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THE RETIREMENT LIFE COURSE IN AMERICA AT THE DAWN OF THE TWENTY-FIRST CENTURY*

Running Head: *The Retirement Life Course in America*

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ABSTRACT

The baby boom cohorts began reaching age 62 in 2008, foretelling a rapid swelling of America's retired population, estimates of the population-level implications of older Americans' work and retirement experiences remain limited. How long do people work? How frequently is retirement reversed? How many years do people live in retirement? What is the modal age of retirement? And, how do the experiences of women and men compare? Using the 1992-2004 *Health and Retirement Study*, we estimate multistate working life tables to update information on the age-graded regularities of the retirement life course of men and women in the United States. We find that at age 50 men can expect to spend half of their remaining lives working for pay, while women can expect to spend just one-third. Half of all men and women have left the labor force by ages 63 and 61, respectively. Yet, while most retirement exits are final, considerable variability in the retirement life course remains, as about a third of men's and women's exits are eventually reversed. The demographic regularities of the retirement life course have important implications for proposals designed to deal with the financial pressures population aging places on public and private pension systems.

By mid-twentieth century, retirement remained a relatively uncommon experience (Costa 1998), a transition replete with uncertainties—higher risks of poverty, morbidity and mortality, and vague expectations of disengagement. However, significant increases in Social Security benefit levels, wage-indexing of earnings histories, and the automatic inflation adjustment of benefits, coupled with mandatory retirement ages and the growth of employer-sponsored defined-benefit pension plans, quickly solidified retirement as a clearly-defined normative phase of the life course (Atchley 1982; Guillemard and Rein 1993; Henretta 1992; Wise 2004).

As the twentieth century closed, the institutional uniformity of retirement had weakened as a confluence of factors shifted the risks of old age economic security to individuals, thereby increasing the heterogeneity in the timing and duration of labor force exits. The near universal abolition of mandatory retirement, proliferation of defined-benefit pension plans and one-time early retirement incentives, and secular improvement in financial standing that made retirement more affordable all contributed to this heterogeneity (Costa 1998; Han and Moen 1999; Henretta 1992). This variability led to recognition that for many workers the institutional retirement age of 65 was no longer operative and, although it remains a powerful incentive to retire (Wise 2004), the retirement life course is no longer determined exclusively by the public pension system (Guillemard and Rein 1993). Indeed, a decade into the twenty-first century, for a variety of reasons and in a variety of ways, uncertainty has become a ubiquitous feature of the retirement life course (Blossfeld, Buchholz and Hofäcker 2006; Hardy 2006; Shuey and O'Rand 2004).

While retirement has become less tightly coupled to the institutional schedules of public and private pension schemes—transformed, diversified, reversed, and repeated—it nevertheless remains an almost universally anticipated period of the life course (Costa 1998; Hardy 2002; Henretta 1992). Despite recognition that retirement is becoming increasingly individualized

(Guillemard and Rein 1993; Han and Moen 1999), and a wealth of studies analyzing predictors of individual-level retirement transitions, there has been relatively limited attention (outside of Social Security Administration circles) to documenting the ensuing demographic regularities of older American's work and retirement behavior *at the population-level* (Sullivan 2005).[1] The few prior studies of population-level retirement regularities are limited in their assessments of the timing and length of the retirement life course by relying on net-change indices, such as labor force participation rates, failing to distinguish between alternative pathways out of the labor force, as well as the conspicuous absence of attention to women's retirement life course. Many prior studies are also limited by their use of decades old data on cohorts that worked and retired in a different economic and institutional context. Consequently, our understanding of the retirement life course is outdated and answers to some key questions are not readily available:

- *How many people remain in the labor force at a given age, and how closely are declining rates in participation linked to entitlement ages for Social Security?*
- *How tightly clustered is retirement around Social Security eligibility ages?*
- *Is retirement a single, irreversible event for most workers or do a significant proportion of workers exit and reenter multiple times?*
- *How many years can people expect to work for pay, be work-disabled, and be retired over their lifetimes?*
- *Is the retirement life course similar or different for men and women?*

The goal of this study is to answer these questions and in doing so update information about the demographic regularities that emerge from the complex transition processes that define the contemporary retirement life course. More detailed attention to the implications of the shifting retirement life course is essential given the changes in age structure anticipated with the aging of

[1] The extensive literature on retirement behavior at the individual-level often focuses on a singular aspect of retirement (e.g., retirement exits or "bridge" jobs) or only few of the multiple transitions processes that govern the retirement life course (e.g., Bound et al. 1999; Brown and Warner 2008; Elder and Pavalko 1993; Hatch and Thompson 1992; Quinn and Kozy 1996). What has been largely absent from this body of research is a systematic examination of how these various transition probabilities interact with each other and with mortality to determine the timing, length and complexity of the retirement life course.

the baby boom cohorts and the pressure these changes are placing on both private and public pension systems (Baker and Weisbrot 1999; Hardy 2006; Kingson and Williamson 2001).

PRIOR STUDIES OF THE RETIREMENT LIFE COURSE

The retirement life course refers to the demographic regularities of retirement— that is the average timing of labor force withdrawal and the expectation of life in retirement, defined by the interplay of multiple labor force behaviors and mortality, in the population. The timing and duration of retirement have important implications for the financial demands an aging population will place on public and private old-age security programs. However, we lack nationally representative studies addressing the age-graded regularity and permanence of retirement in combination with mortality patterns (Sullivan 2005).

The few recent population-level studies of retirement have largely relied on labor force participation rates (LFPRs) to document the onset of the retirement life course (e.g., Cieka, Donley and Goldman 1995, 1999-2000). While yielding important information about net changes in labor force attachment, LFPRs provide no information about the actual behavior—the gross movements out of and back into the labor force—responsible for LFPRs. Indeed, stability in LFPRs can belie substantial changes in the underlying exiting and reentry behaviors, as was illustrated for men in the 1970s (Hayward, Crimmins and Wray 1994). The 1980s trend toward earlier ages of initial retirement also corresponded to increasingly common reentry behavior. However, it is unclear the extent to which this pattern of retirement and reentry continues and how prevalent it is in the population and for whom, despite individual-level empirical attention to the concept of ‘bridge’ jobs (Kim and Feldman 2000; Quinn and Kozy 1996).

Studies of LFPRs also do little to gauge the length of life spent in retirement, which requires understanding the mortality experiences of those no longer in the labor force. Despite its utility few studies have actually computed retirement life expectancy. Thus the studies of retirement life expectancy that do exist are based on decades-old data (e.g., Hayward and Grady 1990; Hayward, Grady and McLaughlin 1988b; Kotlikoff and Smith 1983; Lee 2001; Schoen and Woodrow 1980) and are of limited use for describing the end of the work career today given changes in economic organization and advances in total life expectancy. For example, while prior research indicates that increased longevity has not lead to a prolongation of the total work career (Quinn and Burkhauser 1994), the expansion of the non-working years raises the potential for reentry to the work force and multiple exits—a change that prolongs the time period over which retirement may (gradually or intermittently) take place and increases the heterogeneity of retirement (Cahill, Giandrea and Quinn 2005; Elder and Pavalko 1993; Mutchler et al. 1997).

Prior studies of the retirement life course, including some recent estimates, are also limited because they have often assumed monolithic non-participation (Cieka et al. 1995, 1999-2000; Hayward, Grady and McLaughlin 1988a; Lee 2001; Schoen and Woodrow 1980). Yet, there are a number of competing pathways out of the labor force—work-disability being the most prominent (Brown and Warner 2008; Henretta 1992). Indeed, studies of men who exited in the 1970s and 1980s suggest that whether workers exited through retirement or work-disability had profound consequences for remaining life expectancy (Bound, Schoenbaum and Waidmann 1995; Hayward and Grady 1990). The degree to which specific pathways out of the labor force continue to influence the nature and duration of the retirement life course is uncertain.

How similar or different the timing, length, and permanency of the retirement life course is for men and women is also unknown. Prior population-level studies of retirement and working life have largely focused on men (Hayward et al. 1994; Hayward et al. 1988a; Lee 2001; Smith 1982). Although increases in women's education and lifelong labor force attachment have narrowed the gap between men's and women's labor force experiences, the continued gender-segregation of the labor market, greater family-related contingencies in women's work careers (Hsueh and Tienda 1996; Moen and Han 2001), and higher rates of physical disability (Laditka and Laditka 2002), caution against the presumption of gender symmetry in the demographic regularity of the retirement life course. Prior individual-level studies suggest that women face higher retirement risks and lower rates of work-disability than men (Han and Moen 1999; Warner and Hofmeister 2006), which, when combined with their greater life expectancy, suggests that women's retirement life expectancy with be greater than that for men. Nevertheless, because population-level studies of women's retirement experiences have been scarce (but see Hayward, Grady and McLaughlin 1988c), the timing, length, and permanency of women's retirement life course is unclear, especially *vis-à-vis* men's retirement life course.

A MULTISTATE MODEL OF THE RETIREMENT LIFE COURSE

In the present study, we overcome a number of the limitations of prior studies and advance our understanding of the population-level retirement life course using a Markov-based multistate working life approach (Schoen 1988)[2]. Multistate life table models are an elegant method for summarizing *average* lifetime labor force experiences, which result from the complex interplay of exit and reentry processes in combination with mortality. This analytic approach allows us to ascertain, for example, when the bulk of retirement events occur, the prevalence of retirement reversal, and the extent to which reentry prolongs the work career.

