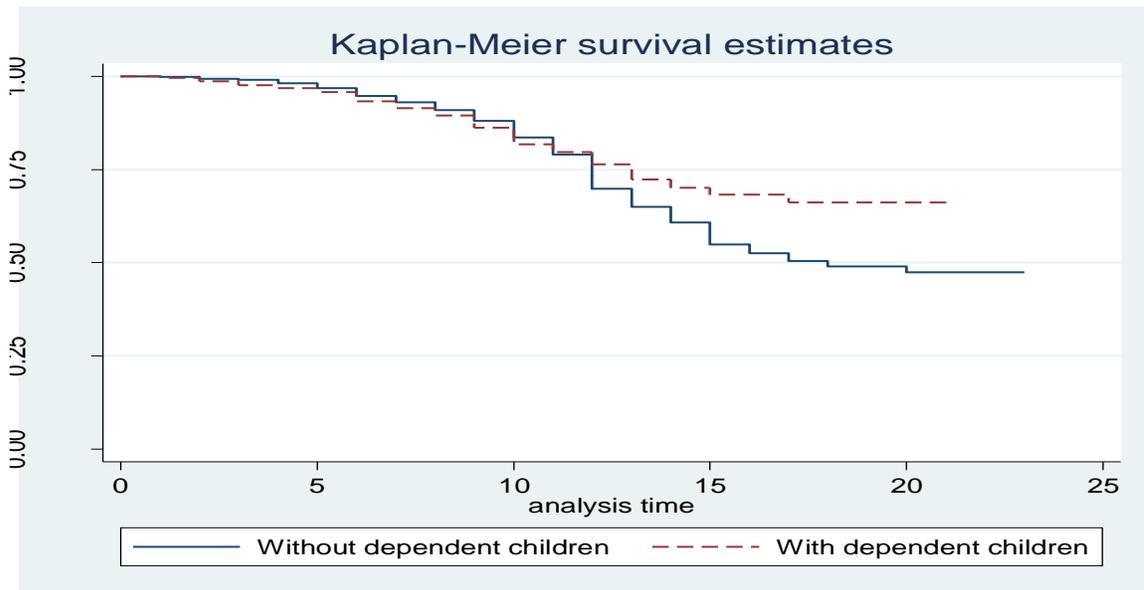
Figures 3 and 4 illustrate how a mother's age at her first childbirth relates to the number of years she remains in the labor force after age 51. Figure 3 compares the timing of labor force exit for mothers who had their first child before the age of 22 and mothers who had their first child at the age of 22 or after.

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Figure 3. Early first childbirth and the timing of mother's labor force exit.
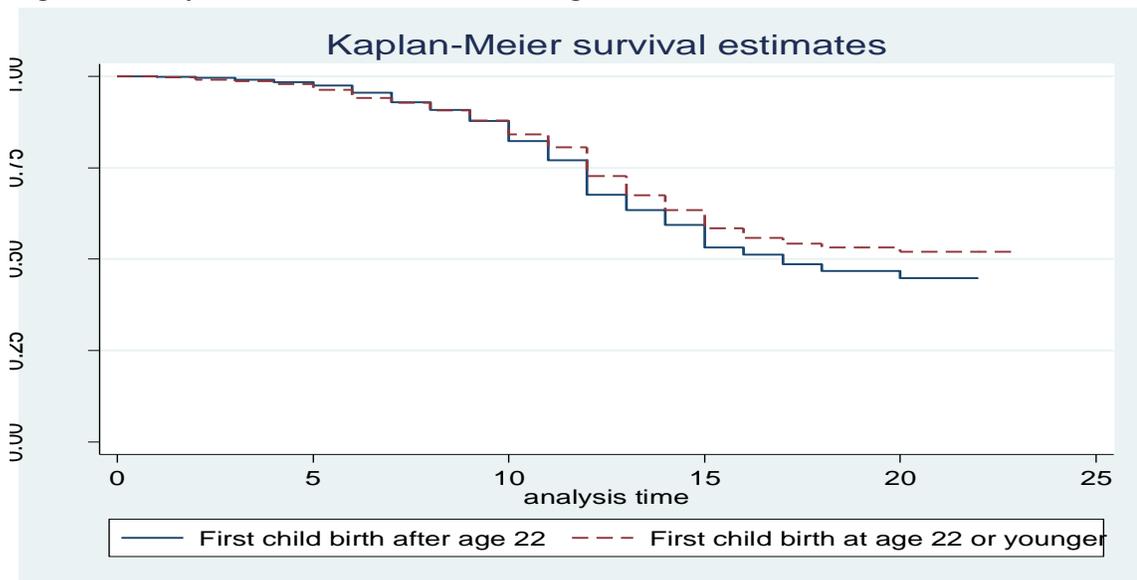
According to Figure 3, mothers who had their first child before age 22 are more likely to stay in the labor force. The log-rank test shows that the difference between the two groups is statistically significant (p= 0.0166).

Figure 4 compares the timing of labor force exit for mothers who had their first child after the age of 30 and mothers who had their first child at or before age 30. There are no major differences between those two groups in the timing of labor force exit. The log-rank test shows that the difference between the two groups is not statistically significant (p= 0.6544).

Figure 4. Late first childbirth and the timing of mother's labor force exit.

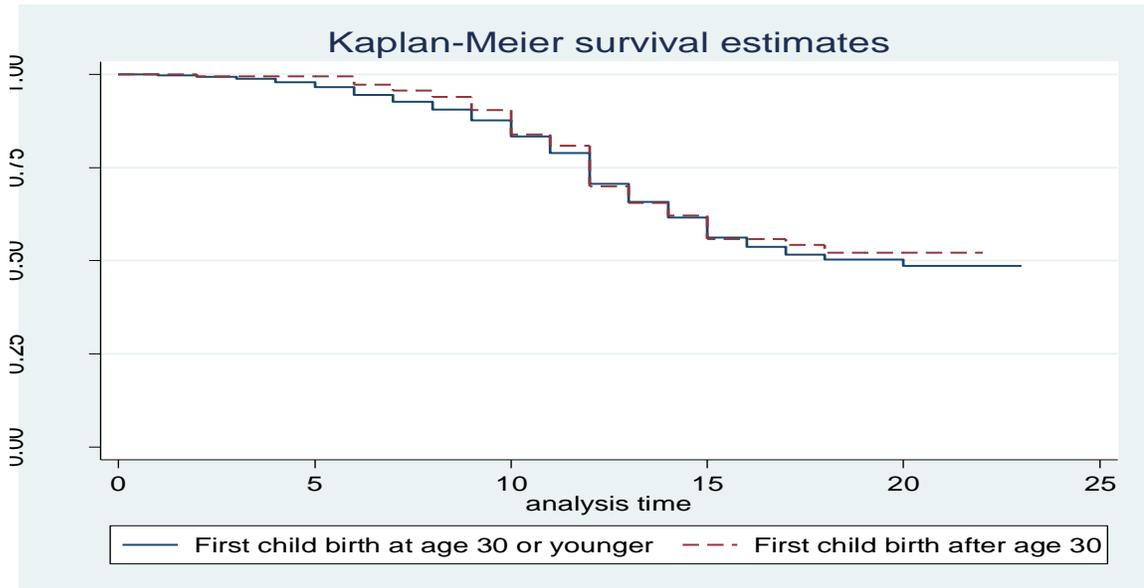Figure 5 compares the estimated duration of participation in the labor force after age 51 for mothers with one child only, mothers of two children, and mothers of three or more children. It shows that mothers who have three or more children are more likely to stay in the labor force longer. However, the log-rank test shows that the differences among the three groups are not statistically significant (p=0.1705).

Figure 5. Number of children and the timing of mother's labor force exit
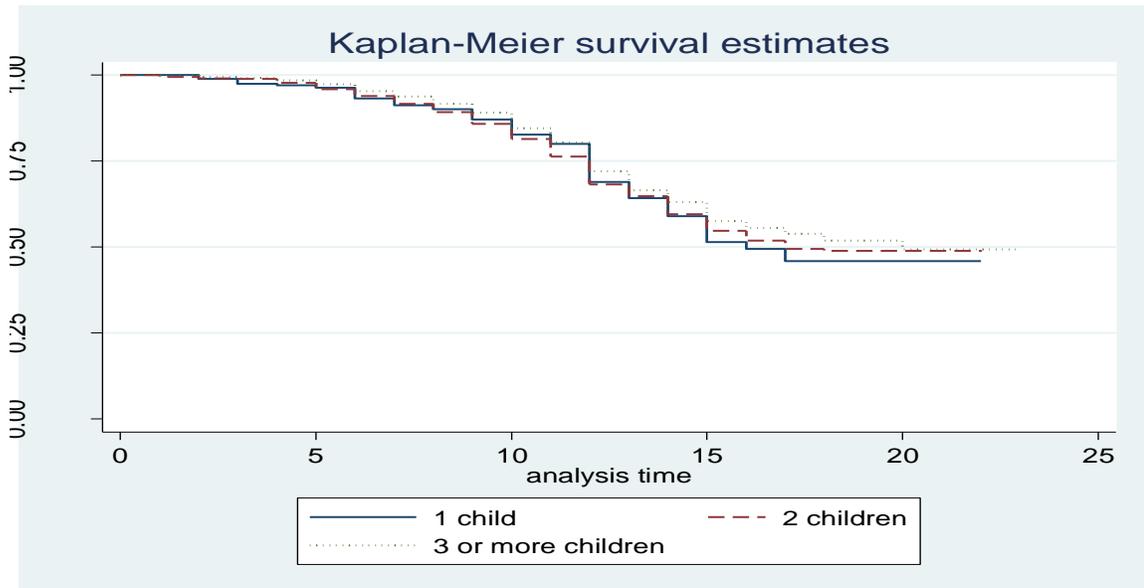

Figure 6 depicts the survival curve of both fathers and childless men. It seems that childless men and fathers do not differ with respect to the timing of labor force exit. Also, the result of the log-rank test is not statistically significant (p= 0.7040). Thus, without controlling for any other factors, fathers and childless men are not different in the timing of labor force exit.

