Baby Boomers in the United States: Factors Associated With Working Longer and Delaying Retirement

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Objectives *This study estimated the self-reported probability of working full-time past age 62 (P62) or age 65 (P65) among four cohorts of Americans born between 1931 and 1959.*
Methods *Data from the Health and Retirement Study (HRS) were analyzed. Respondents in four age cohorts were selected for comparison. Multivariable linear regression models were used to assess cohort differences in P62 and P65 while adjusting for covariates.*
Results *P62 and P65 increased among boomers despite worsened self-rated health compared to the two preceding cohorts, with 37% and 80% increases among mid-boomers in construction trades. Cohort differences in P62 and P65 remained after controlling for covariates. Changes in pensions, income inequity, and education were significantly associated with work expectations, but SSA policy was not.*
Conclusions *Baby boomers expect to work longer than their predecessors. Efforts to improve work quality and availability for older workers are urgently needed, particularly in physically demanding occupations.* Am. J. Ind. Med. 60:315–328, 2017.
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KEY WORDS: aging workforce; construction workers; pension plans; health; wealth

INTRODUCTION

In 2014, the youngest of the baby boomer cohort (those born between 1946 and 1964) turned 50 years old. By 2030, over 20% of the U.S. population is projected to be 65 years or older, compared to 13% in 2010 [Ortman et al., 2014]. Concern over the ability to support an increasing proportion of retirees in the U.S. population has sparked widespread interest among individuals, policy makers, and society in promoting delayed retirement and longer working lives. The aging of the baby boomer cohort and the increased participation of older workers in the labor force have resulted in an aging workforce [Mermin et al., 2007; Tang et al., 2013]. The percentage of U.S. workers aged 55 years and older increased from 11.9% in 1994 to 21.7% in 2014, and is expected to increase to 24.8% by 2024 [Toossi, 2015]. In addition, older workers performing physically demanding work are increasing. From 1985 to 2015, the proportion of construction workers aged 55 and older increased from 12% to more than 20% [Current Population Survey (CPS), 2016].

Along with demographic characteristics, several other factors may underlie the trends of the aging workforce in the U.S. In recent years, many employers have replaced defined benefit (DB) pension plans with defined contribution (DC) pension plans, and have eliminated health-care benefits for retirees [Burtless and Aaron, 2012; CPWR, 2013; Nyce et al., 2013]. Despite the Affordable Care Act, individuals without employer-funded retiree health benefits are likely to

postpone retirement in order to keep their insurance benefits [Nyce et al., 2013; Levy et al., 2015]. On the other hand, increasing age eligibility for full retirement benefits, increasing penalties for early retirement, and substantially increasing the delayed retirement credit (DRC) for Social Security benefits have been structured to encourage individuals to retire later in life [Hurd and Rohwedder, 2011; Tang et al., 2013].

Moreover, baby boomers experienced decreases in wealth from sources such as the stock and housing markets, and increases in late-life debt following the 2008 recession [Mann, 2011; McFall, 2011; Szinovacz et al., 2014, 2015; Ondrich and Falevich, 2016]. Using pre- and post-crash surveys from the Cognitive Economics study, McFall [2011] found that the average wealth loss between July 2008 and May/June 2009 was associated with an increase in the average planned retirement age of approximately 2.5 months. Goda et al. [2011] found that between 2006 and 2008, self-reported probabilities of working at ages 62 and 65 significantly increased.

In addition to these demographic and economic factors, baby boomers in general have achieved higher educational statuses and have expressed expectations for continued work at older ages that differ from patterns established by earlier cohorts of U.S. workers [Mermin et al., 2007].

While many older workers stay in the labor market for various reasons, some individuals may be forced to retire earlier than anticipated, despite preferences to continue to work. Studies have documented that poor self-rated health, depression, chronic health conditions, and reduced cognitive functioning lower the expected retirement age [McGarry, 2004; Doshi et al., 2008; Van Rijn et al., 2014]. In a longitudinal survey of construction workers 40 years and older, Alavinia et al. [2009] found that moderate or poor work ability was highly predictive of receiving a disability pension. In another study of construction workers between the ages of 40 and 59 years, Welch et al. [2010] identified musculoskeletal disorders and other medical conditions to be associated with a premature exit from the workforce.

Workers in physically demanding occupations generally retire earlier than others [Holden, 1988; Hayward et al., 1989; Johnson et al., 2011]. In particular, construction workers in a number of countries have been found to stop working at an earlier age than other workers [Brenner and Ahern, 2000; Liira et al., 2000; Capanni et al., 2005; Welch, 2009; Järvholm et al., 2014]. In a recent study, Belbase et al. [2015] demonstrated that blue-collar workers were especially susceptible to early declines in ability that inhibit their ability to work to the full retirement age under the current Social Security policy.

Despite widespread interest in delaying retirement, most research has focused on limited factors and very few studies have examined retirement timing and generational differences. A better understanding of why workers stay in the workforce longer or leave earlier may help inform policy and safety and health interventions that are beneficial to individuals, employers, and the Social Security system. To further understand the factors that impact the intention to work at older ages, this study examined the self-reported probability of working full-time after ages 62 and 65 among baby boomers compared to their predecessors at similar ages. Occupational differences, changes in Social Security, and other potential predictors for working at older ages were also explored in this study.

MATERIALS AND METHODS

Data Source and Study Cohorts

This study analyzed data from the Health and Retirement Study (HRS), a nationally representative longitudinal survey of Americans over the age of 50 conducted by the University of Michigan's Survey Research Center for the National Institute on Aging since 1992. The initial sample (or the original HRS cohort) contained 12,652 people who were born between 1931 and 1941. Several age cohorts have been added to this survey since 1992, including the War Baby cohort (WB; born between 1942 and 1947), the Early Baby Boomer cohort (EBB; born between 1948 and 1953), and the Middle Baby Boomer cohort (MBB; born between 1954 and 1959). These new cohorts expanded the HRS sample size to more than 26,000 people, thereby allowing subgroup comparisons.

