

Self-Assessed Retirement Outcomes:
Determinants and Pathways

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Abstract

There is increasing interest among policy makers in measuring well-being in ways that go beyond purely economic indicators, also with special focus on older individuals who constitute an increasing fraction of the population. However there is little consensus on which other indicators should be included. An alternative approach is to use individuals' own assessments and relate these to a rich set of covariates to find what factors influence individuals' own perceptions. This is the approach adopted in this paper, using data from the Health and Retirement Study (HRS). Retired respondents are asked how satisfying their retirement has turned out to be, how retirement years compare to pre-retirement years and whether they are worried about not having enough income to get by in retirement. I relate these self-assessed measures to a rich set of covariates to investigate which aspects weigh in individuals' perceptions. I use the longitudinal nature of the HRS to study the pathways that lead up to the observed retirement outcomes, and to examine the persistence of the outcomes over time. Bad health, changes towards worse health, social isolation and increase in social isolation lead most significantly to lower satisfaction in retirement and a greater sense of financial insecurity in retirement. A short financial planning horizon and past shocks, like unexpected large expenses or divorce, also have a noticeable negative impact.

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1. Introduction

The ultimate goal of government policies is to improve the well-being of the people under its jurisdiction. Welfare policy focuses on securing a basic level of economic well-being, as it is designed to keep people above the poverty line. However, there are many other dimensions that affect individuals' quality of life, such as health, the environment they live in, activities and social and familial relationships. A National Academy of Sciences report on "Preparing for an Aging World" (2001) emphasizes in its recommendations the importance of studying well-being to develop consensus about measurement, but also to help gather facts about the well-being of older individuals, in particular, in view of the aging of the population. The publications of the Federal Interagency Forum on Aging-Related Statistics (2000, 2004) which compiles key indicators of well-being of older Americans speak to this need. It presents 37 key-indicators covering a wide array of topics such as demographics, living arrangements, economic status, health, and residential services. The National Academy of Sciences report also draws attention to retirement which for most people is a very abrupt transition out of employment and stands in contrast to the gradual aging process. It could affect well-being in a positive way, but for some it may be associated with hardship.

This paper uses data from the Health and Retirement Study (HRS), a large nationally representative survey of the U.S. population age 51 and above, to find the well-being of those who recently retired. To measure well-being I rely on respondents' self-assessments of how retirement turned out, how it compares to the years prior to retirement and whether respondents are worried about having enough income to get by. The HRS has very rich information from many life domains which I use to contrast the characteristics of those who express dissatisfaction with their situation in retirement with the characteristics of those who are content. Whether policies could avert the unfavorable outcomes observed for some 10 to 25 percent of the retirees

depends on the pathways that preceded these outcomes. The longitudinal nature of the HRS allows investigating some possible pathways and their relative importance. It also allows following retirees over time as they progress in their retirement to find whether the unfavorable outcomes experienced at the beginning of retirement persist or whether there is recovery.

To the extent that respondents' self-assessments of well-being in retirement are heavily influenced by their economic circumstances the measures may be good indicators of the adequacy of people's retirement resources. There is an extensive economics literature concerned with this issue employing different methods for assessing the adequacy of resources. A recurring finding of this literature is that some non-negligible fraction of the population reaches retirement with insufficient resources. The estimates of how large this group is range between 20 and 50 percent. The studies by Engen, Gale and Ucello (1999) and by Scholz, Sheshardri and Khitatrakun (2004) are examples for estimates at the lower end of the spectrum, while Moore and Mitchell (2000) find this group to be substantially larger. Even the low estimates represent a substantial number reaching retirement with inadequate resources and the magnitude is similar to the fraction of the population expressing dissatisfaction with their retirement situation.

To the extent that other factors weigh heavily in respondents' own evaluations this study investigates a comprehensive utility measure of retirement outcomes that is not restricted to a financial assessment. Relating the self-assessments to a rich set of covariates I show below that, even though important, economic conditions are not the only factor entering respondents' evaluations.