Figure 6. Fatherhood or childlessness and the timing of labor force exit.
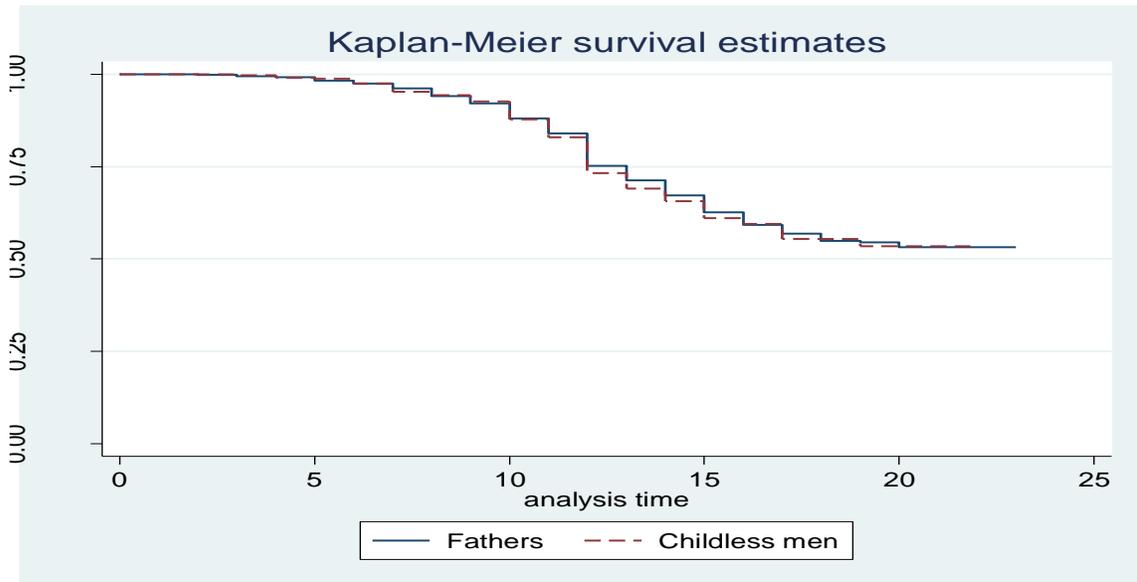
The survival curves of fathers with dependent children and fathers without dependent children are shown in Figure 7. Fathers with dependent children are more likely to stay in the labor force. The log-rank test also shows that the difference between the two groups is statistically significant (p= 0.0005).

Figure 7. Presence of dependent children (under age 18) and the timing of father's labor force exit.
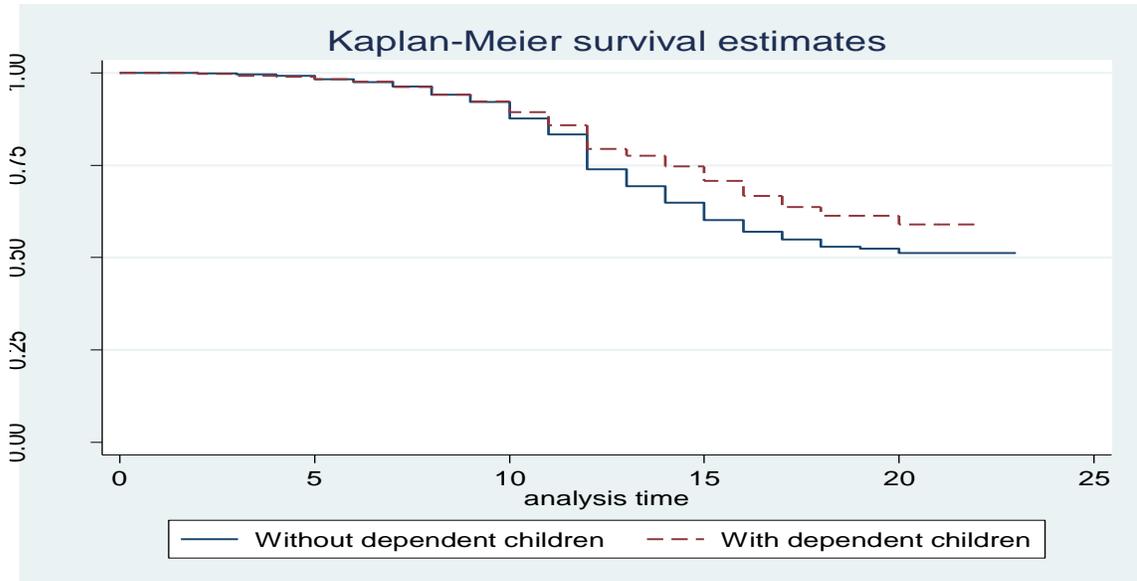
Figures 8 and 9 illustrate how a father's age at first childbirth relates to the number of years he remains in the labor force after age 51. Figure 8 compares the timing of labor force exit for fathers who had their first child before the age of 22 and fathers who had their first child at the age of 22 or after. There are no major differences between these two groups in the timing of labor force exit, and the log-rank test confirms that those differences are not statistically significant (p=0.0876).

Figure 8. Early first childbirth and the timing of father's labor force exit.
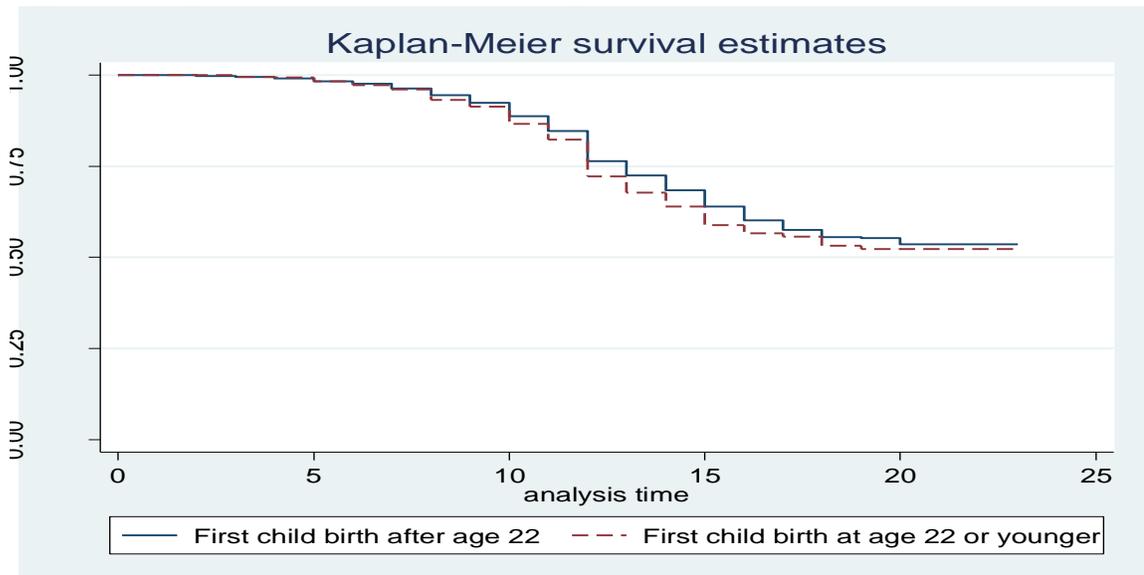
Figure 9 compares the timing of labor force exit for fathers who had their first child after the age of 30 and fathers who had their first child at or before age 30. Fathers who delay their first childbirth until after the age 30 are more likely to stay in the labor force longer. However, the log-rank test also shows that the difference between the two groups is not statistically significant (p= 0.0622).

Figure 9. Late first childbirth and the timing of father's labor force exit.

Kaplan-Meier survival estimates

Legend:
— First child birth at age 30 or younger
--- First child birth after age 30

x-axis: analysis time (0, 5, 10, 15, 20, 25)

Figure 10 compares the estimated duration of participation in the labor force after age 51 for fathers with one child only, fathers of two children, and fathers of three or more children. The log-rank test indicates that the differences among the three groups are not statistically significant (p = 0.8936).

Figure 10. Number of children and the timing of father's labor force exit

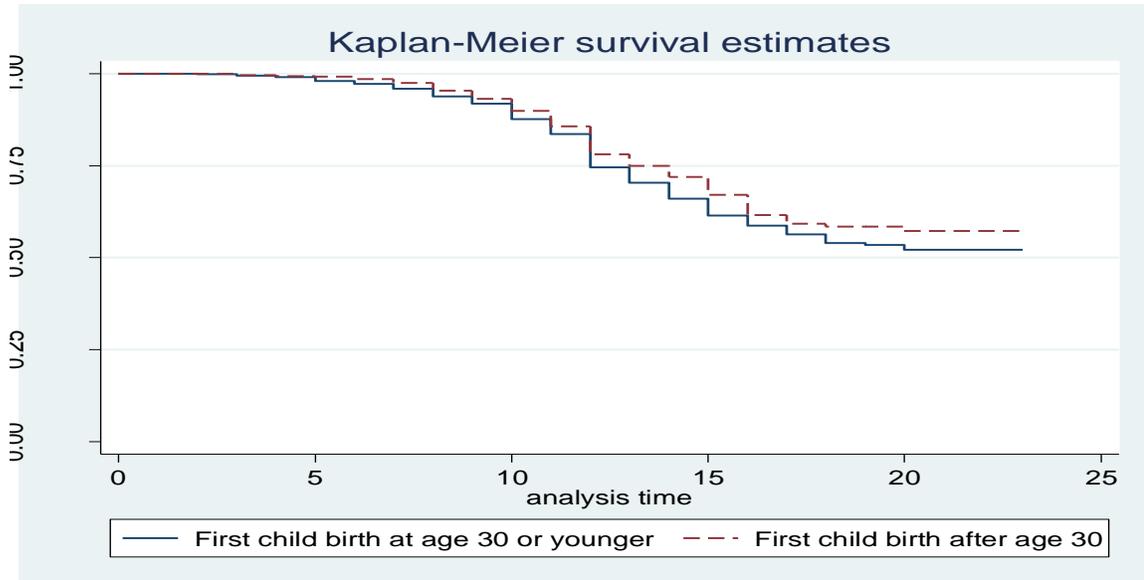Kaplan-Meier survival estimates

(Legend: 1 child, 2 children, 3 children)
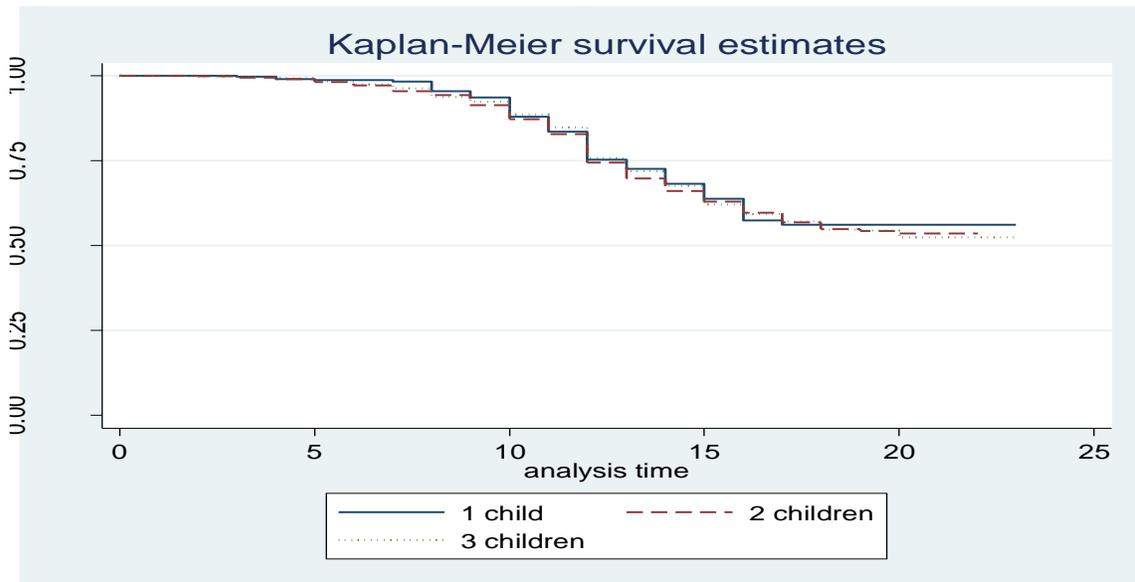
Childbearing patterns and the timing of self-defined retirement

Childbearing factors may have a different impact on the timing of labor force exit and of self-defined retirement. The following analyses examined the effect of childbearing factors on the timing of self-defined retirement. Figure 11 shows the survival curve of both mothers and childless women. It seems that childless women are more likely to define themselves as retired. However, the results of the log-rank test are not statistically significant (p = 0.4788). Thus, without controlling for any other factors, mothers and childless women do not differ in the timing of labor force exit.