The HRS is conducted every 2 years and collects detailed information on demographics, employment, pension plans, income, wealth, self-perceived health status, retirement expectations, and many other factors. Although the self-reported probabilities of retirement at ages 62 and 65 do not perfectly predict actual retirement age, the predictive power has been found to be stable across cohorts; the use of subjective probabilities rather than actual retirement ages provides continuous rather than binary variables that make it easier to control for fixed effects [Hurd, 2009]. To compare retirement expectations across cohorts, the individuals that were included in the analyses were restricted to the respondents who were working (or not yet retired) when they were interviewed between the ages of 53–58 years. According to these criteria, a total of 11,555 respondents were selected from four survey waves for this study, with 3,694 of the HRS cohort in 1994, 2,049 WBs in 2000, 2,382 EBBs in 2006, and 3,430 MBBs in 2012.

Measures and Definitions

Variables were selected from the RAND HRS data version O, a cleaned and ready-to-use version of the HRS data [Chien et al., 2015]. The self-reported probability of

working full-time past age 62 (P62) or age 65 (P65) was derived from the following question: "What do you think are the chances that you will be working full-time after you reach age 62?" The survey asked the same question about work past age 65. These "subjective probability" questions have been asked in each survey and measured using a 0–100% scale since 1994.

Occupation was based on the longest-held occupation reported by the respondent in the survey year. Because the occupational coding schemes for the HRS data have changed over the years [Nolte et al., 2014], similar occupations were aggregated when possible in order to ensure comparability over time. For example, "construction trades" and "extraction occupations" reported in Wave 2006 and Wave 2012 were combined to match the category "construction and extraction" used in the surveys prior to 2004 (since only a few respondents were in extraction occupations, the term "construction trades" was used). As a result, five major occupational categories were regrouped for the analysis: construction trades, other blue-collar workers, sales/services, other white-collar workers, and management (used as the referent). A supplemental table (see Attachment 1) displays how these occupations were regrouped.

Perceived physical health was based on the question, "Would you say your health is excellent, very good, good, fair, or poor?" This question was asked for every respondent in each wave in which the categories "excellent" and "very good" were combined for this study, as well as "fair" and "poor." *Mental health* was measured by the Center for Epidemiologic Studies Depression (CES-D) scale, ranging from 0 to 8, with higher scores representing poorer mental health. The *number of health conditions* was based on questions asking whether the respondent had ever been told by a doctor that they had the medical condition (e.g., high blood pressure, diabetes, cancer, lung disease, heart disease, stroke, psychiatric problems, and arthritis). *Work limitation* was based on the question, "Do you have any impairment or health problem that limits the kind or amount of paid work you can do?" *Overweight* and *obesity* were defined using the Centers for Disease Control and Prevention (CDC), [2010] guideline of body mass index (BMI; CDC, 2010). *Smoking status* includes "never smoker" (never smoked cigarettes in their lifetime), "former smoker" (smoked cigarettes in their lifetime, but were not currently smoking), and "current smoker."

Total household income includes the earnings and non-job income of the respondent and his/her spouse or partner. The net value of *all non-housing wealth* is the sum of the appropriate wealth components (e.g., stock, cash) minus debt. Both income and wealth were adjusted by the Consumer Price Index (CPI) in constant 2012 dollars for comparability over time.

Statistical Analysis

The mean of P62 and P65 for each age cohort was calculated and compared among subgroups within each cohort. Mean, median, and quartile of total household income and all non-housing wealth were estimated for all age cohorts and compared over time. Chi-Square test, ANOVA test, and Kruskal–Wallis test were used to evaluate whether differences among age cohorts were statistically significant at the a = 0.05 level [Van Hecke, 2012]. Four multivariable linear-regression models were used to assess cohort differences in P62 and P65 separately while adjusting for covariates. A dummy variable denoting the age of eligibility for full Social Security benefits over time was created and used in Model 1 to estimate the association between changes in the Social Security system and retirement expectations. Model 2 included a set of indicators that are commonly found to be predictive of retirement expectations (e.g., gender, race and Hispanic ethnicity, educational attainment, marital status, and occupation). Model 3 added economic factors (e.g., pension plans, income, and wealth) as predictors. Model 4 tested the health effect on P62 and P65 besides the aforementioned factors. The HRS sample weights, primary sampling unit markers, and strata markers were applied in all computations so that the results could be generalized to the population of older American workers. SURVEY procedures in SAS 9.4 were used for the data analyses [SAS Institute Inc., 2014].

RESULTS

Table I summarizes worker characteristics for each of the cohorts. Respondents employed in the construction trades accounted for 5% to 6% of participants across the cohorts. The percentage of white workers decreased while the percentage of black or other racial minorities increased among baby boomers compared to previous cohorts ($P < 0.001$). Educational attainment improved considerably across cohorts: 34% of EBBs and 35% of MBBs held a college degree or above, compared to 22% of HRS and 30% of WBs, respectively ($P < 0.001$). Cohorts also differed in marital status ($P < 0.001$). The percentage of those married or partnered declined, while the percentage of never married nearly tripled from 3.6% in the HRS cohort to 9.2% in the MBBs. During the same period, union membership decreased and employer-sponsored DB pension plans declined as well ($P < 0.001$). Only 20% of MBBs had DB pensions, down from 34% for the HRS cohort. On the other hand, the proportion of workers with DC pensions increased; only 21% of the HRS cohort had DC pensions, compared to 37% of MBBs ($P < 0.001$).