We also advance our understanding by using the *Health and Retirement Study* (HRS), the largest nationally representative longitudinal panel of older adults. With these data we were able to estimate working life tables for the population aged 50 to 100. Furthermore, given the large

[2] Multistate life table models have been used to evaluate a variety of complex processes, including voting behavior (Land, Hough and McMillen 1986), marriage and the transition to parenthood (Schoen, Landale and Daniels 2007) and physical disability (Manton, Stallard and Corder 1997), as well as working life.

sample size, we were able to estimate sex-specific working life tables in order to document similarities and differences in the retirement life course of men and women.

The multistate life table model we use summarizes the movement of individuals among three mutually exclusive labor force states—labor force participation, work-disability, and retirement—and the absorbing state death. In this model, individuals may make multiple transitions between labor force activity and the two non-participation states and from all three states to death. Thus, seven possible transitions define the retirement life course based on this state space (see Figure 1). We assume that individuals carry their exit status—retired or work-disabled—forward in time until they experience either reentry or mortality. Consequently, within the multistate life table framework no transitions are permitted between the retirement and work-disability states. We make this restriction because shifts between the work-disability and retirement states likely reflect shifting identities based on social desirability and age-graded social insurance eligibility (e.g., from work-disability to retirement) or in health (e.g., from retirement to work-disability), rather than actual changes in labor force behavior given our reliance on self-reported labor force status, as we describe below. Moreover, there is a low frequency of such transitions in the *HRS* (< 5 % of all transitions) precluding reliable estimation of age-specific transition parameters. To link our findings to published estimates, we also assume that after age 65 individuals can only be observed exiting the labor force via retirement (Hayward and Grady 1990). Programmatically, once individuals reach the full-benefit eligibility age, Social Security does not differentiate between disabled- and retired-worker benefits. Perhaps indicative of this fact, more than 91% of observed work-disability transitions occur before age 65 in our data.

[Insert Figure 1 about here]

Defining the retirement life course in terms of the state space described above enhances our substantive knowledge in important ways. First, we include self-defined work-disability as a distinct non-participation pathway out of the labor force state (Henretta 1992), which allows for the assessment of the extent to which retirement access is curtailed by health-mandated exits. Second, prior research points to the importance of considering the role of health in structuring both the timing and length of the retirement life course of men (Bound et al. 1995; Hayward, Friedman and Chen 1996). Gender differentials in the retirement life course are also likely to be shaped by health, owing to men's and women's different morbidity and mortality experiences. The multistate model above thus allows us to examine these issues by explicitly incorporating work-disability and mortality experiences as defining elements of the retirement life course.

DATA AND METHODS

The *Health and Retirement Study* (HRS) is the largest on-going longitudinal study of older persons' health and labor force activity in the United States. Initiated in 1992 as a study of individuals born between 1931 and 1941, the HRS has moved to a steady state panel design adding new birth cohorts at regular intervals including merging in the companion *Assessment of Health Dynamics among the Oldest Old* (AHEAD) study of those born before 1923 (full details on the study design are available from HRS 2006). The combined panel is nationally representative of non-institutionalized persons over 50 years of age with respondents and their spouses interviewed approximately every two years. For the present analysis, we used cleaned and streamlined RAND (2006) HRS data from the 1992-2004 waves.

Analytic Sample

We constructed a person-interval file containing labor force histories and mortality events by pooling up to seven waves of data from the several birth cohorts interviewed at different ages from 1992 to 2004 to create a synthetic cohort. Labor force transitions were detected by changes in work status across adjacent interviews.[3] We assumed that all transitions between labor force states occurred at the midpoint of the interval and used the date of death for the timing of mortality transitions.[4] Analyzing person-intervals as individual observations does not inflate significance tests (Allison 1995). To increase the density of transitions available, we included both respondents and their age-eligible spouses in our analytic sample. Given our sex-stratified modeling approach (described below), the inclusion of both respondents and their age-eligible spouses does not affect the estimation of standard errors. We applied time-varying individual-level weights to retain the representative quality of the data (for information on sample weights see HRS 2000).

To gauge the representativeness of the HRS for describing the retirement life course of the population over age 50, in preliminary analyses we calculated sex-specific total life expectancies and five-year labor force participation rates. These HRS calculations largely match U.S. Vital Statistic and Current Population Survey estimates.[5] Overall, we are confident in the

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[3] Detecting labor force transitions between interviews on average two years apart does not appear to bias our state-specific life expectancy calculations, although it potentially underestimates the absolute volume of transitions out of and back into the labor force shown in the multistate life tables, particularly if events occur closely together (Wolf and Gill 2009; Wolf et al. 2000). We have no a priori reason to suspect, however, that this observation window fails to detect one transition (e.g., working to retired) any more than another (e.g., retired to working) or differentially captures the movements of men and women. Thus, while the absolute volume of events may be undercounted, the relative volume of events and state-specific expectancies are robust.

[4] The midpoint of the interval is equal to one-half the difference between interview dates for adjacent observations. For mortal transitions, we calculated exposure based on the difference between the recorded death date and the prior interview date. For attrition events, as well as those mortal events where the date of death is unknown, we assigned exposure length to be equal to one-half the average exposure for persons interviewed that wave. We calculated the average person-intervals separately for each *HRS* cohort to account for differences in contact times.

[5] To calculate total life expectancy, we used the parameter estimates from sex-specific hazard models regressing the log-risk of death on age to generate sex-specific single-decrement life tables (Teachman and Hayward 1993). The mortality experiences of men in the HRS largely fall between those in the U.S. Vital Statistics reports for 1990 and 2002 (Arias 2002, 2004). Our parametric estimates of life expectancy for women are slightly higher than those reported in the 2002 U.S. Vital Statistics reports, but these differences are generally less than one year. This discrepancy is not surprising as the HRS sampled the non-institutionalized population and the HRS results are based on a statistical model.

representativeness of the HRS for examining the population-level retirement life course.

We restricted our analytic sample to men less than 90 years of age and women less than 100 years of age to minimize data-sparseness.[6] Our total analytic sample contained 24,273 persons, who contributed 91,933 person-intervals that were an average length of 1.90 years. Women contributed approximately 56% of the total person-intervals.

Measures

Labor force status. At each interview, respondents report whether they are "working for pay now, temporarily laid off, unemployed and looking for work, disabled and unable to work, retired... [or] a homemaker." Respondents are able to identify up to three labor force statuses. RAND (2006) reconciles these self-identified statuses, assigning priority to paid work over other statuses and to retirement over work-disability.[7]

The work behavior of older adults—and retirement in particular—is notoriously difficult to categorize (see Ekerdt and DeViney 1990). Here, we classify behavior in terms of three mutually exclusive self-defined labor force states to link our results with national data-monitoring systems that use LFPRs as well as prior research (see Figure 1). Thus, respondents were *in the labor force* if they were working for pay; temporarily laid off, on sick or other leave; or unemployed and looking for work. Respondents were *work-disabled* if they identified as such

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For both men and women, the observed 5-year labor force participation rates for the *HRS* respondents largely fall between the 1992 and 2004 rates from the Current Population Survey among 50 to 54 year olds. At upper age intervals, the *HRS* estimates are slightly higher than the official statistics by a magnitude of about 3-4% on average. These deviations are also to be expected; the HRS is a longitudinal panel and attrition is greater among the non-working population at older ages, particularly the work-disabled, reducing the number of persons represented in the denominator of the LFPR. A table summarizing these comparisons is available from the first author.

[6] This age-range difference reflects women's greater life expectancy and is important to retain (rather than limiting estimation to women respondents less than age 90 as well) for the accuracy of estimates of the length of the retirement life course for women.

[7] The *RAND HRS* categorizations also make use of follow-up questions about the usual hours per week and weeks per year worked to denote degrees of labor force participation. Although prior individual-level studies suggest a "blurring" of the retirement transition (Cahill et al. 2005; Elder and Pavalko 1993; Guillemard and Rein 1993; Henretta 1992; Mutchler et al. 1997), the extent to which the retirement life course encompasses strategies such as part-time work or non-career bridge jobs, and whether there are gender differences in their usage, was beyond the scope of the current analysis.

or reported that they were retired but had a health condition expected to last at least three months that prevented them from "working altogether" (Burkhauser et al. 2002; Hayward and Grady 1990).[8,9] The remaining respondents were categorized as *retired*.[10] Unfortunately, respondents in the 1993 AHEAD interview were asked only if they were working for pay, precluding the differentiation between non-working statuses, so we assigned these respondents to the retired and work-disabled states using the procedures outlined in Appendix A. Aside from these AHEAD cases, no other respondents were missing on labor force status (RAND 2006). Respondents were identified as deceased based on information provided by proxy respondents or the National Death Index (HRS 2006). We coded respondents one when they changed labor force states between interviews and zero otherwise.[11] Respondents were right-censored if they experienced a

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[8] We made this reclassification for several reasons that reflect our desire to distinguish between labor force exits that are prompted by a significant health concern and those that are motivated by other reasons. First, there is some concern that work-disabled persons may adopt the retiree identity as it is a socially desirable status, especially given that few respondents primarily identified as work-disabled (< 4%). Second. RAND (2006) consistently privileged retirement over work-disability in reconciling multiple labor force statuses potentially obscuring self-defined health mandated exits given that a sizeable minority of respondents classified by RAND as retired also indicated that their health limits the amount or type of paid work they can do altogether. Our categorization here redefines approximately 20% of respondents RAND classified as retired or otherwise out of the labor force to be work-disabled. Defining as work-disabled respondents that express a health limitation that prevents them from working altogether is consistent with prior studies (e.g. Hayward and Grady 1990).