Figure 11. Motherhood or childlessness and the timing of self-defined retirement.
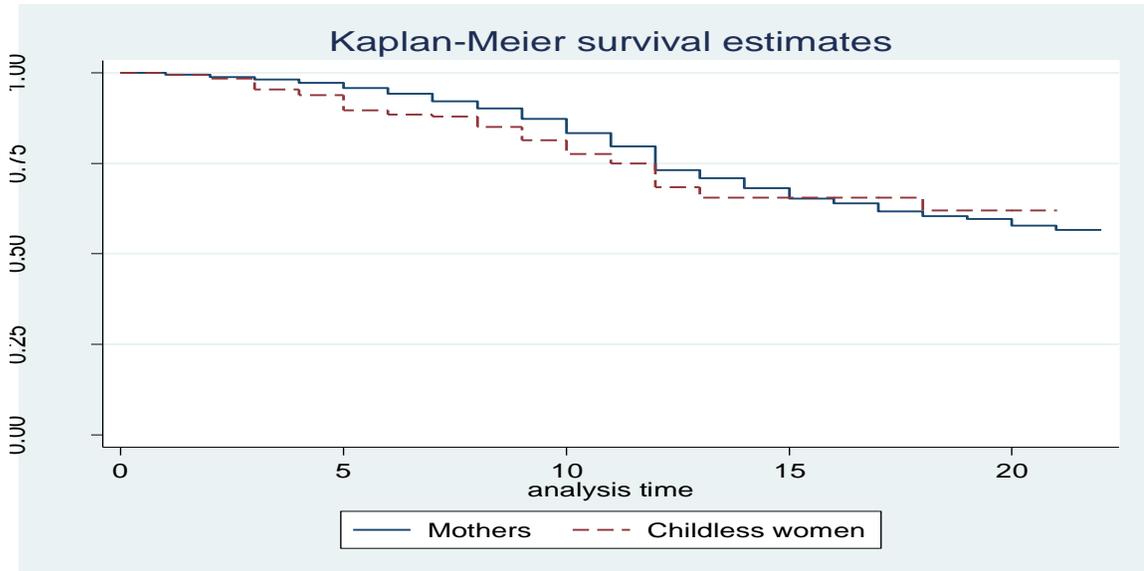
Figure 12 compares the survival curves for mothers with and without dependent children. Mothers with dependent children are less likely to define themselves as retired, but the log-rank test shows that the difference between the two groups is not statistically significant (p= 0.2397).

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Figure 12. Presence of dependent children (under age 18) and the timing of mother's self-defined retirement.
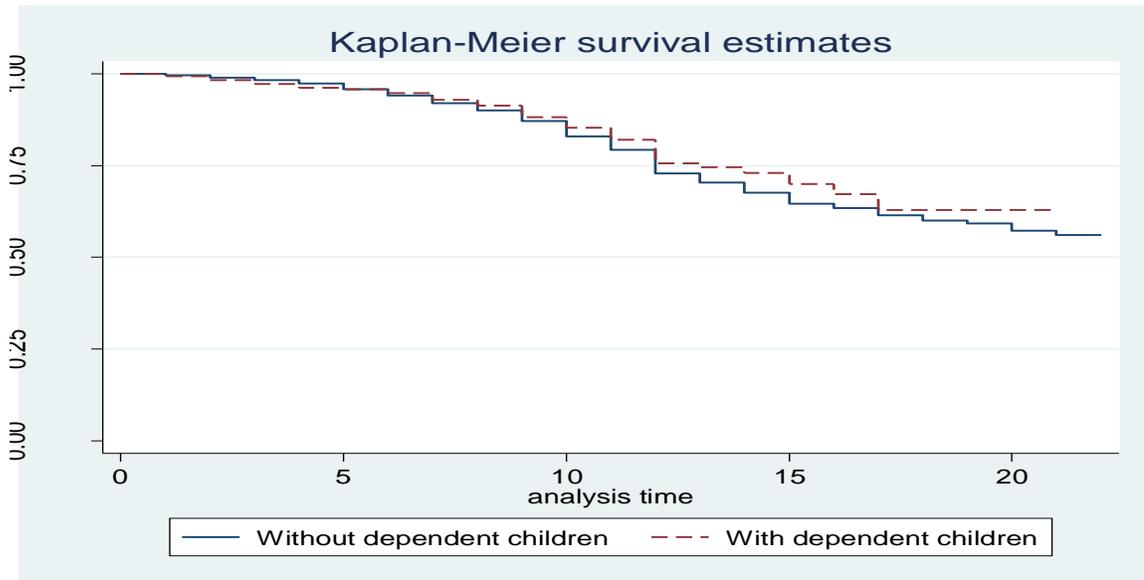
Figures 13 and 14 illustrate how the timing of self-defined retirement varies for mothers who had their first child at different ages. Figure 13 compares the timing of self-defined retirement for mothers who had their first child before the age of 22 and mothers who had their first child at the age of 22 or after.

Figure 13. Early first childbirth and the timing of mother's self-defined retirement.
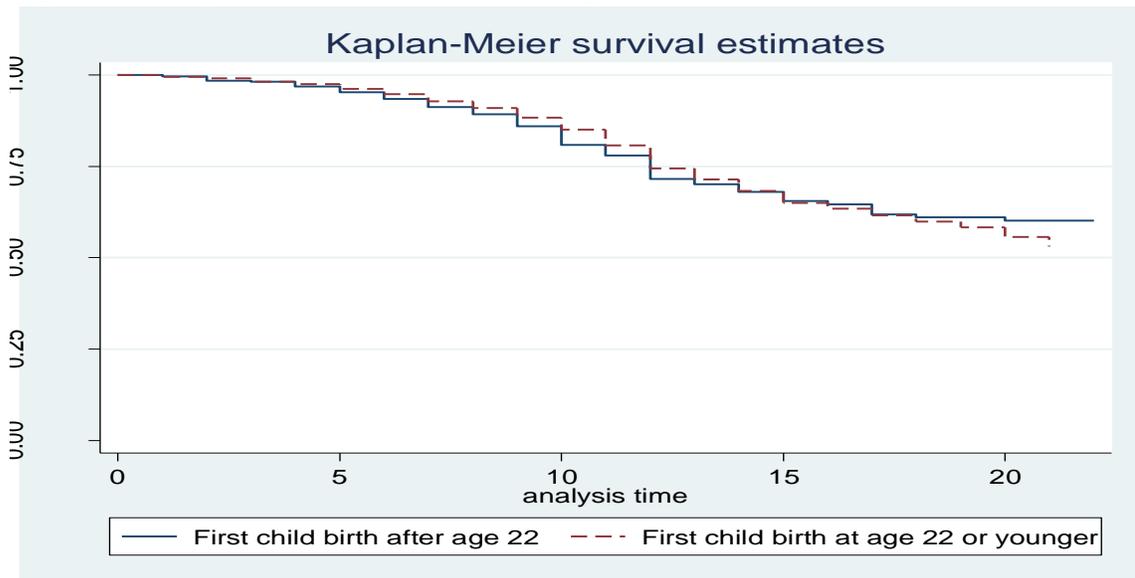
As Figure 13 shows, the timing of self-defined retirement is very similar for the two groups. The results of the log-rank test show that the difference between the two groups is not statistically significant (p= 0.8381).

The timing of self-defined retirement for mothers who had their first child after the age of 30 and mothers who had their first child before age 30 is shown in Figure 14. There are no major differences between these two groups in the timing of self-defined retirement, and the log-rank test indicates that the difference between the two groups is not statistically significant (p= 0.3020).

Figure 14. Late first childbirth and the timing of mother's self-defined retirement.

Figure 15 compares the estimated timing of self-defined retirement for mothers with one child only, mothers of two children, and mothers of three or more children. Mothers of one child are more likely to define themselves as unretired, but the log-rank test shows that the differences among the three groups are not statistically significant (p= 0.5235).

Figure 15. Number of children and the timing of mother's self-defined retirement.
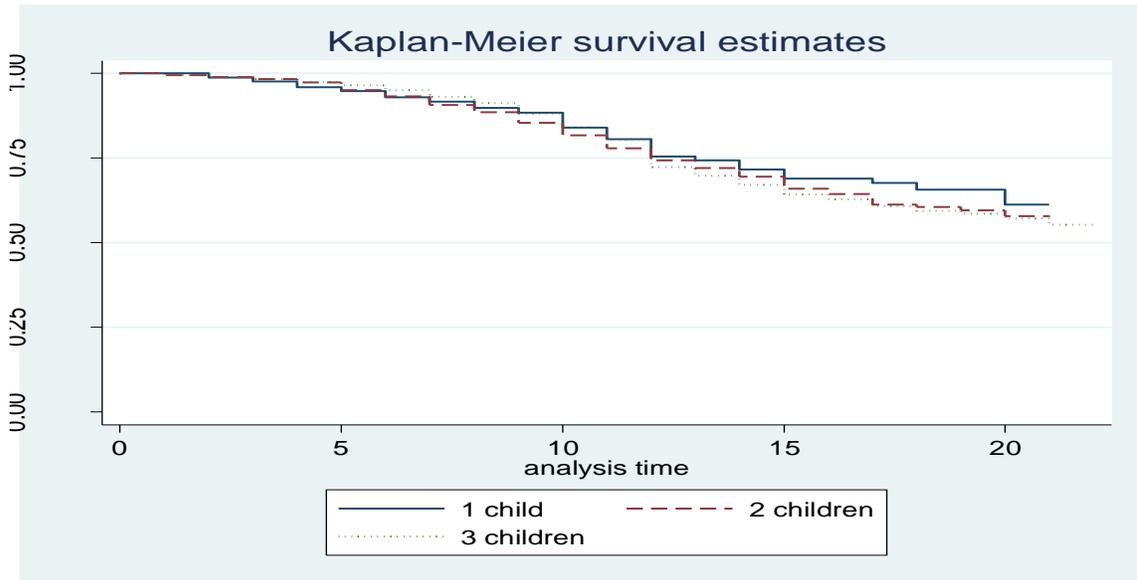
Figure 16 shows the timing of self-defined retirement for both fathers and childless men. It seems that the difference between the two groups is not major, and the results of the log-rank test are not statistically significant (p=0.3704). Thus, without controlling for any other factors, fathers and childless men show no difference in the timing of self-defined retirement.