Table I also demonstrates a gradual decline in self-reported health and an increase in health conditions over time ($P < 0.001$). About 15.9% of MBBs reported three or more health conditions, more than double the percentage (7.6%)

TABLE I. Sample Characteristics of Older Workers by Cohort

Characteristics	HRS (1936–1941) 1994 (n = 3,694)	WB (1942–1947) 2000 (n = 2,049)	EBB (1948–1953) 2006 (n = 2,382)	MBB (1954–1959) 2012 (n = 3,430)	P-value[a]
Mean age at interview[b]	55.3	55.3	55.4	55.4	0.180
Longest occupation					<0.001
Construction trades	5.0%	5.1%	6.0%	6.3%	
Other blue-collar workers	22.7%	22.1%	22.2%	19.5%	
Sales/services	22.1%	20.1%	27.5%	30.2%	
Other white-collar workers	33.5%	35.1%	28.4%	31.5%	
Management	16.7%	17.6%	15.9%	12.5%	
Female	51.2%	50.9%	50.4%	51.3%	0.875
Race					<0.001
White	87.7%	87.1%	82.6%	80.4%	
African American	8.7%	8.5%	10.3%	11.1%	
Other race	3.6%	4.4%	7.2%	8.4%	
Hispanic origin	6.3%	7.3%	7.8%	9.3%	0.182
Education					<0.001
High school or less	55.2%	42.7%	35.4%	36.5%	
Some college	23.2%	27.1%	30.8%	28.8%	
College and above	21.7%	30.1%	33.9%	34.6%	
Marital status					<0.001
Separated/divorced	15.4%	18.2%	17.6%	17.3%	
Widowed	4.6%	4.0%	3.3%	2.6%	
Never married	3.6%	4.0%	5.5%	9.2%	
Married/partnered	76.4%	73.8%	73.5%	70.8%	
Union membership	21.5%	21.3%	17.1%	17.5%	<0.001
Pension plan					<0.001
No pension	48.9%	41.7%	47.4%	48.2%	
DC	17.7%	27.5%	26.7%	31.7%	
DB	29.8%	27.2%	23.0%	15.0%	
DB+DC	3.6%	3.7%	2.8%	5.1%	
Self-reported physical health					<0.001
Excellent/very good	58.9%	61.1%	57.0%	53.2%	
Good	28.5%	26.8%	28.0%	29.8%	
Fair/poor	12.5%	12.1%	15.1%	16.9%	
Self-reported mental health (CES-D)					<0.001
0	57.5%	46.8%	47.8%	47.9%	
1	20.3%	22.2%	21.5%	23.8%	
2	7.2%	11.2%	10.4%	8.5%	
3–8	15.0%	19.7%	20.3%	19.7%	
Number of health conditions					<0.001
0	41.7%	39.5%	32.7%	29.4%	
1	34.9%	32.6%	36.6%	32.5%	
2	15.8%	19.5%	18.6%	22.2%	
3–8	7.6%	8.4%	12.0%	15.9%	
Health limits work	12.8%	10.9%	12.8%	15.1%	<0.001
BMI					<0.001
Under weight	1.1%	0.6%	0.6%	0.6%	
Normal weight	34.3%	29.1%	25.5%	24.0%	
Over weight	41.5%	41.7%	39.8%	37.5%	

TABLE I. (*Continued*)

Characteristics	HRS (1936–1941) 1994 (n = 3,694)	WB (1942–1947) 2000 (n = 2,049)	EBB (1948–1953) 2006 (n = 2,382)	MBB (1954–1959) 2012 (n = 3,430)	P-value[a]
Obese	23.1%	28.6%	34.2%	37.9%	
Smoking status					<0.001
Current smoker	25.4%	21.5%	18.8%	19.6%	
Former smoker	37.8%	38.8%	34.4%	35.4%	
Never smoker	36.8%	39.7%	46.9%	45.0%	
Household income[c]					
Mean[b]	$101,246	$120,333	$152,309	$107,732	0.011
Median[b]	$72,562	$84,709	$80,274	$73,872	0.252
Non-housing wealth[c]					
Mean[b]	$91,786	$124,405	$107,497	$100,262	0.095
Median[b]	$18,587	$14,917	$11,143	$3,478	<0.001
Weighted number in millions (%)	10.07 (100)	12.64 (100)	17.36 (100)	20.10 (100)	–

All percentages were weighted.
[a]P-value from chi-square tests.
[b]P-value from Kruskal–Wallis test.
[c]Adjusted to 2012 dollars.

for the HRS cohort. During the same time period, the trends of smoking status and BMI—two important health indicators—moved in opposite directions ($P < 0.001$). The prevalence of current cigarette smoking dropped from 25.4% in the HRS cohort, to 18.8% in EBBs and 19.6% in MBBs, respectively; while the rate of obesity jumped from 23.1% in the HRS cohort to 34.2% in EBBs and 37.9% in MBBs ($P < 0.001$). Furthermore, large differences in mean and median wealth were observed across all age cohorts. While there was no significant difference in median household income among the age cohorts after adjusting for inflation, the median non-housing wealth for MBBs was only $3,478, less than one fifth that for the HRS cohort ($18,587, $P < 0.001$). Moreover, the ratio of mean to median non-housing wealth jumped from 4:1 among the HRS cohort in 1994 ($91,786 vs. $18,587; in 2012 dollars) to 28:1 among the MBB cohort in 2012 ($100,262 vs. $3,478) when the cohorts were at similar ages.