[9] Readers are thus advised that our use of the terms work-disabled and work-disability reflects self-defined health precipitated exits and not principally qualification for any employer- or state-sponsored insurance program.

[10] The retired category includes respondents who explicitly state that they are retired, as well as those otherwise not in the labor force including those who identify as homemakers or some "other" status. As we have no way to identify them in the HRS data, this means that truly "discouraged" workers—those respondents who would like to be working, but have given up looking for a job—are also included with the retired workers, which is consistent with the BLS classification of 'discouraged' workers as 'out' of the labor force. However, in practical terms, the number of such respondents who indicate some "other" labor force status and thus might be discouraged workers is very low. Depending on the interview, about 10-13% of respondents depending on the wave identify as something other than working, unemployed, work-disabled or retired. Almost all of these respondents (>90%) are women who primarily identify as "homemakers." However, prior research indicates that many women are reluctant to identify as "retired" given gendered notions about careers even when they have substantial work histories (Ekerdt and DeViney 1990; Szinovacz and DeViney 1999). We retain these respondents who are not in the labor force but do not identify as retired (or work-disabled) because our purpose is to document the population-level retirement life course and the absence of any restriction on the sample with respect to work history or self-identified labor status allows our results to be directly comparable to estimates from national labor force monitoring agencies.

[11] Given that we pool data from several cohorts interviewed at different ages to create a synthetic cohort and the assumption that the mode of exit status is carried forward, the initial labor force status of respondents was that reported at their first interview irrespective of age, while labor force transitions were detected by changes in work status across adjacent interviews within the restrictions of the multistate life table model discussed above.

competing transition including attrition.

Age parameters. *Age* was a continuous measure of the number of years between the respondent's interview and birth dates. A small number of respondents were missing their birth month and we randomly assigned them June or July (n = 106). We also included additional dummies for *Age62* and *Age65* coded one if they reached this age on or before their next interview to capture the age-eligibility criteria of Social Security, as prior research indicates increased pressure to exit around these ages (Hayward and Grady 1990; Wise 2004).

Methodological Approach

The seven age-specific instantaneous transition rates that governed the moves on the state space of our life table model were defined as:

$$m_{ij}(x) = \lim_{\Delta x \downarrow 0} \frac{p_{ij(x,x+n)}}{n} = m_{ijx}, i \neq j \quad (1)$$

where $m_{ij}(x)$, is the probability of moving from state i to state j between the interval x to $x + n$, given *only* that an individual is in state i at exact age x.[12] The transition rate is constant for individuals within the interval (x , $x+ n$), but may vary across intervals.

We estimated these transition rates separately for men and women using discrete-time hazard models (Allison 1982; Hayward and Grady 1990). These models have the general form:

$$\ln m_{ijx} = \beta_{ij0} + \boldsymbol{\gamma}_{ij1} Age_x \quad (2)$$

where β_{ij0} is a constant for all persons and $\boldsymbol{\gamma}_{ij1} Age_x$ is a vector of time-varying age polynomials

[12] This is the underlying Markovian assumption of the life table model (Schoen 1988)—state duration and prior transition experiences are ignored in calculation of the transition rates. These assumptions are dubious, but they are less problematic for cohort-based multistate life tables because the unmeasured duration and prior transition experiences of the population are reflected in the rates. Greater care in interpretation is necessary with estimates derived from period data or synthetic cohort, as was the case here, as the estimates reflect mobility experiences given the *current* transition rates (Schoen 1988). We address the implications of our period based estimates in the discussion of our findings.

and dummy variables for ages 62 and 65. [13] The specification of age as a continuous measure and the incorporation of higher-order polynomials is analogous to a piecewise constant model with exponential smoothing (Allison 1982, 1995).[14]

For each of the seven transition rates, we tested for age non-linearities in the hazard for men and women by sequentially entering higher-order polynomials and comparing the difference in likelihood ratios between models (Hayward and Grady 1990). All equations included age and the equations for the movement between labor force states also included dummy variables for age 62 and age 65 (the latter in retirement models only) irrespective of their statistical significance. The highest-order polynomial required to define the transition rates was age to the fifth power, though most transitions required at most an age-squared term.

The parameter estimates were used to calculate age-specific transition rates. These rates were the inputs for calculating population-based multistate life tables, which represent the experience of all persons conditional on having survived to a given age, *irrespective* of the state from which they originated.[15] Thus, the life tables described the *average* labor force experiences in the population. To estimate the experiences of the synthetic cohort, we initiated the life tables for men and women with a radix of 100,000 persons allocated across the three living states (in the labor force, work-disabled and retired) at age 50, according to the observed prevalence of

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[13] In preliminary analyses, we estimated a single model to verify gender non-proportionalities in *Age* for each of the transition rates by adding a term for *Female* and the necessary *Female* x *Age* interactions to define the hazard and compared the difference in the log likelihood ratios between the base and saturated models. We found substantial evidence of sex non-proportionality in four of the seven transitions and concluded that sex-stratified models were indeed warranted.

[14] In preliminary analyses, we estimated each hazard rate using a piecewise constant (i.e., nonparametric) model with two-year categorical age parameters and plotted the results to verify the functional form of each of the transitions observed in our data. These estimates closely conformed to those presented here (not shown).

[15] This is in contrast to *status*-based multistate life tables, which consider origin dependence in the distribution of remaining life. We calculated population-based multistate life tables to determine the overall patterning of labor force experiences and whether men and women face differing constellations of remaining life in the labor force, work-disabled, and retired.

persons ages 50 to 54.[16] We then used the age-specific transition rates for ages 50 to 100 to calculate the life tables using the linear method outlined in Schoen (1988) using a SAS® Macro written at the Penn State Population Research Institute.

The multistate life tables provide a set of important measures that can be used to summarize the retirement life course. We present four of these measures; calculation details can be found in related texts (see Hayward and Grady 1990; Land, Yang and Yi 2005; Schoen 1988). The first measure is the well-known survivor function (l_{ix}), which allows us to document how many persons in the life table cohort can expect to be in each state *i* at a given age *x*. We divided the survivor function by the radix population in order to express the number of survivors as a proportion (i.e., l_{ix}/l_{50}). The survivor function for each state is produced by flows out of and into each state, and thus age-related changes in l_{ix} reflect net changes in labor force composition.

The flows are indicated by the decrement function (d_{ix}), and summarize the mobility experiences of the life table cohort in terms of the expected number of work-disability and retirement events, the number of reentry events from work-disability and retirement, and the number of death events in each state. Because the absolute number of decrements is arbitrary depending on the size of the radix population (Land et al. 2005), we divided the cumulative number of decrements experienced by the number of persons alive at the beginning of the interval (i.e., $\sum d_x/l_{ix}$). This allows us to characterize these mobility experiences in terms of the average number of labor force accessions and separations a person alive at a given age will *ever* experience. Comparisons between men and women permit us to document gender similarities or differences in the probabilities of retirement and work-disability, as well as in the tendency to reverse these transitions through reentry to the labor force. We also graphically display the age-

[16] We calculated the prevalence rate by pooling persons ages 50 to 54 to ensure an adequate number of cases in each origin state. We also calculated prevalence rates using persons ages 50 to 53 and 50 to 55 to test the sensitivity our results. The multistate life table expectancies were relatively invariant to these alternate radix allocations.

specific volume of transitions for a standard cohort to document the distribution of events surrounding important ages such as 62 and 65, assessing the remaining influence of institutional timetables on the retirement life course.

The third measure is state-specific life expectancy (e_{ix}), which partitions total life expectancy at a given age across each of the labor force states—in the labor force, work-disabled and retired. This lets us gauge the number of years the average person in the population can expect to spend in each state and thus how many years the average person will be out of the labor force—the length of time over which they must allocate personal savings and draw on public and private pension programs. Furthermore, given that the state expectancies sum to the overall life expectancy, we can evaluate not only absolute gender differences in state-specific life expectancies but also what proportion of remaining life will be spent in each labor force state, thus adjusting for the well-know sex disparity in mortality.

Finally, we present the implied age-specific prevalence rates for those in the labor force: the labor force participation rate (LFPR). The LFPR gauges the labor force attachment of surviving members of the life table cohort. We also present the ages when three-quarters and one-quarter of surviving cohort members remain in the labor force. The length of time it takes the cohort to move from a 75% to 25% LFPR—the Interquartile Range (IQR)—is a key measure of population level variability in the retirement life course (Henretta 1992).

FINDINGS

What does the population-level retirement life course look like for older men and women? How are the demographic regularities of men and women similar? How are they different? We begin with an overview of the observed transitions in the *HRS*. We then discuss how age is associated with the labor force transition rates defining our multistate working life table model. Finally, we examine the implication of these transition rates for the retirement life course of older Americans as indicated by the multistate life table results.

Descriptive Results

Table 1 presents the percent of person-intervals in each origin state and their distribution across the destinations states by gender. We also include information on attrition events. These percentages represent the crude transition rates. From the basic distribution of events, there are clear gender differences in later-life labor force transitions shown in the off-diagonals.

[Insert Table 1 about here]

We observe the expected variation in the origin states of men and women. Half of all person-intervals for men originate in the labor force compared to fewer than 35% of the intervals for women. Women are more likely than are men to be retired and slightly more likely to be work-disabled. Correspondingly, women have higher exit rates to retirement (17.92% versus 15.06%, respectively) and slightly higher rates to work-disability. Interestingly, women also have lower crude reentry rates than men from both of these states. The sex-gradient in the risks of death are as expected: men are more likely to die than women in each origin state.