A few other recent studies have used some of the same measures of retirement satisfaction from the same data set. Bender (2004) and Bender and Jivan (2005) present associations of the retirement satisfaction variables with a number of covariates such as age, pension type, source of health insurance, labor force status, and whether retirement was forced or

voluntary. Panis (2003) investigates to what extent annuities, that is, largely risk-free retirement income, enhance retirement satisfaction. He finds that retirees who receive a larger portion of their income from defined benefit pensions are more satisfied, even though there seems to be no such effect observed for Social Security income. All three studies restrict their analysis to retirement outcomes observed in HRS 2000. This cross-sectional approach has some important limitations. It compares retirement satisfaction across individuals who differ in when and at what age retirement occurred, which may confound or bias the importance of some of the correlations. Inferences about how retirement satisfaction evolves as people spend more time in retirement are not reliable when derived from cross-section.

This paper takes a very different approach to analyzing these data: starting with a limited age-cohort of the HRS which has been observed in their 50s at baseline in 1992, I follow respondents as they leave the labor force and find the first report on retirement satisfaction which reflects well-being at the beginning of retirement. I investigate what factors respondents seem to take into account when assessing their well-being using a large set of covariates going beyond basic demographics, economic resources and health measures, but also including proxies for environmental and social factors. Health appears to be the strongest determinant of how individuals evaluate their retirement outcomes, followed by economic factors such as income and wealth. Social isolation as measured by feeling lonely shows associations of similar magnitude as, for example, being in the lowest income quartile.

To think of policies that might help prevent people from experiencing distress at retirement raises questions about the pathways. Did those in poor health experience a health shock that lead to their retirement or have they had health problems for some time already? Were those with low economic resources simply poor planners or did they experience some unexpected events that affected their savings? I use the panel structure of the HRS to find

answers to these questions. In some cases, I use retrospective information to capture events that occurred before the beginning of the survey period. Overall health appears to have the strongest impact on retirement outcomes, directly, but also indirectly by reducing lifetime resources for individuals who had to retire earlier due to poor health. Social isolation, both before retirement and also increased social isolation coinciding with retirement, reaches similar magnitudes. Also events that occurred further in the past such as divorce or unexpected large expenses impact retirement outcomes noticeably, and so does a short financial planning horizon.

Another question of interest is how retirement outcomes evolve over time as retirement progresses and whether there is recovery from unfavorable outcomes experienced at the outset of retirement. Examining the transitions over time I find that retirement outcomes are fairly persistent; however, unfavorable outcomes are less persistent than favorable outcomes, suggesting that there is some recovery.

The analysis focuses on unfavorable outcomes; for example, I present the effects associated with being not at all satisfied with retirement. The reason for adopting this view is that the primary concern of policy makers is to avert adverse outcomes or to alleviate these. It is to understand who the people are for whom retirement did not turn out well, how they got there and how persistent those outcomes are. The findings may inform policy makers in devising measures that will reduce the fraction of the population experiencing retirement in distress. Of course, the bad outcomes are not studied independently, but they are compared to the characteristics and the circumstances of those for whom retirement turned out well.

2. Data

The data come from the Health and Retirement Study (HRS), a biennial survey of the U.S. population age 51 and over. At baseline in 1992 the HRS interviewed a random sample of 51 to 61 year olds and their spouses; several other cohorts were added over time. The original HRS cohort, which is the focus of this study, has now been observed for 7 waves spanning twelve years so that in the latest available wave (HRS-2004) even the youngest respondents of the original HRS cohort have reached age 63. As a result for the vast majority we observe their transition into retirement.

The variables of primary interest in this study are three subjective assessments of well-being in retirement, measured in the HRS as how retirement has turned out overall, how retirement years compare to years directly before retirement, and whether the person is worried about having enough income in retirement to get by. These come from the employment section of the HRS questionnaire and the exact wording goes as follows:

Retirement satisfaction:

All in all, would you say that your retirement has turned out to be very satisfying, moderately satisfying, or not at all satisfying?

Retirement years compared to pre-retirement years:

Thinking about your retirement years compared to the years just before you retired, would you say the retirement years have been better, about the same, or not as good?¹

Worried about not having enough income to get by [in retirement]:

*Now for things that some people say are bad about retirement.
(If retired)*

Please tell me if, during your retirement, they have bothered you a lot, somewhat, a little, or not at all.

(If not retired)

Please tell me if they worry you a lot, somewhat, a little, or not at all.

¹ One of the coded answers may be "retired less than a year ago". In that case we use the answer to the same question reported in the next wave of HRS.