Table II shows the simple relationships between each potential factor and the expectations of working full-time after ages 62 and 65. The highest P62 and P65 were found among the MBB cohort, with P62 at 53.9% and P65 at 40.7%, respectively. The difference in P65 was more striking: about 41% of MBBs reported they expected to work full-time past age 65, nearly double the probability (22.8%) for the HRS cohort ($P < 0.001$). Among workers whose longest job was in construction trades, P62 increased from 40% for the HRS cohort to 48% for EBBs and 55% for MBBs; while P65 increased from 23.8% for the HRS cohort to 30.6% for EBBs and 42.9% for MBBs ($P < 0.001$). Both P62 and P65 were typically lower among women and black workers, as well as for those who were married or partnered,

but the expectations for these workers increased among successive cohorts ($P < 0.001$). P62 and P65 increased with educational attainment ($P < 0.001$); however, the difference between educational levels somewhat narrowed among successive cohorts. Pension coverage was strongly associated with work expectations at older ages ($P < 0.001$). For all cohorts, workers without any pensions had the highest P65, while workers with DC pension coverage generally had the highest P62. Workers who were union members had lower work expectations at older ages than non-union workers, which was consistent over time. The pattern for work expectations and total household income was inconsistent. In contrast, the relationship between work expectations and non-housing wealth was steady: the respondents in lower wealth quartiles expected to work longer than their richer counterparts ($P < 0.001$).

Table III presents P62 and P65 stratified by health indicators. Even though expectations for continuing full-time work increased over time, older workers with poor health generally had a lower work expectation than their counterparts with excellent/very good health in all cohorts. However, the increased expectations among successive cohorts of workers with work limitations were remarkable ($P < 0.001$). While only 18.2% of the HRS cohort with work limitations planned to continue working past age 65, 31.7% of MBBs with work limitations planned to do so. Neither smoking nor obesity was associated with the expected probability of full-time work past age 65, despite changed prevalence over time.

The adjusted regression coefficients (β) and standard errors (S.E.) from the multivariable linear regression models for P62 and P65 are reported in Table IV. After controlling

TABLE II. Self-Reported Probability of Working Full-Time After Ages 62 and 65 Among Older Workers by Characteristics

	P62				P65			
Cohort	**HRS**	**WB**	**EBB**	**MBB**	**HRS**	**WB**	**EBB**	**MBB**
Birth year	1936–1941	1942–1947	1948–1953	1954–1959	1936–1941	1942–1947	1948–1953	1954–1959
Interview year	1994	2000	2006	2012	1994	2000	2006	2012
Sample size	3,694	2,049	2,382	3,430	3,694	2,049	2,382	3,430
All	42.3%**	49.9%**	52.0%**	53.9%**	22.8%**	31.6%**	34.7%**	40.7%**
Longest occupation								
Construction trades	40.1%**	59.7%**	48.4%**	55.1%**	23.8%**	40.7%**	30.6%**	42.9%**
Other blue-collar	41.7%**	47.7%**	51.3%**	51.6%**	20.7%**	29.1%**	33.7%**	36.9%**
Sales/services	40.6%**	50.2%**	49.7%**	50.3%**	24.1%**	31.0%**	33.0%**	39.1%**
Other white-collar	38.8%**	47.5%**	51.4%**	55.2%**	19.8%**	29.3%**	34.6%**	41.7%**
Management	51.0%**	50.1%**	56.8%**	60.2%**	28.9%**	34.1%**	38.8%**	43.5%**
Gender								
Male	47.0%**	54.1%**	55.9%**	58.4%**	26.0%**	35.4%**	37.4%**	43.6%**
Female	37.8%**	45.6%**	48.2%**	49.7%**	19.8%**	27.7%**	32.1%**	37.9%**
Race								
White	42.7%**	50.4%**	53.2%**	55.6%**	22.9%**	31.9%**	35.8%**	41.2%**
African American	34.8%**	41.7%**	43.3%**	43.5%**	19.8%**	26.2%**	27.7%**	36.6%**
Other race	49.3%**	55.6%**	50.7%**	53.5%**	27.7%**	35.4%**	32.7%**	42.3%**
Hispanic origin								
Hispanic	44.3%**	46.1%**	51.5%**	47.0%**	26.3%	31.6%	35.1%	37.0%
Non-Hispanic	42.1%**	50.2%**	52.0%**	54.7%**	22.6%	31.6%	34.7%	41.2%
Education								
High school or less	39.1%**	46.7%**	46.1%**	49.3%**	19.8%**	29.0%**	30.6%**	37.1%**
Some college	44.6%**	51.5%**	54.4%**	55.6%**	24.9%**	32.2%**	36.5%**	43.0%**
College and above	47.9%**	52.7%**	55.9%**	57.4%**	28.0%**	34.3%**	37.4%**	42.6%**
Marital status								
Separated/divorced	50.1%**	58.0%**	54.3%**	54.9%**	29.5%**	39.3%**	39.6%**	42.6%**
Widowed	44.5%**	54.6%**	47.8%**	44.9%**	25.3%**	38.5%**	29.7%**	31.9%**
Never married	41.8%**	48.4%**	55.2%**	52.7%**	23.9%**	33.5%**	40.0%**	47.2%**
Married/partnered	40.6%**	47.8%**	51.4%**	54.2%**	21.3%**	29.3%**	33.3%**	39.8%**
Union status								
Union	36.4%**	38.7%**	43.7%**	49.2%**	16.3%**	22.4%**	23.5%**	34.0%**
Non-union	47.3%**	53.4%**	55.8%**	58.9%**	26.1%**	34.3%**	38.3%**	44.2%**
Pension plan								
No pension	48.7%**	51.8%**	54.2%**	55.9%**	30.5%**	36.8%**	41.0%**	46.9%**
DC	48.3%**	57.4%**	61.3%**	58.9%**	24.0%**	37.1%**	38.4%**	41.2%**
DB	39.1%**	42.4%**	44.1%**	57.9%**	17.5%**	22.6%**	25.3%**	37.1%**
DB+DC	39.8%**	41.3%**	59.3%**	54.3%**	15.7%**	18.7%**	33.0%**	39.8%**
Total household income								
0 to <25% Q1[a,b]	43.2%**	52.9%**	47.5%**	46.9%**	25.0%**	35.5%**	34.5%**	38.9%[a,b]
25% Q1 to < Median	42.4%**	54.7%**	57.1%**	56.9%**	22.8%**	33.3%**	39.3%**	44.6%**
Median to <75% Q3	39.8%**	48.6%**	53.4%**	57.5%**	18.9%**	29.6%**	32.3%**	40.8%**
75% Q3 and above	44.2%**	45.1%**	49.6%**	55.9%**	25.3%**	29.5%**	32.9%**	39.1%**
Total non-housing wealth								
0 to <25% Q1[a,b]	45.7%**	60.2%**	57.6%**	55.5%**	25.9%**	40.3%**	42.2%**	45.1%[a,b]
25% Q1 to < Median	44.8%**	51.1%**	52.1%**	52.9%**	24.9%**	33.6%**	34.0%**	40.4%**
Median to <75% Q3	42.3%**	47.5%**	53.1%**	57.7%**	21.6%**	28.6%**	33.5%**	39.5%**
75% Q3 and above	38.1%**	44.5%**	45.8%**	49.5%**	20.7%**	26.9%**	30.3%**	36.9%**