Hazard Model Results

The hazard model results demonstrate that the transitions which define the retirement life course are highly variable and differ in important ways for men and women. Because it is difficult to compare parameter estimates across models given differences in the functional forms, we rely on graphical presentations to illustrate gender similarities and differences in the forces defining the retirement life course. As the mortality risks across the living states are as expected, we do not present them in the text. Interested readers can find tables of the hazard model estimates for men and women in Appendix B (Tables B1 and B2, respectively).

Men. As shown in Figure 2, the risk of exiting the labor force via work-disability is initially quite low, especially relative to the alternative pathway of retirement, and it declines with age. Early-eligibility at age 62 does not significantly affect the risk of exiting via work-disability for men. Recall that our multistate life table model defined this transition to be impossible after age 65 to reflect the Social Security guidelines. In contrast, men's risk of retirement fluctuates considerably with age. The risk increases through the mid-60s and levels out though the late-70s before a dramatic rise and then a precipitous decline to almost zero at the oldest ages. Not surprisingly, we see significant spikes in the risk at the Social Security eligibility ages with the increase most dramatic at early-eligibility: at age 62 the risk of retirement is about 1.63 times greater than would otherwise be expected at that age [$e^{(0.4887)}$=1.63], while at age 65 the risk is about 1.24 times greater [$e^{(0.2187)}$=1.24] (see Appendix Table B1). We caution the reader not to make much of the high risks of retirement beyond the 70s; as we show below, few men remain in the labor force at these ages so the relative impact of this high risk is quite small.

Among non-participants, the risk of reentry to the labor force is consistent with the crude rates presented above (See Figure 3). For work-disabled men, the risk is low at age 50 and declines with age. We find no evidence that the Social Security early-eligibility age has a significant influence on reentry rates from work-disability. In contrast, retired men face a substantial risk of reentry to the labor force in their early 50s, slightly more than three times that for reentry from work-disability. However, the risk of reentry from retirement also declines quickly with age and is effectively zero by about age 70. Again, there appears to be no systematic connection between Social Security eligibility ages and the risk of reentry for men.

[Insert Figures 2 and 3 about Here]

Women. The risk of work-disability for women is generally low, although non-linear. This risk increases marginally until about age 57 and then declines (See Figure 2). However, there is some evidence that the benefit structure of Social Security temporarily lowers the risk of work-disability at age 62 by about 85% more than expected from the overall age trend.

The pattern of women's age-specific retirement risks differs somewhat from that shown for men, as indicated by the absence of multiple peaks and troughs. Like men, women's retirement risks clearly begin to rise in the 50s, spike at age 62 and again at age 65. However, the pressure for women to retire appears greater than that for men at age 65: men respond more to the early age eligibility criteria, while women appear to be equally responsive to both age criteria—the risk of retirement for women is 1.57 times higher at age 62 [$e^{(0.4636)}=1.57$] and 1.55 times higher at age 65 [$e^{(0.4366)}=1.55$] than otherwise expected (see Appendix Table B2). Although the risk of retirement remains relatively high for women until very advanced ages, we again caution against over interpretation because few such women remain in the labor force.

Older women face relatively low risks of reentry to the labor force irrespective of their exit mode (See Figure 3). For reentry from work-disability, the risk is low at age 50 and quickly declines thereafter so that by age 65 it is effectively zero. Women's risk of reentry from retirement is substantially higher than the risk of reentry from work-disability—about two and a half times so at age 50—similar to men. Still, at age 50 retired women face just a 15% risk of reentry.

How do the schedules of risks for women compare to those for men overall? In general, women face a higher risk of retirement than do men but men face higher work-disability and mortality risks than women. Men also experience higher risks of reentry from retirement, while the risk of reentry from work-disability is largely similar. Again, while we see evidence that for men and women early-eligibility for Social Security at age 62 influences the risk of retirement, women are more responsive to the age 65 full-eligibility threshold than are men.

Multistate Life Table Results

Our multistate life table model results illustrate how the schedule of transition risks described above differentiate the demographic regularity of the retirement life course in major ways for men and women. We present three measures from the working life tables at selected ages together in order to summarize the retirement life course—survivorship, the volume of labor force accessions and separations, and total and state-specific life expectancies. [17] We separately present the implied labor force participation rates (LFPRs) and associated summary indicators to contextualize the labor force attachment of the life table cohort.[18] The results are displayed in Tables 2 and 3 for men and Tables 4 and 5 for women.

Men. About 89% of men age 50 are in the labor force, 6% are work-disabled and 5% are retired by our classifications (see Column 1, Table 2). By age 60—two years before early-eligibility for Social Security—8% of the life table cohort has died, the percent in the labor force has already dropped to 66%, and the proportion retired rose from 5% to 18%. By age 62, 11% have died and only 58% of the cohort alive at age 50 is in the labor force; this percentage drops rapidly to 42% by age 65. More than half of all men alive at age 50 have left the labor force by age 63, two years before the institutional "normal" retirement age (not shown).

[Insert Table 2 about here]

As is evident in the results showcasing the volume of events (see Column 2, Table 2), men alive at age 50 are highly mobile. At age 50, most men can expect to retire at least once

[17] Complete multistate life tables are available from the first author upon request.

[18] Although not directly comparable, the single-year implied LFPRs presented in Tables 3 and 5 for men and women, respectively, are consistent with the five-year LFPRs from the Current Population Survey (not shown).

(1.01) but can expect just 0.06 work-disability exits. 16% of men alive at age 50 will die in the labor force. Retirement is by far the most common event accounting for 89% of men's exits.

Comparing the volume of transitions in the life table cohort alongside the transition probabilities at each age confirms that most retirement events occur before age 65 (see Figure 4). While the absolute transition rates at age 62 and age 65 are similar, their relative impact on the number of events is not. For men, sixty-two is the modal age of retirement—not age 65. Moreover, as is evident in Figure 4, more than one-third (35%) of all retirements occur prior to age 62, at least partially reflecting the availability of private employer-sponsored pensions and other forms of wealth (such as individual retirement savings that are accessible without penalty after age 59½). While retirement before age 62 is often "early" with respect to benefit eligibility, retirement before achieving full-benefits is early retirement under the Social Security framework; approximately 54% of men's retirement events occur prior to reaching this institutional benchmark at age 65. However, it is also evident that a substantial amount of retirement is "late," as approximately 41% of retirement events occur after age 65. It is perhaps most striking to consider that almost 76% of men's retirement events occur outside of the Social Security eligibility window either before age 62 or after age 65.

[Insert Figure 4 about here]

The relatively high expectation of retirement, given the number of competing events, also reflects the fact that a sizeable number of men reenter the labor force after exiting. Roughly 29% of all retirement events among men are eventually reversed [0.29 / 1.01 = 0.29], as are two-thirds of work-disability exits. Not surprisingly, reentry among retired men is more likely at younger ages. About 42% of all retirements by age 60 are eventually reversed [(0.29-0.21) / (1.01-0.82) = 0.42], compared to 37% of retirements by age 62 and 31% by age 65. Yet, men continue to reenter the labor force even at older ages. More than a quarter of retirement events at or after age 65 are eventually reversed [(0.15 / 0.56) = 0.27].

To get a handle on the role of reentry in shaping men's retirement life course, we calculated a multistate life table assuming there was no reentry, restricting the risk of reentry from both retirement and work-disability to be zero (results not shown). This allows us to simulate, albeit in a crude manner, how different men's experiences would be if all exits were final (assuming independence of the events). Our simulation shows that the average age at retirement for men would decline from 65.1 to 62.8 years, a difference of about two years and four months.[19] It is important to emphasize that, despite the volume of reentries, our multistate life table results indicate that most retirements are *not* reversed; the majority of men exit the labor force once and they do so well-before the age of full-eligibility for Social Security. Nonetheless, it is evident that reentry delays labor force withdrawal for a few years and thus is an important facet of men's retirement life course.

The combined impact of the exit, reentry and mortality forces on men's retirement life course is most apparent when we consider the state-specific life expectancy estimates presented in the final column of Table 2. Overall, men at age 50 can expect to spend on average about 13.78 years—or one-half of their remaining years (51%)—in the labor force. Most of the non-working years are spent in retirement. The average man can expect to spend about 41% of his remaining life retired (11.06 years), with the remainder work-disabled (8% or 2.27 years). Not surprisingly, both the absolute level and proportion of expected life spent in the labor force decline with age. What may be more surprising, though, is the length of expected working life at ages 62 and 65 (5.25 and 3.85 years respectively). Despite pressures to retire at (and even before)

[19] The mean age of transfer between states *i* and *j* can be calculated using the formula outlined by Schoen (1988:95): $\overline{\text{Age}}_{ij} = \sum\left[\left(x + \tfrac{1}{2}n\right)d_{ij}\right]/\sum d_{ij}$, where the age interval is defined as (x, n).

the institutional retirement ages, the expected length of working life at older ages suggests a relatively strong labor force attachment.

[Insert Table 3 about here]

Indeed, the labor force participation rates (LFPRs) implied by our working life tables demonstrate considerable attachment to paid work even in the late 60s (see Table 3). Looking at the Social Security eligibility ages (for the cohorts studied here), more that 60% of men alive at age 62 and a little less than half of the men alive at age 65 are estimated to still be in the labor force. This relatively high level of attachment, however, obscures the fact that there is tremendous variability in the retirement life course; we estimate that it would take almost 15 years (IQR=14.7), given current transitions forces, for the life table cohort to decline from a 75% LFPR at age 58.3 to a 25% LFPR at age 73.0. The interquartile range is almost twice as long as period estimates from the 1980s (Henretta 1992) and largely reflects a substantial increase in the age by which just 25% of surviving men remain in the labor force. For a significant minority of men, it appears that working life has expanded well into old-age.