Figure 16. Fatherhood or childlessness and the timing of self-defined retirement.
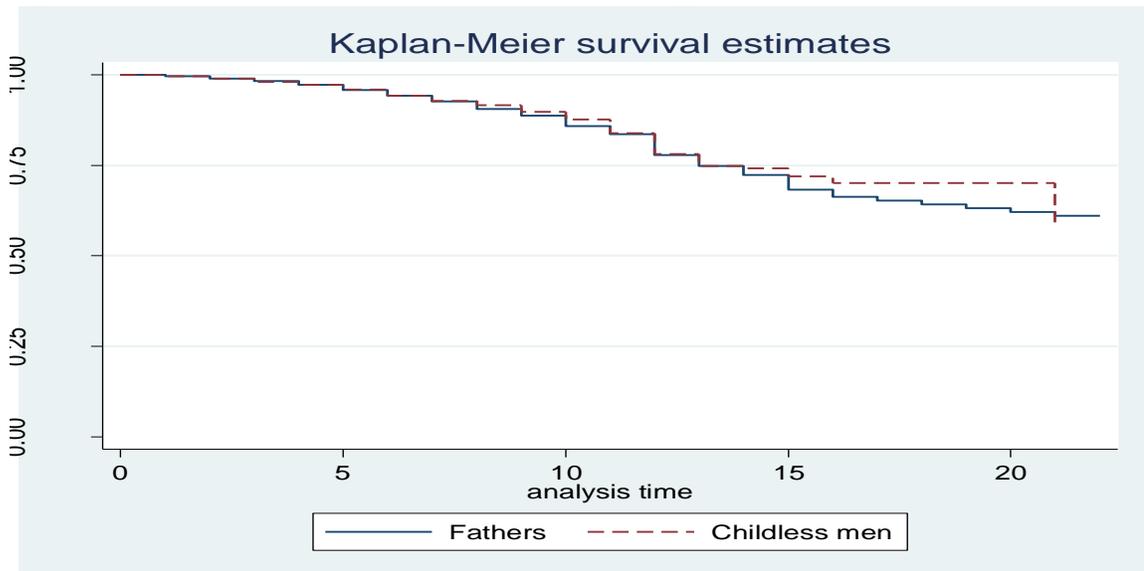
Figure 17 compares the timing of self-defined retirement for fathers with and without dependent children. As the figure shows, fathers with dependent children are more likely to delay the assumption of retirement status. The results of the log-rank test show that the difference between the two groups is statistically significant (p= 0.0001).

Figure 17. Presence of dependent children (under age 18) and the timing of father's self-defined retirement.
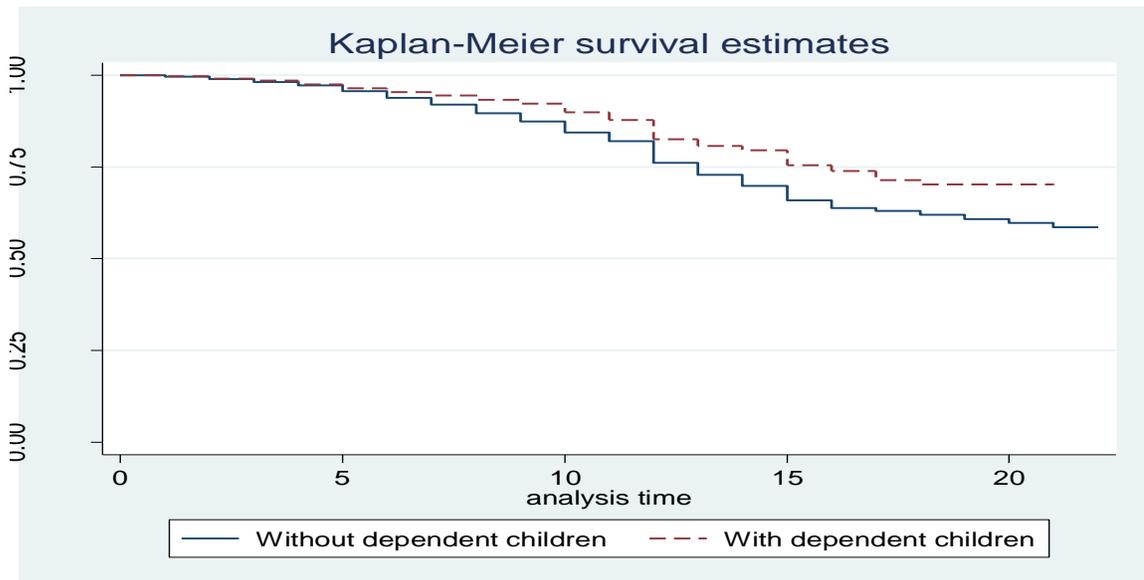
Figures 18 and 19 illustrate the timing of self-defined retirement for fathers who had their first child at different ages. Figure 18 compares the timing of self-defined retirement for fathers who had their first child before the age of 22 and fathers who had their first child at the age of 22 or after.

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Figure 18. Early first childbirth and the timing of father's self-defined retirement.
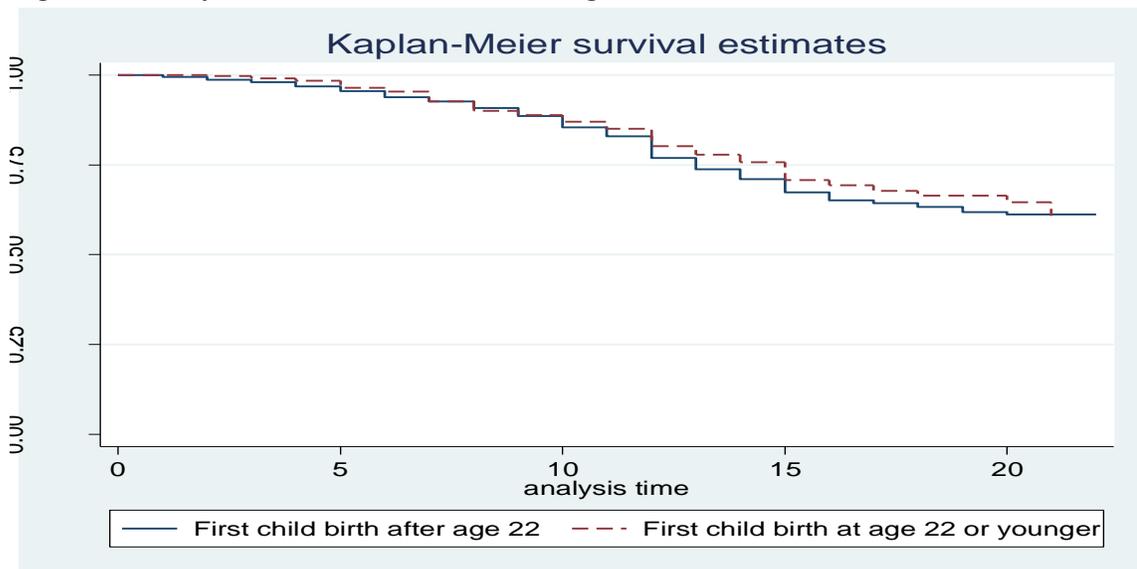
Figure 18 shows that the timing of self-defined retirement is very similar in the

two groups. Likewise, the log-rank test shows that differences between the two groups

are not statistically significant (p= 0.1145).

Figure 19 compares the timing of self-defined retirement for fathers who had their

first child after the age of 30 and fathers who had their first child at age 30 or younger.

There are no major differences between these two groups in the timing of self-defined

retirement, and the log-rank test also shows that the differences between the two groups

are not statistically significant (p= 0.0557).

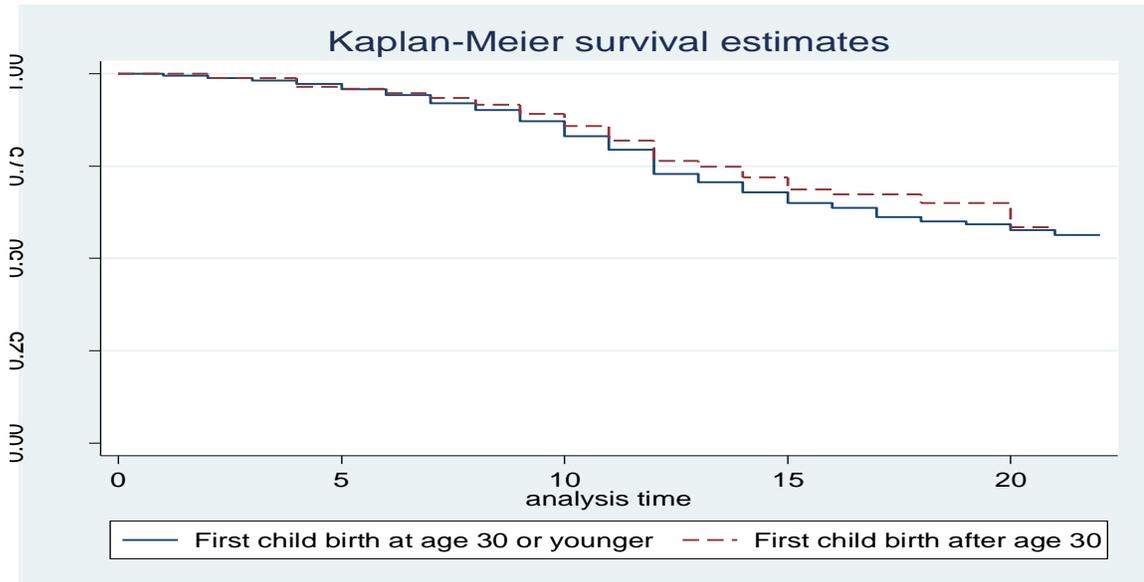Figure 19. Late first childbirth and the timing of father's self-defined retirement.
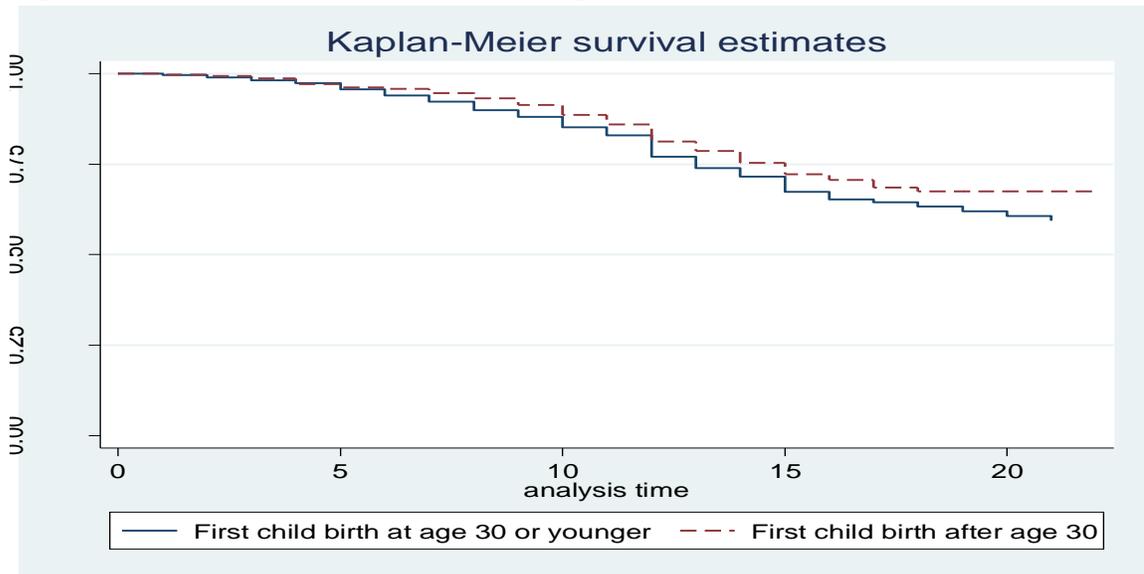
Figure 20 compares the estimated timing of self-defined retirement for fathers with one child only, fathers of two children, and fathers of three or more children. The differences between these three groups of fathers are minor. The log-rank test confirms that the differences between the three groups are not statistically significant (p= 0.0556).