[...]
Not having enough income to get by.
*Does this bother you a lot, somewhat, a little, or not at all?*²

The question about retirement satisfaction and the one about the comparison of retirement years follow the same skip patterns: they are only asked if in a preceding question the respondent reported to be completely retired.³ Repeated observations over time are available if an individual reports being completely retired in more than one wave. For example, if somebody retired and remains retired from then on, HRS will ask these questions every two years. The skip pattern for the question on worries about income in retirement is substantially more complex, because it changed over time. The main thing to note is that from HRS wave 4 (1998) onward the question is only asked of respondents who are new entrants to the survey.

2.1. Analytical Sample

The objectives of this study are to observe self-assessed retirement outcomes at the beginning of retirement, investigating pathways that lead up to those outcomes and finding how the self-assessments of retirement change over time. To that effect I use data from all seven HRS waves from 1992 through 2004 and find respondents' self-assessments immediately following their retirement. Let the wave to which this report pertains be wave t and arrange all prior and all subsequent observations of the individual with reference to t . Information about the individual collected prior to t enters the analysis of the pathways. Observations on retirement outcomes from $t+1$, $t+2$, and so forth form the basis of the analysis of how these retirement outcomes evolve over time. The implementation of this strategy needs to address several practical issues.

² One possible additional answer category is that the respondent did not work.

³ The routing question about retirement status asks "At this time do you consider yourself to be completely retired, partly retired, or not retired at all?" "Question irrelevant" is an additional answer category for those who consider themselves as not in the labor force like homemakers, for example.

Selection. Starting with the HRS age-eligible cohort that was age 51-61 in 1992, some fraction of the population has not retired by 2004, the last available wave of the survey. To the extent that individuals who retire at younger ages are different from those who retire at older ages it could introduce selection into our sample. The most prominent retirement ages in the U.S. are age 62 and age 65. Restricting the analytical sample to those HRS respondents who were at least 53 in 1992 ensures that even the youngest will have reached age 65 by the year 2004. While this strategy does not completely eliminate the possibility of selection, it should reduce its effect substantially.⁴

Definition of retirement. Even though there are many possible ways of defining retirement the choice is limited in the context of the variables of interest because two of the three retirement outcomes are only asked if the respondent considers him or herself as being completely retired. Therefore, this is the definition I adopt. I use the first available report on retirement outcomes and select for the analytical sample only those who retired recently, excluding those who have been retired for four or more years at the time of first report.⁵

Return to work. After classifying themselves as completely retired in one wave some respondents report themselves as partly retired or not retired in a later wave. Returning to work is likely to be an indicator for retirement not having turned out too well for the individual. I use the report on retirement outcomes pertaining to the first retirement, but use the information that the individual returned to work as a covariate in some of the analysis.

Defined in this way the analytical sample has

⁴ There are 7,618 respondents of the original HRS cohort who were age 53 to 61 in 1992. Of these, about 9 percent report in 2004 to be “not retired.” Only 4.3 percent report themselves as “not retired” in all waves.

⁵ This would be the case if the person was already retired at baseline in 1992, in which case we only use those observations where the respondent reported having retired less than four years ago. Another scenario would be that the person did not respond to one or more prior waves or did not answer the question either on retirement status or on retirement outcomes. For every first report on retirement outcomes I check with other information in the survey whether the person retired less than four years ago.

- 3,495 observations for retirement satisfaction of which 21 percent return to work in a later wave;
- 3,325 observations on individuals' comparison of retirement years to pre-retirement years with 20 percent of them reporting return to work in a later wave; and
- 1,314 observations on worries about enough retirement income among which 28.6 percent return to work at a later date.

The number of observations for the last outcome is substantially smaller due to the skip patterns which determined that from wave 4 (1998) forward the question would only be asked of new entrants to the survey.⁶

To verify that the resulting samples are representative I compare their characteristics to those of the population from which each one of them is drawn, that is the sample of HRS respondents age 53-61 at baseline. Table 1 shows the summary statistics from the baseline (1992) for each of the three sub-samples (columns 2 through 4) next to the same summary statistics for the HRS (column 1). Whether comparing age, gender, marital status, education, mean income or mean wealth there are no noticeable differences between the analytical samples for the three retirement outcomes and the random sample of baseline HRS respondents. The distributions of self-rated health show small differences with the samples of retirement satisfaction and the one on comparison of retirement years being slightly more healthy (only 21 percent in fair or poor health versus 24 percent in the reference sample in column 1); while the