** Represents statistical significance at 1%.
All percentages were weighted.
[a]Adjusted to 2012 dollars.
[b]Q, Quartile.

TABLE III. Self-Reported Probability of Working Full-Time After Ages 62 and 65 Among Older Workers by Health Indicators

Cohort	P62				P65			
	HRS	WB	EBB	MBB	HRS	WB	EBB	MBB
Birth year	1936–1941	1942–1947	1948–1953	1954–1959	1936–1941	1942–1947	1948–1953	1954–1959
Interview year	1994	2000	2006	2012	1994	2000	2006	2012
Sample size	3,694	2,049	2,382	3,430	3,694	2,049	2,382	3,430
All	42.3%**	49.9%**	52.0%**	53.9%**	22.8%**	31.6%**	34.7%**	40.7%**
Self-reported physical health								
Excellent/very good	45.0%**	52.0%**	53.7%**	58.5%**	24.7%**	33.9%**	35.4%**	43.2%**
Good	41.2%**	45.8%**	54.4%**	53.2%**	21.6%**	26.3%**	36.5%**	40.6%**
Fair/poor	31.8%**	47.7%**	40.8%**	40.8%**	16.4%**	30.5%**	28.9%**	32.5%**
Self-reported mental health (CES-D)								
0	43.7%**	50.0%**	52.9%**	57.5%**	23.7%	31.5%	34.0%	41.6%
1	43.0%**	48.8%**	52.3%**	54.3%**	23.0%	29.9%	35.6%	40.9%
2	36.4%**	48.2%**	51.0%**	57.5%**	17.7%	32.2%	34.2%	42.8%
3–8	38.6%**	51.9%**	49.9%**	43.4%**	21.3%	33.4%	35.8%	37.5%
Number of health conditions								
0	46.5%**	52.7%**	52.0%**	58.7%**	26.3%**	33.6%**	34.6%**	44.0%**
1	39.4%**	47.3%**	55.5%**	56.5%**	21.2%**	29.3%**	37.1%**	42.1%**
2	40.1%**	48.2%**	50.1%**	50.0%**	19.6%**	29.6%**	33.1%**	36.9%**
3–8	36.9%**	50.0%**	44.0%**	45.3%**	17.6%**	34.7%**	30.2%**	36.9%**
Whether health limits work								
Yes	30.6%**	46.4%**	40.8%**	36.4%**	18.2%**	30.4%**	29.4%**	31.7%**
No	44.0%**	50.2%**	53.7%**	57.1%**	23.5%**	31.7%**	35.5%**	42.2%**
BMI								
Normal weight	42.2%*	49.7%*	49.0%*	53.3%*	22.7%	31.3%	33.4%	40.7%
Over weight	43.5%*	50.4%*	54.2%*	55.6%*	23.8%	31.7%	35.4%	41.7%
Obese	40.1%*	50.0%*	52.3%*	52.8%*	20.9%	31.9%	35.2%	39.4%
Smoking status								
Current smoker	43.9%	48.7%	50.5%	52.6%	22.9%	31.3%	35.4%	41.2%
Former smoker	42.8%	50.7%	53.1%	53.2%	23.5%	32.5%	34.9%	40.7%
Never smoker	40.5%	49.8%	51.8%	55.1%	22.0%	30.7%	34.4%	40.5%

* and ** represent statistical significance at 5% and 1%, respectively.
All percentages were weighted.

for the Social Security policy (Model 1), both P62 and P65 show substantial increases in later cohorts when compared to the HRS cohort ($\beta = 14.50$ for P62 and 14.78 for P65 among EBBs, $P < 0.01$; $\beta = 19.06$ for P62 and 19.01 for P65 among MBBs, $P < 0.01$). The changes for Social Security benefits over time are illustrated in Figure 1. Both age of eligibility to receive full Social Security benefits and penalty for early collection of benefits at age 62 increased gradually and in concert. These changes appear not to be associated with workers' retirement expectations. Cohort differences remained significant after controlling for demographics and occupation in Model 2. In general, male workers and those who were unmarried expected to work longer, while black workers and those with a high school or less education were significantly less likely to work at older ages. Although other blue-collar workers tended to retire earlier, no significant difference was found between workers in construction trades and those in management occupations after controlling for demographic factors.