Women. At age 50, a quarter of women are not in the labor force with 7% work-disabled and 18% retired (see Column 1, Table 4). By age 60, only 53% of the original cohort is in the labor force, 8% are work-disabled, and the proportion retired has almost doubled to 33% (6% of the cohort has died). Few women alive at age 50 are in the labor force at the Social Security eligibility ages: less than half (46%) are in the labor force at age 62; just one-third (34%) are in the labor force at age 65.

[Insert Table 4 about here]

Women alive at age 50 exhibit a weaker attachment to the labor force, moving more quickly into retirement (see Column 2, Table 4). At age 50, women can expect to retire slightly more than once—1.02 times, but few become work-disabled (5%) or die while in the labor force (7%). Thus, retirement is by far the modal event for women and even more predominant than it is for men. Almost 90% of women's labor force exits occur via retirement compared to 82% of men's exits. Men are also 1.2 times more likely to experience a work-disability exit and more than twice as likely to die in the labor force as women, pointing to gender differences in the role of health-mandated exits in defining the retirement life course.

The expected volume of retirement for women is quite high at younger ages. In fact, Figure 5 shows that for women 45% of retirements occur before age 62 and 60% occur before age 65. Recall that 35% and 54% of men's retirements occur by ages 62 and 65, respectively. The concentration of retirement events before the Social Security eligibility ages likely reflects not simply the availability of alternative income sources (as with men), but joint retirement preferences between women and their (older) husbands and/or the competing demands of family responsibilities (O'Rand, Henretta and Krecker 1992; Warner and Hofmeister 2006). Still, a considerable amount of "late" retirement is evident; 34% of all women's retirement events occur after age 65. Although this level of "late" retirement is considerably lower than that of men, it is nonetheless substantial. Overall, almost four-fifths (79%) of women's retirement events occur outside the Social Security age-eligibility window—only slightly higher than for men (76%) (calculations not shown).

[Insert Figure 5 about here]

The high volume of retirement is fuelled in part by the fact that reentry to the labor force is also relatively common for women. About 35% of retirement exits are eventually reversed, along with 80% of work-disability exits. As with retirement, reentry is more common among younger women—56% of all retirements by age 60 are eventually reversed, compared to 50% by age 62 and 44% by age 65. Only one quarter of retirements after age 65 are ever reversed. Overall, women are more likely than men to reenter the labor force, as only 29% of men's retirement events and 67% of men's work-disability events are reversed.

At the population-level, most of women's retirement events are not reversed by reentry; however, it is apparent that reentry plays a prominent role in shaping women's retirement life course. Simulating the risk of reentry to be zero and recalculating the multistate life table shows that the average age of retirement would be two and a half years younger for women, declining from 63.7 to just 61.2 (results not shown, see Note 19). Thus, the relative impermanence of labor force exits is important at the population level for prolonging the work career.

The final column of Table 4 presents estimates for total life expectancy and state-specific life expectancies for women and demonstrates how the various exit, reentry, and mortality forces define the retirement life course of women. At age 50, women can expect to spend 11.31 years in the labor force—about 35% of their remaining life. Women can expect to spend the majority of their non-working years retired, about 57% (18.31 years) compared to just 8% (2.73 years) work-disabled, on average. While the proportion of expected life spent in retirement continues to increase and that spent in the labor force decreases with age, the expectation of life in work-disability remains relatively constant. Compared to men, the expectation of life in retirement is greater in both absolute and relative terms for women, reflecting both their higher risks of retirement and longer total life expectancies.

Older women's relatively short working life expectancy is a function of their low attachment to the labor force; the implied LFPR of women is slightly less than 75% at age 50 and declines steadily with advancing age to just 47% and 35% at the Social Security eligibility ages, respectively (see Table 5). This level of attachment is substantially lower than that of men.

However, women exhibit greater variability in the retirement life course than do men. We estimate that it would take 18.5 years for the LFPR of women in the life table cohort to decline from 75% to 25%, between ages 50 and 68.5. Recall, that the same decline for men, while starting much later (age 58.3), occurs in just 15 years. This high level of variability and relatively early onset suggests that, despite notable sensitivity to Social Security age-eligibility, the timing of retirement for many women does not coincide with specific institutional timetables.

[Insert Table 5 about here]

DISCUSSION

While retirement is a prominent and normative phase of the American life course, it has been decoupled from institutional schedules for a variety of reasons (Guillemard and Rein 1993; Han and Moen 1999; Henretta 1992). As a result, there is considerable individual-level uncertainty about the timing, permanence, and duration of retirement (Blossfeld et al. 2006). Prior studies include relatively limited empirical attention to clarifying the population-level retirement life course and, as institutional regularities have waned and individual-level uncertainty has increased, to determining whether new demographic regularities have emerged. An improved understanding of the retirement life course can anchor efforts to address the pressures that population aging places on both private and public pension systems. As the baby boom cohorts began reaching the early-eligibility age for Social Security in 2008, we set out to document the emergent demographic regularity of the retirement life course, providing answers to a number of key questions about the employment, work-disability and retirement behavior of older men and women. To summarize our findings, we return to the questions posed in the introduction.

How many people remain in the labor force at a given age, and how closely are declining rates in participation linked to entitlement ages for Social Security? The majority of men and women are working for pay as they enter the later-years. At age 50, 89% of men and 75% of women are in the labor force. However, the number of older workers declines swiftly with exit pressures mounting as they age through their mid-60s. Retirement exits jump dramatically at the Social Security eligibility ages of 62 and 65. These exit pressures are so pervasive that a majority of men and women alive at age 50 have left the labor force by ages 63 and 61, respectively.

How closely clustered is retirement around the Social Security eligibility ages? A substantial amount of retirement behavior occurs both "early" and "late," that is outside of the Social Security age-eligibility window. A little more than three-quarters of men's retirements are "off time" in terms of eligibility for Social Security; 35% of all men's retirement occurs before age 62 and 41% occurs after age 65. Early retirement is more pronounced among women and late retirement is less pronounced. Nonetheless, 79% of women's retirements are "off time" in terms of Social Security eligibility criteria, signaling an even looser coupling of women's work behavior with institutional timetables. The interquartile range of the implied LFPRs further demonstrates this variability. For men, it takes slightly less than 15 years for the LFPR to decline from 75% to 25%; it takes about 18.5 years to see a parallel decline in women's LFPR. Overall these results indicate that while the experience of retirement is near universal, the timing is highly variable, and at least for men this variability is increasing relative to the experience of cohorts retiring in the 1970s and 1980s (Hayward et al. 1988a; Henretta 1992).

Is retirement a single, irreversible event for most workers or do a significant proportion of workers exit and reenter multiple times? According to our analysis, most men and women exit the labor force only once. Yet, consistent with individual risks identified in previous research (Cahill et al. 2005; Elder and Pavalko 1993; Mutchler et al. 1997), we find that a substantial minority of retirements—about 29% for men and 35% for women—are reversed eventually. Moreover, and contrary to popular belief, we found high rates of reentry among those reporting they were work-disabled as 67% of men's and 80% of women's work-disability events are eventually reversed.[20] Not surprisingly, reentry is more common for younger members of the population. Thus, while a single exit from paid work remains the normative experience, the repeated departures and reentries of a sizeable minority of workers prolong the length of the average work career considerably. Indeed, our simulation shows that without reentry the average age at retirement would be about 2.3 years earlier for men and 2.5 years earlier for women.

How many years can people expect to work for pay, be work-disabled, and be retired over their lifetimes? The end result of all of the transitions into and out of the labor force, in combination with mortality, is that, at age 50, the average man can expect to spend just half of his remaining life in the labor force and, with very few years expected as work-disabled, about 41% of his remaining life retired. By age 55, the majority of his remaining life is expected to be spent in retirement (not shown). For women the expectation of retirement is greater than it is for men, consistent with their higher risks of exiting and lower labor force participation. Women at age 50 can expect to spend 57% of their remaining years retired, on average, and spend just 35% of their remaining life in the labor force and 7% work-disabled.

Overall, we find that the majority of older Americans exit the labor force prior to

[20] It is important to keep in mind, however, that our work-disability classification is based on self-identification as work-disabled or the report of a work limiting health condition expected to last at least three months. We would expect very little reentry among those receiving Social Security Disability Insurance benefits given the conditions necessary to qualify for and for continued receipt of benefits, including the requirement that the health-condition is expected to last at least one year and is either one of the predetermined "limiting conditions" or demonstrated by the claimant to be at least as severe. Social Security Disability Insurance eligibility is thus structured in a way that explicitly excludes the shorter-term—though clearly important—health mandated exits identified here.

reaching the institutional "normal" retirement age of 65—even in the face of a relatively high level of reentry behavior—and spend a substantial portion of their later years retired. We also find that the retirement life course is quite variable for both men and women and unfolds over a lengthy range of ages. However, the labor force behavior and retirement expectations of men and women differ substantially from one another, even as the working lives of cohorts entering the labor force since 1960 have converged, with women's retirement life course characterized by earlier withdrawal and higher reentry unfolding over a greater number of years compared to men.

We make several key advances over previous studies of the retirement life course, including our use of recent nationally-representative longitudinal data, differentiation between work-disability and retirement as distinct forms of non-participation and alternative pathways out of the labor force, and attention to the role of gender in defining the retirement life course (Cieka et al. 1995, 1999-2000; Hayward and Grady 1990; Hayward et al. 1988c; Schoen and Woodrow 1980). Nevertheless, some caution in interpreting our findings is warranted.