Figure 20. Number of children and the timing of father's self-defined retirement.
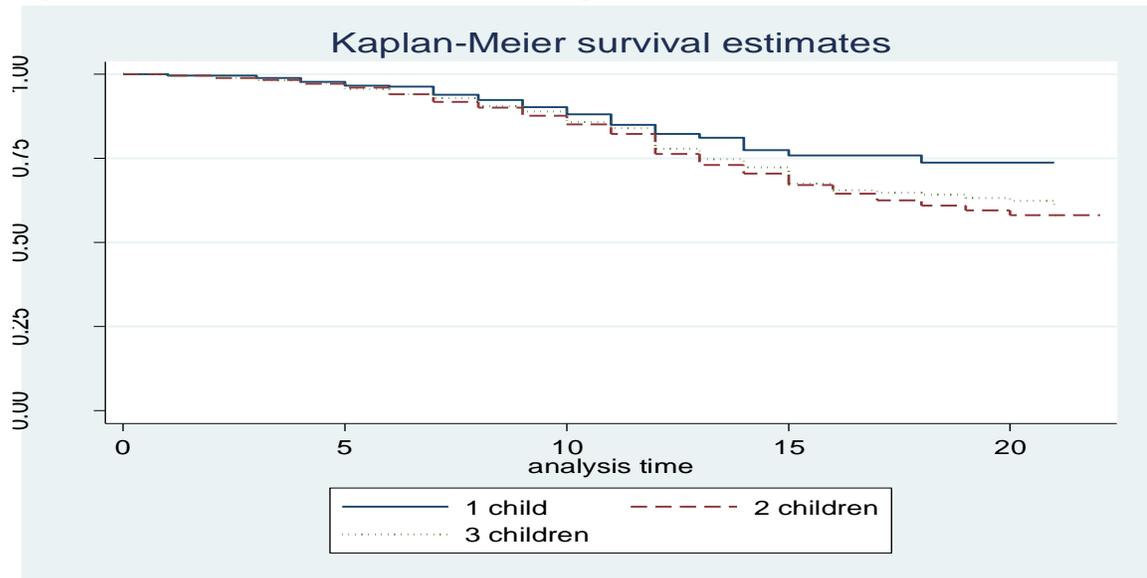
From the above analyses, we can see that before controlling for other factors, childbearing factors seem to affect the timing of labor force exit more than they affect the timing of self-defined retirement. Also, except for the timing of a person's first childbirth, other childbearing factors seem to have similar effects on the timing of labor force exit for both women and men.

Analytical Results-Cox Regression

The following analyses start from exploring the effect of being childless or being parents on the timing of labor force exit with and without controlling for work –related factors. These analyses were followed by breaking down parenthood status to detailed childbearing characteristics with and without the control of work-related factors.

Two different measure of timing of retirement: timing of labor force exit and timing of self-defined as retiree are reported. The separation of the two measurements acknowledges the sensitivity of retirement measurement and reveals the effect of childbearing on different dimensions of retirement.

Also comparing regression results with and without controls for work-related factors reveals whether the differences in the timing of labor force exit or self-defined retirement are due to differences in work characteristics.

Childless status and the timing of labor force exit

Model 1 in Table 2 shows how demographic factors affect women's timing of labor force exit when work-related factors and spousal characteristics are controlled for. For women, it shows that being childless increases the risk of labor force exit. The coefficient for the age variable is negative because the operational definition of my dependent variable is chronological age rather than time elapsed since the study began. This choice of variable takes into account the problem of censored data. A person who was already relatively old when they entered the study would have a greater chance of either retiring at an older age or leaving the study before retiring (i.e., their retirement data would be censored). For example, suppose one person enters the study at age 52

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while another enters at age 58, and both retire at age 70. If both persons participate for 8 years in the study, then the first person would leave the study at the age of 60 while the second person would leave the study at the age of 66. Using the Cox regression model indicated that people who entered the study at a higher age had a higher chance of exiting the labor force later. Surprisingly, the age squared term proved to be statistically insignificant and so it has been omitted from the following analysis. Thus, no curvilinear age effects were detected. Race and ethnicity also have significant effects on the probability that a woman will exit the labor force. Black women have a higher risk of labor force exit compared to White women, while Hispanic women and White women are not significantly different. Women who received some college education are not different from women who received only a high school education or less, while women who received a post-college education are more likely to exit the labor force earlier, compared to those who only received a high school education or less. Compared to women with poor health, women who report excellent health or good health are more likely to postpone labor force exit. Confirming the findings of previous studies, people who have a higher net worth are more likely to stop working at an earlier age. After controlling for personal earnings as proportion of the family income, earnings do not significantly affect the timing of labor force exit, while women whose personal earnings make up a higher proportion of family income are less likely to exit the labor force. The health status of a spouse is not a significant predictor of women's timing of labor force exit. Women who have a working spouse have a lower risk of labor force exit compared to single women, while women who have a nonworking spouse are no different from single women in

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terms of labor force exit. Women who have worked for more years have a higher risk of earlier labor force exit. Pension coverage also positively correlates with the risk of earlier labor force exit. Women who have employer-provided health insurances that cover retirees, who have government insurance, or who are covered by their spouse's insurance have a higher risk of labor force exit. On the other hand, women who have employer-provided health insurance that does not cover retirees have a lower risk of labor force exit. Age discrimination in the workplace is not a significant predictor of women's timing of labor force exit, while women who place a high value on their job exit the labor force later than women who a lower value on their job.

Childless men are more likely to exit the labor force early than fathers. Among men, both Blacks and Hispanics are more likely to postpone labor force exit when compared to their White counterparts. Compared to men who received a high school education or less, men who received at least some college education or who completed college are more likely to exit the labor force earlier. However, men who have a post-college degree do not differ from men who received only a high school education or less. Men who report excellent health or good health are less likely to exit the labor force earlier when compared to men who report poor health. Men's household wealth is not a significant predictor for the timing of labor force exit, while men who earn a higher income and men whose earnings make up a larger proportion of family income are more likely to postpone labor force exit. Also, single men have a higher risk of labor force exit compared to married men, regardless of the married men's spouses' working status or health status. A man's total number of working years does not affect his timing of labor

force exit. Pension coverage increases the risk of earlier labor force exit. Men who have

any type of health insurance coverage have an increased risk of labor force exit compared

to those who have no health insurance. In addition, men who perceive either type of age

discrimination in the workplace are more likely to exit the labor force earlier. Also, men

who place a higher value on their job are more likely to postpone labor force exit.

Table 2. Regression results for childless status and the timing of retirement

	Model 1 labor force exit		Model 2 self-defined retirement	
	N= 105060	N= 122610	N= 103210	N= 102680
Gender	Women Hazard. Ratio	Men Hazard. Ratio	Women Hazard. Ratio	Men Hazard. Ratio
Childless	1.239***	1.0856***	1.345***	1.177***
Age	0.800***	0.797***	0.892***	0.890***
Black	1.084***	0.900***	1.152***	1.052*
Hispanic	1.031	0.905**	0.864***	1.053
Some college education	0.989	1.073**	1.119***	0.901***
Post-college education	1.106***	1.036	0.899***	0.810***
Respondent self-reports excellent health	0.805***	0.915***	0.916***	1.025
Respondent self-reports good health	0.853***	0.931**	0.938**	1.028
Log wealth	3.004***	1.065	3.523***	1.026
Log earnings	1.001	0.992*	1.015***	1.021***
Personal earnings as proportion of the family income	0.697***	0.792***	0.495***	0.464***
Spouse in good health	1.009	0.963*	1.006	1.040*
Spouse in poor health	1.040	0.953*	0.904 ***	0.908***
Spouse working	0.910 ***	0.863***	0.776***	0.790***
Spouse not working	0.975	0.898***	0.980	0.972
Total working years of respondent	1.005***	1.001	1.005***	1.005***
Pension	1.047 *	1.295***	0.945**	0.964*
Health insurance: employee-provided and covers retirees	1.081**	1.210***	1.147***	1.263***
Health insurance: employee-provided and does not cover retirees	0.888***	1.151***	0.925 **	1.098***
Health insurance through government	1.487***	1.323***	1.304***	1.285***
Health insurance through spouse	1.138***	1.184***	1.195***	1.033

Employer favors younger workers for promotion	1.013	1.052**	1.038	1.026***
Coworkers exert pressure to stop working	0.984	1.100***	1.007	1.102***
Respondent values their work	0.986*	0.957***	0.986*	0.963***
LR chi2	3845.24	7457.56	3779.48	2132.79
Prob > chi2	0.00	0.00	0.00	0.00

Note. N= number of observations. *p<.05; **p<.01; ***p<.001.

Childless status and the timing of self-defined retirement

As shown in model 2 in Table 2, the effect of childless status on the timing of self-defined retirement is similar to its effect on labor force exit. Among both women and men, childless people have a higher risk of defining themselves as retired. Among women, Blacks are more likely to take on the retirement identity early when compared to White women, while Hispanic women assume the retirement identity later than White women. Women who have some college education assume the retirement identity earlier than women who have only a high school education or less, while women who have some post-college education take on the retirement identity later than women who have only a high school education or less. Women who have excellent or good health define themselves as retired later than women with poor health. Women who have higher wealth and higher earnings assume the retirement identity earlier, while women whose earnings make up a larger proportion of family income accept retirement status later. Women who have a spouse in good health do not differ from single women in terms of the timing of self-defined retirement, while women who have a spouse in poor health take on the retirement identity later than single women. Women who have a working spouse define themselves as retired later than single women do, while women whose spouse is not working do not differ from single women in the timing of self-defined retirement. Women who have worked for more years assume the retirement identity earlier. Women who have pension coverage identify themselves as retired later. Similar to the effect of health insurance on women's timing of labor force exit, women who have employer-provided health insurance coverage for retirees, or government health insurance, or

insurance coverage through their spouse define themselves as retired earlier. On the other hand, women whose employer provides health insurance that does not extend to retirees define themselves as retired later, when compared to women without health insurance coverage. Age discrimination still does not have a significant effect on women's timing of self-defined retirement, while women who place a higher value on their job assume the retirement identity later.