Occupational differences were more distinct after economic measures were considered (Model 3). Work expectations among other blue-collar workers remained significantly lower than management occupations ($\beta = -5.49$ for P62, and -6.44 for P65; $P < 0.01$), while differences between construction trades and management occupations were borderline significant ($\beta = -4.04$ for P62, and -4.57 for P65; $P < 0.05$). Pension coverage was strongly associated with work expectations: workers having DC pension plans were more likely to expect to work full-time past age 62, although less likely to expect to work past age 65 ($P < 0.01$).

TABLE IV. Multivariable OLS Regressions of Probability of Working Full-Time After Ages 62 and 65

| | P62 | | | | | | | | P65 | | | | | | | |
| | Model 1 | | Model 2 | | Model 3 | | Model 4 | | Model 1 | | Model 2 | | Model 3 | | Model 4 | |
Independent variable	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.
Cohort (birth year)																
HRS (1936–1941)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WB (1942–1947)	9.61**	2.98	4.30**	1.44	3.27*	1.39	3.41**	1.34	10.13**	2.54	6.93**	1.24	5.92**	1.13	6.02**	1.10
EBB (1948–1953)	14.50**	3.44	7.88**	1.29	5.90**	1.25	6.22**	1.23	14.78**	3.09	10.73**	1.32	8.79**	1.29	9.02**	1.27
MBB (1954–1959)	19.06**	3.99	11.92**	1.28	8.46**	1.28	8.83**	1.27	19.01**	3.55	17.05**	1.19	13.96**	1.19	14.16**	1.18
Social security age																
65 years	0.00	0.00							0.00	0.00						
65.2–65.8 years	2.81	1.78							1.43	1.64						
66 years	−3.60	3.54							−2.13	2.99						
66.2–66.8 years	−4.53	4.47							0.61	3.91						
Longest occupation																
Construction trades			−2.42	2.14	−4.04*	2.05	−3.86*	2.03			−2.58	2.19	−4.57*	2.19	−4.47*	2.17
Other blue-collar			−3.39*	1.53	−5.49**	1.43	−5.23**	1.48			−4.97**	1.45	−6.44**	1.40	−6.30**	1.42
Sales/services			−1.71	1.55	−3.65*	1.51	−3.37*	1.55			−1.52	1.53	−3.92*	1.49	−3.74*	1.52
Other white-collar			−2.89*	1.37	−3.39*	1.38	−3.44*	1.42			−3.02*	1.24	−2.86*	1.23	−2.94*	1.23
Management			0.00	0.00	0.00	0.00	0.00	0.00			0.00	0.00	0.00	0.00	0.00	0.00
Gender																
Male			8.11**	0.87	8.58**	0.82	8.50**	0.82			6.88**	0.96	7.53**	0.96	7.53**	0.96
Female			0.00	0.00	0.00	0.00	0.00	0.00			0.00	0.00	0.00	0.00	0.00	0.00
Race																
Black			−10.54**	1.18	−12.57**	1.13	−12.59**	1.16			−6.11**	1.21	−7.44**	1.21	−7.31**	1.20
Other			1.66	2.47	0.96	2.41	1.25	2.37			1.13	1.96	0.29	1.96	0.58	1.95
White			0.00	0.00	0.00	0.00	0.00	0.00			0.00	0.00	0.00	0.00	0.00	0.00
Hispanic																
Hispanic			−3.62*	1.86	−5.44**	2.05	−5.22*	2.06			−0.70	2.24	−3.13	2.44	−2.79	2.40
Non-hispanic			0.00	0.00	0.00	0.00	0.00	0.00			0.00	0.00	0.00	0.00	0.00	0.00
Education																
High school or less			−4.81**	1.09	−9.15**	1.31	−8.37**	1.35			−2.85*	1.06	−6.94**	1.08	−7.31**	1.07
Some college			−0.22	1.22	−3.23**	1.23	−2.75*	1.24			0.41	1.10	−2.42*	1.06	−2.16*	1.09
College and above			0.00	0.00	0.00	0.00	0.00	0.00			0.00	0.00	0.00	0.00	0.00	0.00
Marital status																
Separated/divorced			8.55**	1.24	6.63**	1.40	6.50**	1.37			9.12**	1.28	7.28**	1.33	7.17**	1.31
Widowed			6.44**	2.66	5.85*	3.00	5.41	3.02			5.84*	2.63	5.19	2.96	4.82	2.99

(Continued)

TABLE IV. (*Continued*)