Most significantly, we urge care in interpretation because we do not have data on a single cohort. Rather, we pooled longitudinal information on the labor force transitions of several cohorts interviewed at different ages to create a synthetic cohort. Thus, our multistate working life tables are period estimates and reflect the expected lifetime labor force experiences of older adults *if the current transition rates remain stable*. This is an unrealistic expectation. However, in the face of foreseeable changes in these rates we believe that our findings about the absolute and relative length of the retirement life course are actually conservative. Two examples illustrate this point.

Assuming that the trend toward earlier retirement has indeed reversed (McDermott 1999) and older adults begin working later, one might then argue that we portray the retirement life course under conditions of low labor force participation by older adults and thus have underestimated the length of the work life. However, if anything, our results are slightly biased toward a later retirement age and more years spent working because the labor force participation rates observed in the HRS for those over 60 are higher than in the general population (See Footnote 5). In fact, our results suggest a substantial expansion of the working years and slower declines in the LFPR of older men with age relative to earlier estimates (Henretta 1992).

Expected advances in overall health and declines in mortality would also challenge the period based assumption of our model. Such improvements will likely delay or decrease the number of work-disability and health mandated retirement exits to some extent (Hayward and Grady 1990; Warner and Hofmeister 2006). Yet, given the relatively low volume of work-disability events relative to retirement events, the impact of such a shift on the average timing in the population would likely be minimal and would not change the overall expansion of the retirement years that would result from a decline in mortality.

Our study also leaves unaddressed several important issues that likely result in further heterogeneity in the retirement life course. First, in order to link the results with LFPRs calculated by national data monitoring agencies, we defined retirement as the cessation or absence of paid work. This conceptualization does not consider the fact, however, that a growing number of older workers are pursuing partial retirement strategies, including reduction in hours and working in non-career “bridge” jobs, before exiting the labor force (Cahill et al. 2005; Elder and Pavalko 1993; Mutchler et al. 1997) (See also Footnote 7). Moreover, defining retirement in this way masks unemployment as a pathway out of the labor force (Chan and Stevens 2003; Hardy 2006; Henretta 1992). The prevalence of such experiences at the population-level and the extent to which they differentiate the retirement life course is unclear.

Second, the present analysis does not speak to the fact that many more men and women are currently entering and are projected to enter their later years never married or divorced rather than married. As the traditional predictors of work and retirement behavior—wealth and health—are related to marriage (Warner and Hofmeister 2006), shifts in the marital status composition of the older population will generate additional variation in the retirement life course. Marriage differences in the retirement life course will likely be especially pronounced for women given their reliance on the spousal entitlement provisions of private and public pension systems (Harrington Meyer and Herd 2007; Harrington Meyer, Wolf and Himes 2006). The implication of changes in marital status for the constellation of transitions and roles that constitute the retirement life course is uncertain.

Third, we have not addressed the mechanisms that generate the gender differences we document in demographic regularity of the retirement life course. While socioeconomic and health characteristics are apt to be at the root of many of these differences, future studies should consider what part family roles and obligations play as well (Moen 2001; Warner and Hofmeister 2006), especially given our point above about population-level changes in marital status.

Finally, considerable racial/ethnic heterogeneity likely exists in the retirement life course of men and women. Prior studies consistently document that Blacks and Hispanics face more tenuous labor force prospects across the life course and exit at earlier ages than whites (Flippen 2005; Hsueh and Tienda 1996). Significantly, Blacks and Hispanics are more likely than whites to exit the labor force via work-disability (Brown and Warner 2008; Hayward et al. 1996). The expected growth in the racial/ethnic heterogeneity of the aged population (Angel and Angel 2006) necessitates understanding how such racial/ethnic differences in labor force transitions will combine to circumscribe further the expectation of working-life and retirement.

Understanding the retirement life course is essential for policy analysts to gauge demand for public and private pension benefits. Indeed, notwithstanding the limitations described above, our findings provide important information for public policy makers debating solutions to the long-term financial challenges of population aging. Perhaps most significantly, our findings suggest that the retirement life course unfolds in complex ways relative to public pension entitlement ages. Other meso-level institutions, such as the firm (Hardy, Hazelrigg and Quadagno 1996; Warner and Hofmeister 2006) and family (Harrington Meyer et al. 2006; O'Rand et al. 1992), also govern the labor force behavior of older Americans. The timetables of these institutions, along with individual preference and circumstance, do not necessarily coincide with those of Social Security (Guillemard and Rein 1993; Han and Moen 1999; Henretta 1992). Simply put, the retirement life course is not solely defined by Social Security benefit entitlement and financial ability (Atchley 1982; Costa 1998).

That the demographic regularity of the retirement life course is not synonymous with the institutional guidelines of Social Security suggests that previously legislated increases in the full-eligibility age to 67, and proposals circulating to raise it even further, may have a limited impact on labor force retention. While acknowledging the variability in the retirement life course, the fact remains that the majority of older Americans—about 58% of men and 66% of women—have already exited the labor force before the institutional “normal” retirement age of 65. Age 62 is the modal age of retirement with 42% of men and 58% of women alive at age 50 already out of the labor force. Even as the extra-institutional supports for early retirement have waned—namely defined benefit pension plans and other financial early retirement incentives (Hardy 2006; Hardy et al. 1996; Shuey and O'Rand 2004)—the pervasiveness of such programs appears to have resulted in the establishment of age-graded norms about retirement as a leisure entitlement that have entrenched this demographic regularity (Costa 1998; van Dalen and Henkens 2002). Accordingly, few men and women remain in the labor force between ages 65 and 67 when such an increase in the full-eligibility age would presumably have the greatest effect on labor force retention; in fact, our results indicate that just 41% of older men and 29% of older women alive at age 67 are working. Altogether, even with the increase in full-benefit eligibility to age 67 accompanied by an increasing penalty for early benefit receipt, it seems unlikely that the majority of older adults will forgo even reduced benefits to remain in the labor force given the strong propensity to exit before and upon reaching the age 62 early-eligibility benefit threshold (Wise 2004), especially given the competing timetables and incentives of employers and families. Thus, those that can afford (through some combination of savings, employer pensions or spousal earnings) to exit the labor force before eligibility for state-sponsored pension benefits are likely to continue to do so (even if it requires spending down any assets precipitously). What is more, increased benefit reduction is likely to have only marginal effects on labor force participation because older worker have demonstrated that they want to retire and are willing to make financial sacrifices to do so (Atchley 1982; Costa 1998; van Dalen and Henkens 2002).

While proposals to increase the age of full-eligibility for Social Security may have limited impact on older adults' labor force attachment, there are other (potentially unintended) consequences (O'Rand 2005). Specifically, changes in the age of full-benefit eligibility increasingly penalize the disadvantaged who begin collecting Social Security at age 62 (Hardy 2006), many of whom may do so as an alternative to work-disability (Brown and Warner 2008; Hayward et al. 1996), and women who exit earlier than men, often in response to caregiving demands (Harrington Meyer and Herd 2007; Warner and Hofmeister 2006). Consequently, raising the Social Security full-retirement age without also addressing the early-eligibility age is likely to relieve part of the programmatic burden not by increasing the labor force retention of older adults but by increasingly penalizing low income workers through a reduction in benefits—a particularly harsh penalty for individuals who may involuntarily exit the labor force “early” and can least afford this reduction (Haveman et al. 2003).

APPENDIX A: MEASUREMENT OF LABOR FORCE STATUS IN THE 1993 AHEAD

Although the AHEAD was initiated as a companion study to the HRS, the two studies were not compatible prior to the decision to move the HRS to a steady-state panel and merge in the AHEAD cohort (see HRS 2000). Unfortunately, detailed questions about paid work behavior were not asked of the AHEAD respondents until the second (1995) interview, by which time the merger decision had been made. The 1993 AHEAD interview only asked whether the respondent was or was not working for pay; whether non-working respondents were retired, work-disabled or in some other status was not ascertained. Although RAND (2006) backfills information to make Wave 1 classifications, the 1993 labor force status for 3,111 AHEAD non-working respondents remained unknown because they died before reinterview (n = 786), dropped out of the study (n = 347), or stated that they had not worked in the last 2 years (n = 1,978). How these AHEAD respondents with missing work status in 1993 were handled had an impact on our multistate life table estimates.

Excluding AHEAD respondents with an unknown labor force status in 1993 eliminated a large proportion of death events and biased the multistate life table expectancies upward. Likewise, assuming these respondents were retired as suggested by RAND (2006), and that consequently none were work-disabled, biased multistate life expectancy estimates upward because there were no data on which to fit the model from work-disability to death at the older ages. As the single-decrement life expectancy estimates were realistic in comparison to U.S. Vital Statistics reports, and the constituent state-specific life expectancies sum to the total life expectancy in the MSLT framework, we determined that allocation of these AHEAD respondents between the non-working origin states in 1993 must be driving the bias in the preliminary multistate life table estimates and that an alternative allocation was necessary.