Among men, Black men have a higher risk of assuming the retirement identity earlier than White men, while Hispanic men do not differ from White men in terms of the timing of self-defined retirement. Men who received more education, whether some college, a college degree, or post-college education, define themselves as retirees later than men who only received a high school education or less. Health status seems to have no significant effect on men's timing of self-defined retirement. Wealth also has no significant effect on men's timing of self-definition as retired. Men who have higher earnings assume the retirement identity earlier, while men whose earnings make up a larger proportion of family income take on the retirement identity later. Men whose spouse is in good health declare themselves retired earlier than single men do, while men who have a spouse in poor health define themselves as retired later than single men. Also, men with a working spouse assume the retirement identity later compared to single men, while men with a nonworking spouse do not differ from single men in terms of the timing of self-defined retirement. Men who have worked for more years assume the retirement identity earlier. Men who have pension coverage identify themselves as retired later. Men who have employee-provided health insurance coverage—whether it extends to retirees

or not—or who have government health insurance all identify themselves as retired earlier than men who have no health insurance coverage. On the other hand, men who have health insurance through their spouse do not differ from men with no health insurance in terms of age at which they declare themselves retired. Age discrimination in the workplace plays a role in men's timing of self-defined retirement. Men who perceive age discrimination from both their employer and their coworkers assume the retirement identity earlier. Men who place a higher value on their job defer identifying themselves as retired.

Mothers' and fathers' labor force exit and childbearing factors

As shown in Table 3, before controlling for work-related factors, mothers who have at least one child under age 18 have a higher risk of earlier labor force exit. The timing of the birth of a woman's first child also predicts the risk of labor force exit. Mothers who have their first child at a younger age (before 22) are more likely to delay labor force exit, while mothers who have their first child at a later age (after 30) are more likely to exit the labor force earlier. Mothers who have more children are less likely to exit the labor force earlier.

Before controlling for work-related factors, fathers who have children less than 18 years old are more likely to exit the labor force earlier, and the number of children does not affect the risk of labor force exit. The timing of the first child seems to play a more important role. Fathers who had their first child early in life have a lower risk of early labor force exit, while fathers who postpone childbirth have a higher risk of stopping working

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Table 3. Regression results of mothers' and fathers' childbearing characteristics and the timing of labor force exit

	Model 1		Model 2	
	N=96972	N=109308	N=96972	N=109308
Gender	Mother Hazard. Ratio	Father Hazard. Ratio	Mother Hazard. Ratio	Father Hazard. Ratio
Having children younger than 18 years old	1.182*	1.007***	1.190***	0.951*
Having the first child before 22 years old	0.708*	0.852***	0.807***	0.905***
Having the first child after 30 years old	1.237*	1.160***	1.168	1.224***
Number of children	0.991**	0.993	0.968***	1.006
Age	0.823**	0.822***	0.791***	0.781***
Black	1.190*	1.003	1.127***	0.921**
Hispanic	0.980*	0.837***	1.032	0.830
Some college education	0.991*	1.025	0.954	1.022
Post-college education	1.115*	0. 984	1.050	0.973
Respondent self-reports excellent health	0.820*	0.894 ***	0.799***	0.890
Respondent self-reports good health	0.880*	0.942**	0.868***	0.909***
Log wealth	1.821	1.027	3.544	1.104
Log earnings	0.919**	0.939***	1.000	0.994
Personal earnings as proportion of family income	0.655*	0.757***	0.724	0.860***
Pension	0.985*	1.333***	1.018	1.316***
Spouse in good health	1.021*	0.938***	1.038	0.943**
Spouse in poor health	0.930*	0.942**	1.051	1.026
Spouse working	0.920*	0.817***	0.927**	0.919**
Spouse not working	1.142*	0.945 **	1.005	0.936*
Total years respondent had worked			0.999	1.000
Health insurance: employee-provided and covers retirees			1.092**	1.154***
Health insurance: employee-provided and does not cover retirees			0.873***	1.110**
Health insurance through			1.473***	1.236***

government				
Health insurance through spouse			1.119***	1.135**
Employer favors younger workers for promotion			0.983	1.085***
Coworkers exert pressure to stop working			0.984	1.117***
Respondent values their work			0.970***	0.947***
LR chi2	4146.61	5751.49	8090.69	7147.18
Prob > chi2	0.00	0.00	0.00	0.00

Note. N= number of observations. *p<.05; **p<.01; ***p<.001.

As shown in Table 3, after controlling for work-related characteristics, mothers with children less than 18 years old are still more likely to exit the labor force earlier. Mothers who had their first children early in life are still more likely to delay the timing of labor force exit. However, postponing the first childbirth until after the age of 30 no longer has a significant effect on a mother's risk of labor force exit. This result indicates that a part of the effect that postponing the first childbirth has on the timing of retirement is in fact due to the fact that women who delay their first childbirth have different work histories and work characteristics compared to mothers who do not delay their first child birth. The research results also showed that a mother who has more children still has a lower risk of earlier labor force exit.

After controlling for work-related factors, fathers who have children younger than 18 are more likely to postpone labor force exit. Fathers who had their first child early in life are more likely to delay labor force exit, while fathers who postpone their first child birth until age 30 have a higher risk of earlier labor force exit. The number of children remains insignificant..

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Mothers' and fathers' self-defined retirement and childbearing factors

Also, as shown in Table 4, before controlling for work-related factors, mothers who have dependent children have a higher risk of defining themselves as retired. Mothers who had their first child early in life (before 22 years old) declare themselves retired later, while mothers who had their first child later in life (after 30 years old) declare themselves retired earlier. The number of children also affects the timing of assuming the retirement identity. Mothers who have more children declare themselves retired earlier.

Before controlling for work-related factors, fathers of children under age 18 defined themselves as retired later. Fathers who had their first child early in life are not different from fathers who had their first children on time (age 22- 30), while fathers who had their first child later in life (after age 30) define themselves as retired earlier. At the same time, the number of children does not have a statistically significant effect on a father's timing of self-defined retirement.

Table 4. Regression results of mothers' and fathers' childbearing characteristics and the timing of self-defined retirement

	Model 1		Model 2	
	N= 87034	N= 98366	N= 87034	N= 98366
Gender	Mother Hazard. Ratio	Father Hazard. Ratio	Mother Hazard. Ratio	Father Hazard. Ratio
Having children younger than 18 years old	1.191**	0.826***	1.016	0.761***
Having the first child before 22 years old	0.649***	0.901	0.770***	0.815**
Having the first child after 30 years old	1.480***	1.469***	1.385***	1.483***
Number of children	1.031**	0.997	0.999	1.016
Age	0.812***	0.828***	0.777***	0.787***
Black	1.432***	0.846**	1.712***	0.778**
Hispanic	1.223***	0.984	1.065	0.774*
Some college education	1.241***	1.047	1.245***	1.071
Post-college education	1.006	0.859***	0.981	0.830**
Respondent self-reports excellent health	0.737***	0.829***	0.708***	0.818**
Respondent self-reports good health	0.759***	0.972	0.622***	0.994
Log wealth	2.123***	1.059*	6.552***	1.055
Log earnings	0.928***	0.946***	1.054***	1.011
Personal earnings as proportion of the family income	0.549***	0.557***	0.461***	0.568***
Pension	1.069**	1.605***	0.881**	1.467***
Spouse in good health	1.052	1.124**	0.982	1.059
Spouse in poor health	1.096*	0.954	1.308***	1.161*
Spouse working	0.875***	0.669***	0.767***	0.904
Spouse not working	1.017	1.022	0.859*	1.295**
Total years respondent had			1.002	0.998

worked				
Health insurance: employee-provided and covers retirees			1.142	1.478***
Health insurance: employee-provided and does not cover retirees			0.835*	1.514***
Health insurance through government			1.947***	1.225*
Health insurance through spouse			0.886	1.439***
Employer favors younger workers for promotion			1.332***	1.276***
Coworkers exert pressure to stop working			0.937	0.959
Respondent values their work			0.883***	0.893***
LR chi2	626.25	1007.28	1144.58	1095.74
Prob > chi2	0.00	0.00	0.00	0.00

Note. N= number of observations. *p<.05; **p<.01; ***p<.001.

As shown in Table 4, for mothers, after controlling for work-related factors, neither having children under 18 nor the number of children has a significant effect on the timing of self-defined retirement. This indicates that a significant amount of the effect that having young children (<18 years old) and the number of children have on the timing of assuming retirement identity could be attributed to work-related factors. However, the timing of the first childbirth still has the same significant effect on the timing of self-defined retirement.

After controlling for work-related factors, fathers who have children under 18 are more likely to take on the retirement identity later. Fathers who had their first child early in life tend to define themselves as retired later while fathers who had their first child later in life are more likely to define themselves as retired earlier. Also, the number of

children still does not affect fathers' timing of taking on the retiree identity. This indicates that work-related factors cannot account for the effects of those childbearing patterns on the timing of self-defined retirement.

CHAPTER 5

DISCUSSION AND CONCLUSION

Discussion

This study evaluated the effect of childbearing factors on the timing of both labor force exit and self-defined retirement. Both childbearing and retirement are important life events; thus, exploring how childbearing experience relates to retirement behavior could help us better understand retirement behavior. There have been many investigations of the effect of some childbearing factors—teen pregnancy or early childbearing, the number of children, and the timing and spacing of births—on women's labor force participation, on job interruptions, and on wages immediately following childbirth, during the childbearing stage, or when the mother is middle aged (Ginn, 1996; Hardy & Shuey, 2000; Pailhe, 2006). A few studies investigated how the number of children affects men's work hours (Backett, 1982; Daniels, 1988; Sanchez, 1997). Other studies examined how childbearing factors, such as a delay of the first childbirth or childless status, affect personal assets in later life (Hofferth, 1984).

While previous studies provided valuable information on the connection between childbearing and labor force participation in earlier life stages, the long-term effect of childbearing factors on retirement choices in later life has received little attention. Even

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in those studies that do address childbearing and retirement, the childbearing factors usually serve as control variables and are not the focus of the investigation. As a result, only a few childbearing variables, such as childlessness or whether children have left home, have been taken into consideration (Choi, 2002; Cooney, 1992; McGarry & Schoeni, 1997; Quinn, 1977; Szinovacz, DeViney, & Davey, 2001). Therefore the effect of other childbearing factors on retirement remains unknown. Furthermore, studies of childbearing effects frequently examine the experience of only one gender, usually women. Thus, we still know very little about how childbearing affects men's labor force participation even at the childbearing stage, not to mention how childbearing factors affect the timing of men's labor force exit and self-defined retirement.

The present study is the first to systematically examine how early childbearing experience affects the timing of retirement in later life. In order to cover different aspects of the childbearing experience, including the timing (when) and intensity (number of children) of the childbearing experience, while at the same time avoiding multicollinearity problems, this study examines how retirement decisions are affected by childlessness, the presence of dependent children (under 18 years old), the age of entering parenthood, and the number of children. A comprehensive investigation of childbearing factors can more effectively demonstrate the effect of the childbearing experience on the timing of retirement.