Independent variable	P62								P65							
	Model 1		Model 2		Model 3		Model 4		Model 1		Model 2		Model 3		Model 4	
	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.
Never married			2.64	2.47	1.69	2.43	1.74	2.45			8.19**	2.25	7.40**	2.28	7.45**	2.26
Married/partnered			0.00	0.00	0.00	0.00	0.00	0.00			0.00	0.00	0.00	0.00	0.00	0.00
Pension plan																
DB/DB + DC					−7.87**	1.22	−8.34**	1.27					−14.21**	1.15	−14.41**	1.18
DC					2.84*	0.89	2.13*	0.92					−4.09**	1.11	−4.45**	1.11
No pension					0.00	0.00	0.00	0.00					0.00	0.00	0.00	0.00
Total household income[a]																
0 to <25% Q1[b]					0.93	2.01	2.23	2.01					0.43	2.03	1.38	2.03
25% Q1 to <Median					4.60**	1.72	5.25**	1.75					2.93	1.71	3.40*	1.73
Median to <75% Q3					2.74	1.46	2.99*	1.48					0.31	1.34	0.55	1.36
75% Q3 and above					0.00	0.00	0.00	0.00					0.00	0.00	0.00	0.00
Total non-housing wealth[a]																
0 to <25% Q1[b]					14.69**	1.75	15.63**	1.74					12.17**	1.84	12.80**	1.81
25% Q1 to <Median					11.29**	1.61	11.67**	1.62					6.81**	1.62	7.13**	1.62
Median to <75% Q3					7.18**	1.38	7.16**	1.36					3.24**	1.18	3.29**	1.19
75% Q3 and above					0.00	0.00	0.00	0.00					0.00	0.00	0.00	0.00
Self-reported physical health																
Excellent/very good							0.00	0.00							0.00	0.00
Good							−2.48*	1.06							−2.44**	0.84
Fair/poor							−7.79**	1.93							−6.40**	1.85
Health limits work																
Yes							−6.50**	2.12							−2.28	1.68
No							0.00	0.00							0.00	0.00
Number of observations	9,175		9,175		9,175		9,175		8,877		8,877		8,877		8,877	

* and ** represent statistical significance at 5% and 1%, respectively.
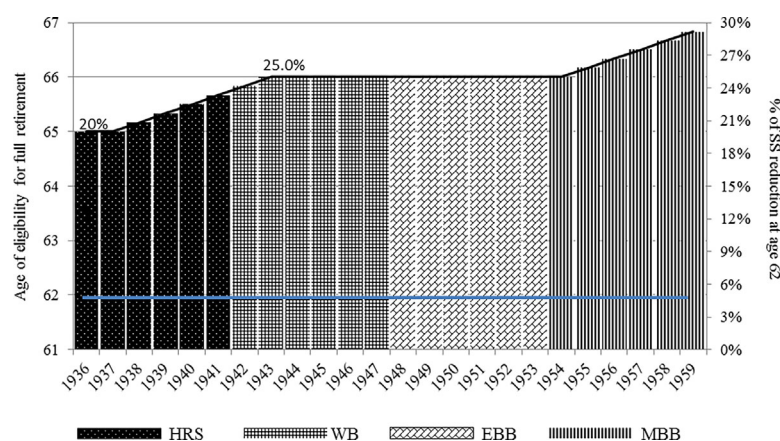[a] Adjusted to 2012 dollars.
[b] Q, Quartile.

FIGURE 1. Age of eligibility and penalty for social security benefit, by age cohort.

Workers having DB pensions (only a few had both DB and DC pensions) expected to work less at older ages compared to those without any pension plans ($P < 0.01$). The amount of non-housing wealth was negatively associated with work expectations among older workers; workers with more wealth had lower work expectations ($P < 0.01$). In contrast to wealth, income was associated with increased P62 only among workers in the second lowest income quartile ($P < 0.01$).

When health status was taken into account in Model 4, significant intergenerational and occupational differences in both P62 and P65 persisted. Respondents in management occupations had higher P62 and P65 than those in any other occupation (other blue-collar workers: β = −5.23 for P62, and −6.30 for P65; $P < 0.01$; construction trades: β = −3.86 for P62, and −4.47 for P65; $P < 0.05$). Workers with self-reported fair or poor physical health were less likely to remain employed past age 62 and age 65 ($P < 0.01$). P62 was significantly lower for workers with work limitations ($P < 0.01$), but the difference was not significant past age 65 when other factors remained constant.

DISCUSSION

This study examined cohort differences in the probabilities of working full-time past ages 62 and 65 among U.S. baby boomers and preceding age cohorts. Compared to the initial HRS cohort born between 1936 and 1941, each succeeding cohort demonstrated an increased self-reported probability of prolonging full-time work past ages 62 and 65. Work expectations remained significantly higher for baby boomers after controlling for major socio-economic factors and health conditions.

Several key factors were related to the differences over time, including shifting traditional DB to DC pension plans, increasing educational attainment, declining marriage rates, and shrinking non-housing wealth among baby boomers. Other factors, such as occupation, gender, race/Hispanic ethnicity, and health status were also independently or jointly associated with work expectations for all older workers regardless of age cohort. However, the changes in Social Security policy were not significantly associated with expectations for prolonging full-time work.

Blue-collar workers in this study demonstrated significantly lower P62 and P65 when compared to those in management occupations. Nevertheless, both P62 and P65 increased among baby boomers with physically demanding jobs. Among workers in construction trades, P62 increased by 37% for MBBs compared to the HRS cohort, while P65 increased from 23.8% for the HRS to 42.9% for MBBs, an 80% increase. Yet, P62 and P65 for construction trades were marginally lower than for those in management occupations after health and wealth factors were considered.

While construction jobs have higher physical demands, construction workers have lower pension coverage than other workers [CPWR, 2013]. These findings suggest that construction workers may continue to work due to financial concerns and only stop working primarily for health reasons. Work in construction and other blue-collar occupations is more physically demanding as well as more hazardous. Sustained work-related illness or injury among workers in those occupations may have long-term negative impact on both self-reported health and income [Dong et al., 2015, 2016]. Risk of more severe outcomes from some injuries, such as fall injuries, also escalates among older workers and older workers may require longer recovery times [CPWR, 2013; U.S. Bureau of Labor Statistics, 2015].