Consequently, we assigned an initial labor force status to respondents who were out of the labor force at their first interview based on their responses to related sorts of questions. For example, the 1,987 respondents who reported that they had not worked in the past two years and identified as retired or work-disabled in 1995 were assigned this status in 1993. We categorized the remaining respondents, who were either working or deceased at the second interview (n = 1,133), as work-disabled or retired depending on their reported difficulty with five dichotomous indicators of activities of daily living (ADL) in 1993 (i.e., difficulty walking one block, climbing a flight of stairs, lifting ten pounds, pushing or pulling a large item, and picking up a dime from a table). We assumed that ADL limitations were a proxy for whether a health condition prevented the respondent from working for pay because a direct measure was not available in 1993. Initially, we categorized respondents as work-disabled in 1993 if they were in the top 10% of the distribution on a summary measure of five standard ADL impairments, which corresponded to the prevalence of work-disability among *AHEAD* respondents with a known labor force status; i.e., men with four or more ADL impairments and women with five impairments were classified as work-disabled. However, assigning all persons with the specified level of impairment as work-disabled resulted in too few cases in the retired state (given the increase in impairments with age), and a low mortality rate and elevated life expectancy estimates. Thus, we limited work-disability classifications to those less than 85 years of age, which yielded accurate life expectancies. We assigned the remaining respondents as retired. Alternative strategies for making these categorizations, including a probabilistic model, did not fit the data as well.

Table B1. Hazard Model Estimates for Age-Specific Labor Force Transition Rates, Men over 50 in the Health and Retirement Study (HRS), 1992-2004[a]

Origin State	From ILF to			From DIS to		From RET to	
Destination State	DIS	RET	MT	ILF	MT	ILF	MT
Age Parameters							
Age	-0.1029***	-91.3031**	0.0842***	-0.0693***	0.0612***	0.1193	-0.1948***
Age^2		2.6934**				-0.0018**	0.0016***
Age^3		-0.0392**					
Age^4		0.0003**					
Age^5		< -0.0001**					
Age 62	-0.1224	0.4887***		-0.1219		-0.2037	
Age 65		0.2187**				0.0535	
Constant	0.5538	1215.4381**	-9.8524***	0.5065	-7.7954***	-3.1258	2.5476*
N of Person-Intervals	16438	19317	19325	3512	3512	16209	16209
N of Events	153	2919	354	142	164	796	2058
Log Likelihood	-858.93	-9452.88	-1865.93	-693.45	-748.20	-3325.10	-7656.56

Notes:

[a] Labor force states are abbreviated: ILF = In the labor force, DIS = Work-Disability, RET = Retirement, MT=Death.

† $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$ (two-tailed tests)

Table B2. Hazard Model Estimates for Age-Specific Labor Force Transition Rates, Women over 50 in the Health and Retirement Study (HRS), 1992-2004[a]

Origin State	From ILF to			From DIS to		From RET to	
Destination State	DIS	RET	MT	ILF	MT	ILF	MT
Age Parameters							
Age	1.9231**	0.3044***	0.0790***	-0.1031***	0.0950***	0.0563	-0.0655*
Age^2	-0.0170**	-0.0019***				-0.0014**	0.0009***
Age 62	-1.9231**	0.4536***		0.0910		0.0420	
Age 65		0.4366***				0.2230*	
Constant	-59.2438**	-13.8329***	-10.0631***	2.2143*	-10.7009***	-1.2109	-3.5297**
N of Person-Intervals	15646	17763	17763	5495	5495	28024	28024
N of Events	160	3205	173	165	161	1138	2143
Log Likelihood	-916.14	-10020.62	-100.58	-842.63	-788.72	-4756.73	-8893.82

Notes:

[a] Labor force states are abbreviated: ILF = In the labor force, DIS = Work-Disability, RET = Retirement, MT=Death.

† $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$ (two-tailed tests)

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Table 1. Distribution of Events in the Working Life Model by Sex [a,b]

	Men							Women					
	Origin State (%)	Destination States (%)						Origin State (%)	Destination States (%)				
		ILF	DIS	RET	MT	Attrit			ILF	DIS	RET	MT	Attrit
ILF	50.13	77.60	0.70	15.06	1.82	4.82	ILF	34.61	75.59	0.84	17.92	0.97	4.68
DIS	8.41	4.05	87.27	—	4.30	4.38	DIS	9.88	3.01	90.88	—	2.71	3.39
RET	41.47	4.84	—	79.50	12.37	3.28	RET	55.51	3.94	—	84.83	7.49	3.75
Total		41.25	7.69	40.52	6.40	4.15	Total		28.62	9.27	53.29	4.76	4.04

Notes:
N = 39,584 weighted person-intervals for men, *N* =52,349 weighted person-intervals for women
[a] The distribution of events refers to the percentage of person-intervals observed in a given labor force category (origin state) at the beginning of the interval that are in a given labor force category at the end of the interval (destination state).; rows may not sum to 100 due to rounding error.
[b] Labor force states are abbreviated: ILF = In the labor force, DIS = Work-Disability, RET = Retirement, MT = Death, Attrit = Panel Attrition.

Table 2. Summary Measures from Multistate Working Life Tables for Men over Age 50, Selected Ages [a,b]

	Survivorship (l_{ix}/l_{50})[c]			Number of Events ($\sum d_x/l_{ix}$)[d]							Life Expectancy (e_x)			
				From ILF to			From DIS to		From RET to			State Expectancies		
Age	ILF	DIS	RET	DIS[e]	RET	MT	ILF	MT	ILF	MT	Total	ILF	DIS	RET
50	0.89	0.06	0.05	0.06	1.01	0.16	0.04	0.08	0.29	0.76	27.11	13.78	2.27	11.06
55	0.80	0.08	0.09	0.03	0.94	0.15	0.03	0.07	0.26	0.78	23.01	9.90	1.99	11.12
60	0.66	0.08	0.18	0.01	0.82	0.13	0.02	0.07	0.21	0.80	19.20	6.44	1.67	11.09
62	0.58	0.08	0.23	0.00	0.74	0.12	0.02	0.07	0.19	0.81	17.80	5.25	1.55	10.99
65	0.42	0.07	0.34	—	0.56	0.10	0.01	0.07	0.15	0.82	15.88	3.85	1.39	10.64
70	0.24	0.06	0.42	—	0.34	0.08	0.01	0.07	0.08	0.85	13.02	2.23	1.17	9.63
75	0.13	0.05	0.41	—	0.20	0.06	0.00	0.07	0.04	0.87	10.45	1.20	0.99	8.26
80	0.06	0.04	0.34	—	0.11	0.04	0.00	0.08	0.02	0.88	8.13	0.56	0.85	6.71
85	0.02	0.03	0.24	—	0.05	0.02	0.00	0.09	0.01	0.89	6.08	0.22	0.77	5.09
90	0.00	0.02	0.13	—	0.01	0.02	0.00	0.11	0.00	0.88	4.40	0.11	0.78	3.52

Notes:

[a] Full Life Tables are available from the first author on request

[b] Labor force states are abbreviated: ILF = In the labor force, DIS = Work-Disability, RET = Retirement, MT=Death.

[c] Proportion of persons alive at age 50 who are in a given state at age *x*. Numbers may not sum to 100 due to rounding error.

[d] The cumulative number of a given event that an average individual can expect between age *x* and 100.

[e] Cells contain a — when the transition probability is defined to be zero; See Figure 1.

Table 3. Life Table Labor Force Participation Rates, Men at Selected Ages

Age	LFPR
50	0.88
55	0.82
60	0.71
62	0.61
65	0.48
70	0.32
75	0.21
80	0.13
Summary Indicators	
First Quartile Age	58.3
Median Age	64.6
Third Quartile Age	73.0
IQR	14.7

Note: The IQR is the interquartile range, the time in years between a 75% and a 25% labor force participation rate.

Table 4. Summary Measures from Multistate Working Life Tables for Women over Age 50, Selected Ages [a,b]

	Survivorship (l_{ix}/l_{50})[c]			Number of Events ($\sum d_x/l_{ix}$)[d]							Life Expectancy (e_x)			
				From ILF to			From DIS to		From RET to			State Expectancies		
Age	ILF	DIS	RET	DIS[e]	RET	MT	ILF	MT	ILF	MT	Total	ILF	DIS	RET
50	0.75	0.07	0.18	0.05	1.02	0.07	0.04	0.08	0.36	0.84	32.34	11.30	2.73	18.31
55	0.68	0.07	0.22	0.03	0.89	0.07	0.02	0.08	0.26	0.85	27.99	7.84	2.44	17.71
60	0.53	0.08	0.33	0.01	0.70	0.05	0.01	0.08	0.18	0.86	23.83	4.86	2.10	16.87
62	0.46	0.08	0.38	0.00	0.61	0.05	0.01	0.08	0.15	0.87	22.24	3.88	1.96	16.41
65	0.34	0.08	0.48	—	0.46	0.04	0.01	0.08	0.11	0.88	19.97	2.70	1.75	15.51
70	0.19	0.07	0.57	—	0.25	0.03	0.00	0.08	0.06	0.89	16.44	1.40	1.43	13.61
75	0.09	0.06	0.58	—	0.13	0.02	0.00	0.08	0.03	0.89	13.24	0.67	1.15	11.42
80	0.04	0.05	0.52	—	0.06	0.01	0.00	0.09	0.01	0.90	10.37	0.31	0.90	9.16
85	0.01	0.04	0.41	—	0.02	0.01	0.00	0.09	0.00	0.90	7.86	0.15	0.68	7.03
90	0.01	0.03	0.27	—	0.01	0.01	0.00	0.09	0.00	0.91	5.74	0.08	0.50	5.15

Notes:

[a] Full Life Tables are available from the first author on request

[b] Labor force states are abbreviated: ILF = In the labor force, DIS = Work-Disability, RET = Retirement, MT=Death.

[c] Proportion of persons alive at age 50 who are in a given state at age *x*. Numbers may not sum to 100 due to rounding error.