It is well established in life course theory, which pays significant attention to gender differences, that men and women experience different life course pathways, and that the same life event may have a different impact on men and women. In order to take

into account the possible gender effects of childbearing (Gibson, 1987; Szinovacz & DeViney, 2001), all of the models in this study were run separately for men and women. Another advantage of this study is that it measures retirement both by labor force exit and by self-defined retirement. Although each of those two measurements is commonly used as a proxy of retirement, previous studies have shown that these two measurements do not always provide consistent results and are affected differently by other predictors (Choi, 2002). Thus, it is very likely that childbearing patterns would have a different impact on each of these two dimensions of retirement. To reveal the possible differences, this study measured the timing of retirement through the timing of labor force exit as well as the timing of assuming the retirement identity.

Moreover, the use of data from the HRS makes it possible to control for job characteristics, job benefits, and how long the respondent had worked. Thus, the effect of childbearing factors on the timing of labor force exit, as well as the effect of assuming the retirement identity net of the effect of work-related factors, could be determined. Furthermore, since the HRS is a longitudinal study that allows the use of event history analysis, it is possible to adjust for the effect of censoring (i.e., people who had not yet entered retirement at the end of the study's observation period). This research method is superior to using an ordinary least squares (OLS) regression model; in the OLS model, those subjects lost to attrition are excluded from the analysis, which biases the results to some extent.

This study also pays special attention to the measurement of economic variables, since economic factors play an important role in retirement decisions according to

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neoclassical economic theory. Cost-effectiveness analysis, which compares the opportunity cost of giving up a job (such as the loss of wages) with the utility of giving up the job (such as the increase in leisure time) constitutes the most important part of retirement decision making. Unlike most previous retirement studies, which usually control only for wages and wealth (or assets) as the proxy of the opportunity cost of labor force exit, this study also controls for the percentage of wages relative to household income.

This approach makes it possible to test the hypothesis, originating in neoclassical economic theory, that the opportunity cost of giving up a paid job is determined not only by the absolute monetary value of wages and work-related benefits, but also by the relative value of income from wages when compared to other income sources, such as investment income. In general, the higher the proportion of a person's earnings relative to household income, the less likely it is that the person will give up the job. In addition, controlling for the proportion of wages relative to household income recognizes the importance of the family as an economic unit. People make their economic decisions on the basis of their family's economic attributes, rather than their individual economic attributes. To be more specific, controlling for the importance of wages relative to household income allows for the consideration of non-work income and spouse income, which are also important economic factors in retirement decisions.

In addition to economic factors, this study also pays special attention to the characteristics of a person's job. Aside from the financial incentive of working, the job itself should be considered as a factor that affects retirement decisions. In addition to

commonly controlled work-related variables, this study also controls for age discrimination in the workplace and the extent to which a worker values his/her job.

Overall, this study confirmed the research hypotheses originating from all three theories: life course theory, neoclassical economic theory, and life cycle consumption theory. The results show that many childbearing factors are important predictors of the timing of labor force exit and/or the timing of assuming the retirement identity. Also, each of the three theories has distinct advantages in explaining or predicting different dimensions of how childbearing pattern factors influence the timing of labor force exit and/or the timing of assuming the retirement identity.

The fact that many childbearing factors have a significant effect on the timing of labor force exit and the timing of self-definition as a retiree confirms the hypothesis, based on life course theory, that childbearing, as an important early life experience, can have a significant impact on the timing of subsequent life events (Nock, 1979), such as retirement.

Life course theory also proposes that a single life event can influence many other life spheres, such as the work sphere, the family sphere, and the social sphere. This study shows that childbearing experiences, which belong to the sphere of family life, have important implications for retirement behavior, which belongs to the work sphere. Thus, the study confirmed another aspect of life course theory, which assumes that people's family life spheres and work spheres are interrelated (Han & Moen, 1999).

After controlling for current economic factors such as wages, wealth, the relative importance of wages compared to family income, work-related characteristics, work

benefits, and work history, childless people still have a higher risk of both labor force exit

and self-defined retirement than their counterparts who have raised children. The effect is

so strong that the results do not vary according to differences in the way that retirement is

measured.

On the other hand, the finding that childless people exit the labor force at an

earlier age does not support another assumption of life cycle consumption theory, namely,

that parents see their adult children as substitutes for long-term care insurance. This

finding confirmed Mellor's study (2001), which concluded that even though some parents

do end up receiving support from their adult children, they did not plan on receiving such

support. Their timing of labor force exit is therefore unaffected by the prospect of support

from their children. Thus, the hypothesis that parents would stop working earlier and save

less because they could forego the purchase of long-term care insurance and rely on

child-provided care in old age should be rejected (Mellor, 2002).

In a study of self-defined retirement status and continuing engagement in paid

work among older working-age women, Choi (2002) determined that (1) compared to

mothers who had at least one child staying at home or away at school, childless women

who stopped working are more likely to accept retirement status; and (2) even though

childless women are more likely to define themselves as retired, in terms of their working

status they are no different from mothers whose children have left home. The present

study confirms that (1) childless women are more likely to assume the retirement identity,

but not that (2) childless women are just as likely to stop working as mothers who have at

least one child staying at home or away at school. Contrary to Choi (2002), this study

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found that childless women are in fact more likely to exit the labor force than mothers. The different results may be attributed to two main reasons: First, Choi's study compares childless women and mothers whose children have left home, while this study compares childless women and all mothers. Second, the dependent variable in Choi's study is self-defined retirement status in 1992 and 1994. At that time the population in the HRS was still relatively young, and so the study may not have detected the differences in self-defined retirement among participants at a later age. Also, using a dichotomous retirement variable makes it harder to detect minor differences in timing. Overall, parents have a lower risk both of labor force exit and of taking on the retirement identity when compared to elderly people who are childless. Nevertheless, parenthood can be a very diverse experience. In addition to childless status, many other childbearing factors, such as the number and timing of childbirths, can define different life trajectories and have important impacts on the timing of retirement.

The results of this study confirmed the hypothesis that the presence of dependent children (i.e., children under 18) has an effect on the timing of labor force exit and of assuming the retirement identity for men and women. This also confirms a premise of life course theory, namely that the life of an individual is closely connected to the lives of intimate others (Szinovacz, 1987, 2006).

The fact that the presence of children younger than age 18 decreases a father's risk of labor force exit confirms both life cycle consumption theory and life course theory. Life cycle consumption theory predicts that the expected future expenditure associated with children would motivate parents to stay in the labor force longer to accumulate more

resources, while life course theory predicts that the traditional role of fathers as breadwinners may place a larger financial burden on them and thus motivate them to remain in the labor force in order to support their young children. These findings agree with previous studies which concluded that the presence of young adult children, especially dependent children, could motivate male workers to stay in the labor force longer by imposing a financial burden on them (Cooney, 1992; McGarry & Schoeni, 1997).

The fact that the presence of children younger than age 18 increases a mother's risk of labor force exit confirms life course theory's emphasis on mothers' traditional role as caregivers. It is possible that mothers have less attachment to the labor force when they are raising young children. However, this result conflicts with Choi's study (2002), which concluded that having children living at home or away at school does not affect a mother's participation in the labor force. These contradictory findings may be due to differences in how populations are defined. Choi's study focused on children staying at home or away at school. The children who are away at school are most likely to be college-age children who need financial support rather than their mother's care or supervision. However, the present study treats children under 18 as dependent children, which excludes most of the college-age children. This difference in definition may explain why the present study disagrees with Choi (2002).

This study found that the number of children born to a parent affects women's timing of labor force exit. Having more children decreases the risk of women's labor force exit. The same conclusion was reached by Pienta (1999), who determined that each

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additional child decreases the risk of women's labor force exit in later life. The findings

do not fully support one assumption of life cycle consumption theory, which states that

parents see their adult children as substitutes for long-term care insurance. In that case,

the more children a person has, the more long-term care insurance they would have. Thus,

parents who had more children could retire earlier, because they would not need to save

as much money against future adversity. Again, this assumption was not supported by the

research results. Instead, my findings confirmed Mellor's study (2001), which concluded

that even though some parents do end up receiving support from their adult children, they

did not plan on receiving such support (Mellor, 2002).

According to life course theory, a woman's labor force involvement and work

history is likely to be affected by childbirth. Mothers who have more children may also

have more job interruptions, or may work for fewer hours over a longer period of time.

According to neoclassical economic theory, job interruptions would result in lower

human capital and insufficient career development. Thus, mothers who have more

children may feel the need to stay in the labor force longer in order to make up for

insufficient or delayed career development. In order to eliminate the effect of work-

related factors, many of those factors were controlled in the analysis. However, even after

controlling for earnings, earnings in proportion to family income, assets, age

discrimination in the work place, health insurance and pension coverage, and the total

number of years a person had worked, mothers who had more children were still more

likely to postpone retirement. Thus, it appears that other factors play a role here. Another

possible explanation provided by life course theory is that labor force attachment in early

life may affect labor force participation in later life (Pienta, 1999). However, just like Pienta's study, my study found little support for life course theory's assumption that women who experienced non-normative childbearing patterns (childlessness, delayed timing, and small family size) would maintain a stronger labor force attachment throughout their lives. In fact, this study suggests the opposite: women who experienced non-normative childbearing patterns retire earlier, while women who have more children retire later. This study does not have enough information to test another of Pienta's conclusions, namely that women who are more family-oriented during their childbearing years may have a stronger labor force attachment once family demands have diminished (Pienta, 1999). Thus, our research findings do not eliminate the possibility of that relationship.

Having more children has no effect on the timing of men's labor force exit. Unlike mothers, fathers who have more children are not only less likely than mothers to have a work history interrupted by childbirths, they are also more likely to increase their work hours during the childbearing years (Backett, 1982; Daniels, 1988; Sanchez, 1997). Thus, fathers who have more children do not risk acquiring less human capital and failing to develop their careers. This confirms a hypothesis rooted in life course theory: since fathers' job histories are rarely interrupted by childbirth, the timing of their exit from the labor force exit will not be affected by the number of children.

In addition to the number of children one raises, the age at which one first becomes a parent is a key element of the childbearing experience. This study found that even after controlling for the presence of dependent children, the timing of the first

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childbirth still has a significant influence on both labor force exit and self-defined retirement. The analyses indicate that both men and women who had their first child before age 22 have a lower risk of both labor force exit and self-defined retirement, as compared to their counterparts who had their first child between the ages of 23 and 30. Earlier life course studies indicated that both men and women who become parents early in life may suffer some disadvantage in their level of education, although the effect is more severe for women than for men (Hofferth, Frank, & Mott, 2001). Also, men and women who become parents early are more likely to have low-prestige jobs (Card & Wise, 1978). Thus, in the long run, those parents may try to stay in the labor force longer to make up for insufficient savings. Because assets, income, the total number of years working, and many other job characteristics such as age discrimination and work value variables were controlled in this study, it is unlikely that these factors affect the above conclusions about people who become parents early.