The need for improved work organization, ergonomics, and other safety factors has been extensively documented, and specific interventions to reduce physical stressors among workers in different construction trades have been

demonstrated to reduce back, knee, shoulder, and other symptoms in the short term [Burdorf et al., 2007; Jensen and Friche, 2010; Rempel and Barr, 2015]. Construction companies as well as others have made efforts to accommodate older workers, which is a topic addressed in industry safety bulletins [Aniello, 2008; Welch, 2010; Tishman et al., 2012]. Among the unionized construction trades, a number of practices offer opportunities for older workers to continue productive work. Seniority has always played a role in job placement, so that workers with the most seniority get first choice of job assignments. In fact, many experienced workers move from crafts work to management positions or become skills or safety and health trainers when they are getting older. Examples of more flexible work assignments include an iron worker who may be accommodated by being transferred to a less demanding job such as flag-man (who regulates traffic around road construction) or tool bin clerk (managing tool inventory on a job site). Since more work is becoming mechanized and more structural pieces are being prefabricated in factory-like settings, there are more opportunities for workers to move from hands-on craft work to operational work, such as going from manual welding to operating a welding machine or robot. Life-long learning in the form of skills upgrading is also becoming more common, enabling workers to adapt their skills to their physical capabilities, thus making such career changes possible. However, research demonstrating long-term outcomes from such practices is needed.

In the multivariable regression analyses, both race and ethnicity were important factors. Blacks had significantly lower P62 and P65; Hispanics also had significantly lower P62 and a non-significant reduction in P65. Given that the model takes health, occupation, educational attainment, income, and wealth factors into account, discrimination, or other factors that are not reviewed in this study may contribute to the disparities.

Additional findings of note include the decline in self-reported health status and non-housing wealth among baby boomers cohorts, despite increasing educational attainment. This study also shows large differences in mean and median wealth across all age cohorts, suggesting growing financial inequality over time. While smoking prevalence decreased over time, the increased obesity rates and reduced wealth may be two factors contributing to worsening health among baby boomers. Nevertheless, neither obesity nor smoking alone altered P62 or P65.

While the study suggests that the gradual increase in the age for full Social Security retirement and the increased penalties for retirement at age 62 may not have contributed meaningfully to work expectations, it raises the question about whether these penalties may in fact exacerbate income and consequent health disparities. Prolonged work itself may have cognitive, health, and longevity benefits, in addition to the obvious financial benefit [Wu et al., 2016].

Ideally, those who are near or at retirement age who want to keep working and are able to do so, would have opportunities to work. Those in poor health, or with stressful or physically demanding jobs, would be able to retire or have the option to transition gradually to retirement through part-time or bridge work [McFall et al., 2015]. For example, unionized workers with training and experience currently transition into on-site supervision, safety training and oversight, and apprenticeship training positions; research is needed to determine how to do this effectively and to scale.

This study has several strengths, including a relatively large sample size, nationally representative age cohorts, occupational history data, repeated socioeconomic and health measures over time, and cross-cohort comparisons. In addition, this study used "subjective probabilities" to measure retirement expectations. Previous studies have validated the relationships between subjective probability data and actual outcomes [Hurd & McGarry, 1995; Manski, 2004; Dominitz and Manski, 2005; Hurd, 2009]. Nevertheless, this study has limitations such as inconsistent occupational classifications over time that may have introduced a misclassification bias. Even without the issue of changes in occupational classification, aggregating information across large occupational groupings reduces precision. For example, roofers and carpenters may have a different P62 or P65, but this study was unable to detect the variation among detailed construction trades. Moreover, while self-reported health status is a reliable indicator for what a population experiences in the present time, perceptions of health, sickness, and even disability are highly subjective and complex [Maddox, 1964; Feinberg et al., 1985; Idler, 1993], and could change over time. Therefore, the high number of health conditions among MBBs could be due to changes in diagnostic criteria, improved medical knowledge and diagnostic technology rather than a real change in health status among this age cohort. In brief, although the HRS is a longitudinal survey, the findings are based on self-reported data collected at different time periods, which may be insufficient to detect causal relationships for cohort variations over time. Many factors that could contribute to workers' decisions to work at older ages were either not collected by the survey or not included in the analysis. These include changes in the working environment, workload, individual attitudes toward "working" and "retirement," and social definition of "old," across the study period. Future research on other sociological and psychological factors that are not captured by this study may be needed to better explain how both P62 and 65 have increased over time.

In spite of the limitations, this study confirms the importance of demographic, health, and financial pressures on work expectations over time, and adds new information

about cohort differences. Baby boomers expect to remain at work significantly longer than their predecessors in part due to worsened financial status, despite worse self-reported health. Increased racial and ethnic diversity and income inequality raise concerns about Social Security policies that widen both income and health disparities. At the same time, many workers continue to value the challenges and social aspects of work. Efforts to improve the quality of work, including ergonomic solutions, opportunities for learning and retraining, and flexibility in scheduling to facilitate retirement transitions are urgently needed, particularly for workers in physically demanding occupations such as construction trades.

AUTHORS' CONTRIBUTIONS

Xiuwen Sue Dong: (i) conception and design of the work; (ii) analysis and interpretation of data for the work; (iii) drafting the work and revising it critically for important intellectual content; (iv) final approval of the version to be published; and (v) agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. Xuanwen Wang: (i) the acquisition and analysis of data for the work; (ii) final approval of the version to be published; and (iii) agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. Rosemary Sokas: (i) drafting the work and revising it critically for important intellectual content; (ii) final approval of the version to be published; and (iii) agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. Knut Ringen: (i) revising it critically for important intellectual content; (ii) final approval of the version to be published; and (iii) agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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DISCLOSURE (AUTHORS)

The authors report no conflicts of interest.

DISCLOSURE BY AJIM EDITOR OF RECORD

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DISCLAIMER

The findings and conclusions in this report are those of the author(s) and do not necessarily represent the views of the National Institute for Occupational Safety and Health.

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