[d] The cumulative number of a given event that an average individual can expect between age *x* and 100

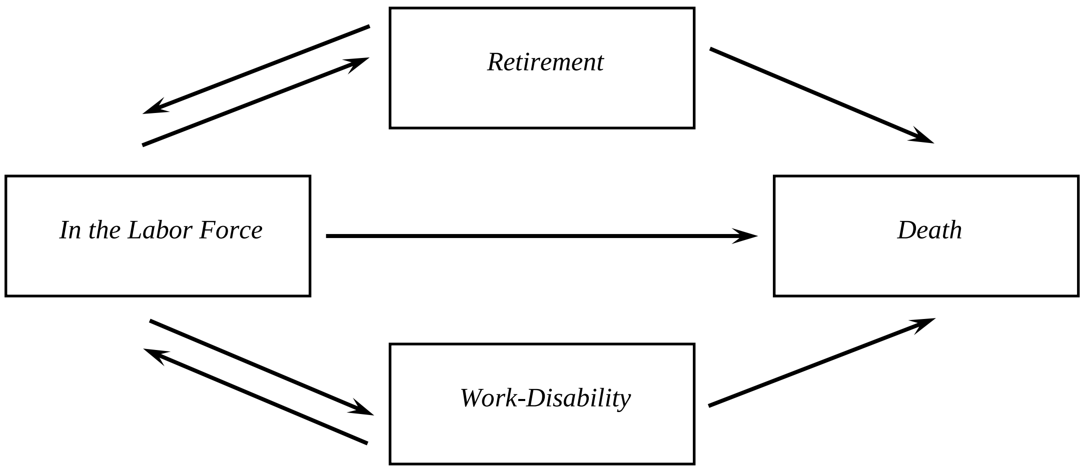
[e] Cells contain a — when the transition probability is defined to be zero; See Figure 1

Table 5. Life Table Labor Force Participation Rates, Women at Selected Ages

Age	LFPR
50	0.75
55	0.69
60	0.55
62	0.47
65	0.35
70	0.21
75	0.12
80	0.06
Summary Indicators	
First Quartile Age	50.0
Median Age	61.3
Third Quartile Age	68.5
IQR	18.5

Note: The IQR is the interquartile range, the time in years between a 75% and a 25% labor force participation rate.

Figure 1: Multistate Life Table Model of the Retirement Life Course



Note: There are 3 model states, 1 absorbing state (death), and 7 possible transitions between these states as denoted by the arrows.

Figure 2: Age-Specific Risk of *Exiting* the Labor Force, Hazard Model Estimates for Men and Women

Figure 3: Age-Specific Risk of *Reentering* the Labor Force, Hazard Model Estimates for Men and Women

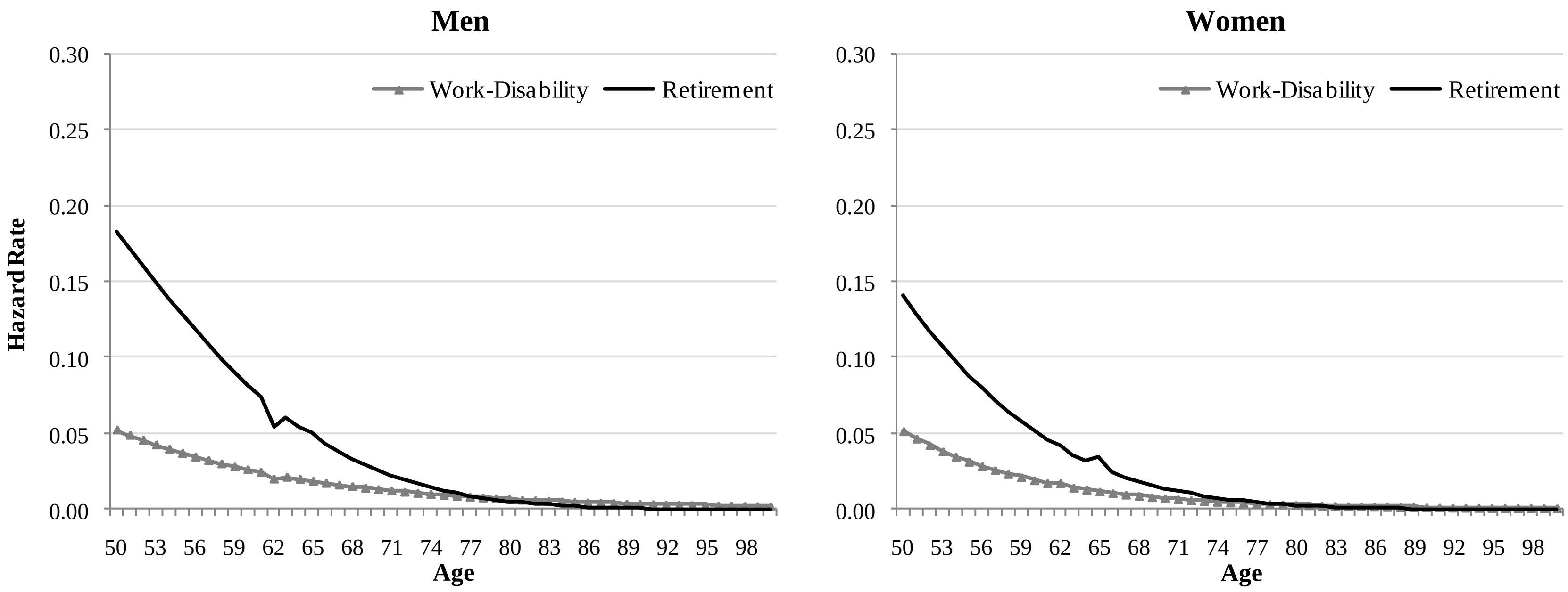


Figure 4: Comparison of the Age-Specific Retirement Transition Rates to the Volume of Retirement Exits Implied by the Multistate Working Life Table Model, Men

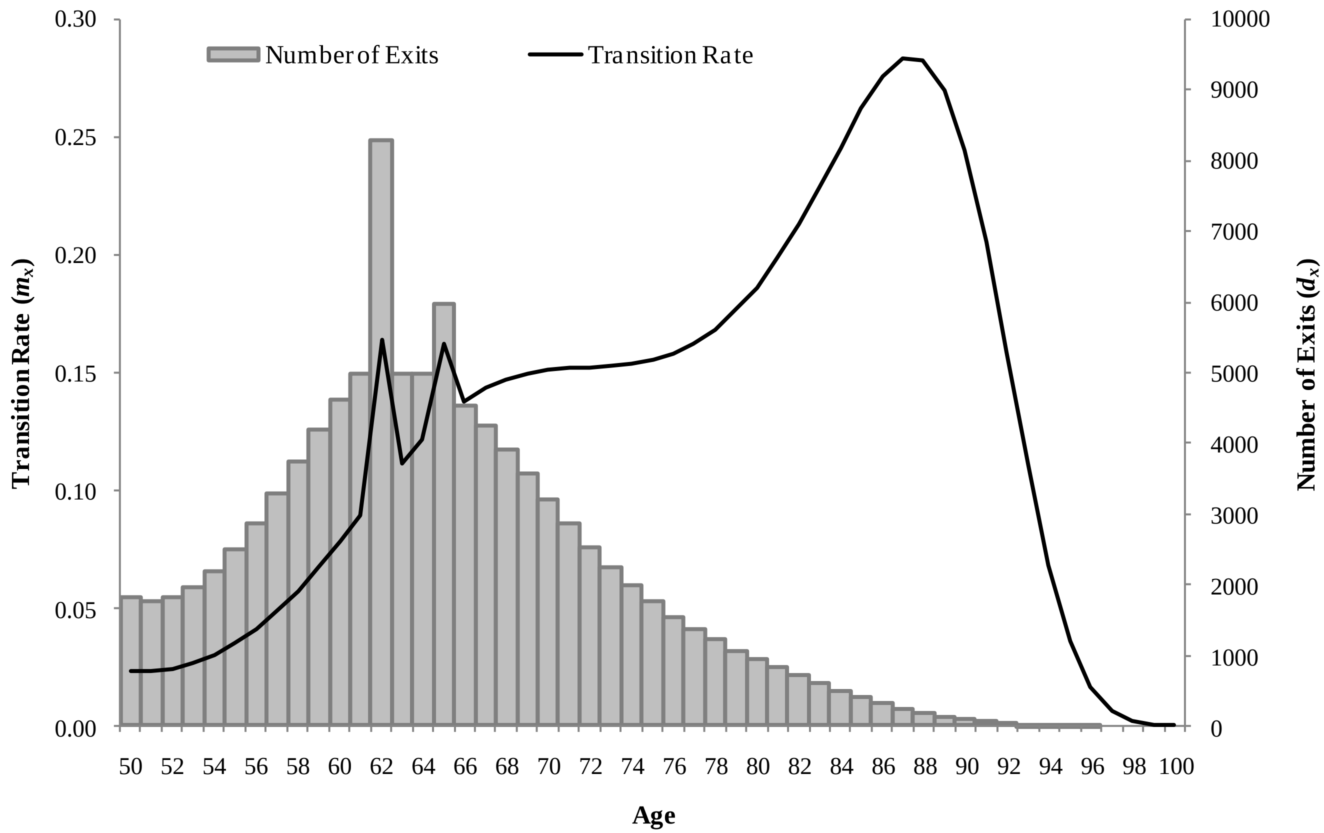


Figure 5: Comparison of the Age-Specific Retirement Transition Rates to the Volume of Retirement Exits Implied by the Multistate Working Life Table Model, Women