Henretta, O'Rand, & Chan's (1993) study concluded that the timing of women's entry into the labor force has an effect on their timing of retirement. The most reasonable explanation for this is provided by studies (O'Rand & Landerman, 1984; Henretta, O'Rand, & Chan, 1993) indicating that early participation in the labor force coupled with early childbearing predicts late retirement. However, due to limitations in the HRS data, many aspects of women's early work history during their childbearing years could not be controlled. For example, some of those mothers who became workers early may have held a part-time job for many years but still have worked the same number of years as other mothers working full time. Many of them may have held a low-paying job for many

years and have the same level of income now. Some of them may have gone back to school after their children grew up and decided to work longer in order to invest in their own education. Also, I could not control for the amount of pension that respondents could expect to collect during retirement. It is possible that mothers who had their first child at a young age could be covered by a pension plan but entitled to fewer pension benefits, in which case they might choose to delay retirement. The same factors that could lead women who had their first child early in life to delay retirement may also make them reluctant to assume the retirement identity. The HRS data are not sufficient to rule out these possibilities. Once again, the research results indicate that women who decided not to postpone parenthood for career development and therefore had children early are more likely to delay retirement in later life once their family responsibilities decrease. However, the possiblility that mothers who had their first child early in life delay their retirement in order to make up for the disadvantage in career development caused by early childbirth cannot be ruled out (Pienta, 1999).

On the other hand, the study also found that both before and after controlling for job characteristics, fathers who delay parenthood until the age of 30 have a higher risk of exiting the labor force. Earlier studies indicated that fathers who delay the timing of parenthood are more likely to have a higher-prestige job. Thus, fathers who postpone fatherhood may have the opportunity to accumulate more resources and achieve better retirement benefits, allowing them to exit the labor force at a younger age. Even though most of the factors mentioned above were controlled in the analysis (assets, income, pension, health insurance coverage, and age discrimination in the workplace), fathers

who postpone parenthood still retire early when compared to fathers who have their first child on time (age 23–30). But some of the advantages that fathers who delay parenthood may have could not be controlled in the present analytical model. The factors mentioned above that can give a disadvantage to parents who had their first child earlier may also play a role here. Also, delaying childbearing to concentrate on career development may make parents feel like they have spent enough time and energy on work and should spend more time and energy on other dimensions of their life. Fathers who delay the birth of their first child may assume the retirement identity earlier for the same reason.

The study demonstrates that after controlling for work-related factors, mothers who delay childbirth until after the age of 30 and mothers who have their first child between 22 and 30 are no different with respect to the timing of labor force exit. This contradicts an earlier study conducted by Pienta (1999), which concluded that women who postpone their first childbirth until after the age of 30 have a stronger labor force attachment and would maintain that strong labor force attachment in later life and thus delay retirement. The contradiction may derive from a difference in reference groups. In Pienta's study, the reference group is childless women, while in this study the reference group is mothers who had their first child between age 23 and age 30. Earlier, I indicated that childless women are more likely to exit the labor force at an earlier age. Thus, it is quite possible that mothers who had their first children after the age of 30 are more likely to postpone the timing of labor force exit when compared to childless women. Moreover, in this study, the presence of dependent children (under 18 years old) was controlled in the analysis. Thus, the need to stay in the labor force in order to financially support

dependent children could be eliminated as a factor. The analysis shows that women who delay childbirth until the age of 30 are more likely to assume the retirement identity. This may also be due to their more advanced career development.

In addition to the direct measurement of childbearing's effect on the timing of retirement, this study yielded some other general findings. The fact that childbearing factors have a different effect on the timing of retirement before and after controlling for work characteristics, work history, and work benefits indicates that childbearing patterns related to work characteristics and work characteristics themselves have an effect on people's timing of labor force exit and of self-defined retirement. Again, this finding confirms assumptions made by life course theory, namely that life spheres are interrelated and that events early in life have important effects on later life events.

Furthermore, looking at the effect of childbearing factors without considering the effect of work-related factors would produce a misleading conclusion. For example, without controlling for work-related factors, one may wrongly conclude that fathers of dependent children have a higher risk of labor force exit. However, after controlling for work-related factors, fathers of dependent children actually have a lower risk of labor force exit. The results are consistent with neoclassical economic theory and life cycle consumption theory, which posit that the expected future financial demands associated with children may motivate fathers to delay retirement. Moreover, the results also confirm another principle of life course theory, which states that people make important decisions according to their family's life stage. When their children are still young, they

are more likely to opt to stay in the labor force so that they can provide better financial support for their children.

In terms of how control variables affect the timing of labor force exit and the timing of self-defined retirement, the current findings are usually consistent with many previous studies. For example, the results of this study confirmed Ekerdt's finding that age discrimination or a workplace age norm (as when an employer prefers to promote younger workers, or a coworker makes older workers feel that they ought to retire before age 65) motivates older workers to plan an earlier labor force exit (Ekerdt, 1998). Also, this investigation confirms a study conducted by Kosloski and others which found that people who place a higher value on their work or who think work is important for reasons besides money are less likely to plan for retirement (Kosloski, Ekerdt, & DeViney, 2001).

The comparative importance of individual earnings relative to family income is an important predictor of both the timing of labor force exit and the timing of self-defined retirement, even after controlling for both earnings and assets. This finding is consistent with neoclassical economic theory. People whose earnings make up a larger portion of their family income are not only less likely to exit the labor force, choosing instead to stay in the labor force longer to maintain the family's income level, but also less likely to define themselves as retired. After controlling for the importance of earnings relative to family income, assets is still positively correlated with the probability of labor force exit, while earnings do not have a significant effect on the timing of labor force exit. This may imply that the relative importance of earnings in proportion to family income is more important than the amount of earnings itself.

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The fact that childbearing factors have a different effect on the timing of labor force exit and the timing of self-defined retirement indicates that labor force exit and self-defined retirement measure different dimensions of retirement. Thus, future researchers need to be aware of the difference between these two measurements and select the measurement that best suits their investigation.

Conclusion

In sum, this study indicated that childbearing factors—the number of children, the presence of dependent children, and the timing of the first childbirth—are good predictors of people's timing of labor force exit and self-defined retirement. The results confirmed life cycle consumption theory by explaining the effect of childlessness and the presence of dependent children on the timing of labor force exit and self-defined retirement. At the same time the study confirmed life course theory by explaining the effects of childlessness, number of children, and the timing of first childbirth on the timing of labor force exit and self-defined retirement. Usually, childbearing factors that relate to a stronger labor force attachment in early life (childlessness, delaying childbearing, or having fewer children overall) are also related to earlier labor force exit and self-defined retirement, although there are some gender differences. The number of children has a significant effect on women's but not men's timing of labor force exit. It is possible that the number of children is more likely to be associated with the number of job interruptions, which in turn are more a feature of women's experience than of men's. On the other hand, delaying childbearing has a significant effect on men but no significant effect on women, after controlling for work-related factors. It is revealing that

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the reasons why women who delay childbearing are more likely to exit the labor force earlier are explained by work-related factors controlled in this study. However, men who delay childbearing still exit the labor force earlier, after controlling for the presence of dependent children and work-related factors. This result indicates that when the effect of the financial burden imposed by having dependent children is taken into consideration and controlled, fathers who delay their first childbirth are indeed better prepared for retirement. Earlier studies indicated that men who delay childbearing are more likely to have a higher-prestige job. It is possible that other factors associated with a higher-prestige job but not controlled in this study, like the amount of one's pension, lead fathers who delay childbearing to exit the labor force earlier.

Having dependent children (under 18) seems to have a different meaning for men and women. Men's breadwinning role makes them more likely to delay retirement in order to meet the financial demand of supporting dependent children, while women's caregiving role weakens their labor force attachment and makes them more likely to exit the labor force. However, having dependent children has no effect on women's retirement identity.

The findings of this study are relevant to the prediction of future trends in retirement age, and thus have implications for projecting the financial stability of Social Security. Also, the findings contribute to predicting the size of the working population. Previous studies have given a clear picture of the trend of fertility patterns in the United States. More people are childless, and parents are having fewer children (Dye, 2008) and postponing their first childbirth as well as subsequent childbirths (Mathew, 2002).

According to the present study, childless people are more likely to exit the labor force at a younger age. Furthermore, having fewer children affects women's timing of retirement, although it is not relevant to men's timing of retirement. Thus, if the current trend toward having fewer children or no children at all continues, then the average age of people entering retirement will be lowered.

When the timing of childbirth is taken into consideration, the delay in the timing of entering parenthood should also result in an earlier timing of labor force exit. The only offset mechanism comes from parents who have dependent children, because they are more likely to delay the timing of labor force exit. This means that even though delaying the first childbirth is a predictor of early retirement, people who have their last childbirth at a later age are more likely to delay retirement. Thus, the effect of future childbearing patterns on the timing of retirement will depend on the relative strength of these two separate trends.

Even though this study expands our understanding of how childbearing experience relates to the timing of retirement in later life, it still has some significant limitations. First, this study relies on the HRS for its data. While the HRS is a rich source of longitudinal data for studying retirement, the participants include a limited number of minority populations. Thus, this study does not include any populations other than Non-Hispanic White, Non-Hispanic Black, and Hispanic. Therefore the research results should not be generalized to other populations. At present, the number of elders in other minority populations is increasing. Moreover, due to cultural differences or different work trajectories, childbearing patterns may have very different effects on the timing of

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retirement for minority elders. Thus, future studies of retirement decision making should use a data set that includes more minority samples in order to close this gap in our knowledge.

A second important limitation is that the HRS data do not include detailed work histories, so that it is not possible to track job interruptions during the childbearing years. Therefore, this study could not control for job interruptions following childbirths or when children are at a young age. Previous studies have found a relationship between job interruptions early in life and labor force participation in later life. Future studies should strive to include detailed information on earlier job interruptions.

This study defines the timing of labor force exit as the first labor force exit after the age of 51. However, after the initial labor force exit, retirement can be a very complicated process, since retired people can reenter the labor force. In addition to the two measurements of retirement used in this study, the receipt of a pension is another commonly used measurement of retirement. However, in order to simplify this study, other common measurements of retirement were not included in the analysis. Still, childless status and childbearing patterns—especially the timing of childbirths—may have significant effects on reentry into the labor force after retirement, or on the timing of pension receipt. For example, it is possible that some parents may decide to return to the labor force when their children enter college. However, it is also possible that the way that childbearing patterns relate to the timing of retirement is very different from how childbearing pattern factors relate to labor force reentry. Thus, future studies could

expand our knowledge by exploring how childbearing experience affects other measurements of retirement.

The findings presented here prove the connection between early childbearing experience and the timing of labor force exit and self-defined retirement. This connection has important implications for predicting retirement trends and the future size of the labor force. Moreover, it has important implications for policies that are designed to encourage people to delay retirement. Since fertility patterns relate to work history and affect people's timing of retirement, policy makers need to consider trends in fertility patterns when making labor force predictions for the elderly.

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