⁶ The skip patterns for this variable changed repeatedly: in the first wave the question was only asked of those reporting themselves as completely retired; in the second wave everybody who responded to the question about current retirement status was asked; the third wave asked only those who were not retired in wave 2 irrespective of their answer to retirement status in wave 3 and also those who were retired in wave 2 but not retired or only partly retired in wave 3. From wave 4 onward only new entrants to the survey were asked the question. As a result the analytical sample for "worried about having enough retirement income" that consists of reports collected at the time of retirement can only come from waves 1 through 3 and thus is much smaller than for the other two retirement outcomes.

sample on worries about retirement income is slightly less healthy (31 percent in fair or poor health versus 24 percent in the reference sample). Median income is a little higher in columns (2) and (3) compared to column (1); and median wealth is also slightly higher in the three analytical samples compared to the reference. All in all, this comparison shows that the analytical samples are closely comparable to the reference sample of HRS respondents age 53-61 at baseline.

2.2. Distribution of Retirement Outcomes

As a first step I establish how respondents evaluate their retirement shortly after they have transited into being completely retired. About half assess their retirement to have turned out very well by all three criteria. As Table 2 shows, 57 percent state to be very satisfied with their retirement overall, 50 percent perceive their retirement years as being better than the years just before retirement and 46 percent are not at all worried about not having enough income to get by in retirement. However, at the other end of the spectrum there are 11 percent who experience their retirement as not at all satisfying, 18 percent think their retirement years are worse and as many as 24 percent worry a lot about not having enough income to get by. It is the group with these less favorable outcomes that forms the focus of this study.

All three measures are strongly correlated as can be seen from Tables 3 through 5: those very satisfied with their retirement predominantly (71 percent) rate retirement years to be better than pre-retirement years and most are not at all worried about not having enough income to get by (68 percent). Conversely those who are not at all satisfied with their retirement many feel that retirement years are not as good as the years just before retirement (80 percent), and 73 percent of them worry a lot about having sufficient income to get by. Similarly, 61 percent of those who rate their retirement years as not as good also worry a lot about having enough income to get by.

3. What do self-assessed retirement outcomes measure?

Because the retirement outcomes reflect individuals' personal assessments of their situation it is hard to know *a priori* which factors enter these self-assessments. Are they mostly economic or health related or do other factors play an important role as well? To find out I use the rich information available in the HRS. Table 6 shows cross-tabulations for retirement satisfaction and how it varies by individual and household characteristics measured at the same time as the retirement outcome itself which is shortly after the individual became completely retired. The statistics are shown separately for those who remain retired and those who return to work at a later time during the survey period to see whether there are more severe signs of distress among those who return to work.

Focusing first on the patterns observed among those who remain retired one finds that those who are not at all satisfied with their overall retirement situation retired earlier, have lower education levels and they are more likely to be single, to be in worse health (higher fraction (i) in fair/poor health, (ii) with at least one ADL-limitation, (iii) with at least one IADL-limitation), and to have a spouse in poor health if married. Economic factors are clearly important: both mean and median household income is about half for those not at all satisfied; mean (median) wealth is one third (fourth) that of satisfied people. There are also differences in the composition of income with those not at all satisfied with retirement deriving a smaller fraction of their income from pension and annuities while income from SSI and disability benefits is more important for this group. Looking at the role of family relationships, those not at all satisfied with retirement are more likely to not have any living children; but there is not much variation by whether the person has any living siblings. Factors of individuals' immediate physical environment may also play a role in their experience of retirement. Indeed, respondents with low satisfaction are more likely to report to live in a neighborhood with fair or poor safety.

Comparing the patterns among those who remain retired with those who return to work at a later date, I find qualitatively the same patterns, only that the latter group retired even earlier (on average by about a year for the not satisfied; 1.5 years for the satisfied sub-sample). The differences between the satisfied and not satisfied are more marked among those who return to work: even though this group has higher income on average and also at the median compared to those who remain retired, the sub-group of the not satisfied respondents has even lower income than the not satisfied who do not return to work. The same observation holds for wealth at the median which is one sixth that of the satisfied individuals who return to work and lower than the dissatisfied who do not return to work.

In summary, health and economic status show strong associations with retirement satisfaction, and also environmental and social factors seem to play a role. The findings are similar (not shown) when conducting the same exercise for the other retirement outcomes (pre-/post retirement comparison and worry about sufficient income).

Of course several ones of the characteristics included in Table 6 are correlated with economic status. To find which factors persist when controlling for all the covariates jointly I estimate a logit model with the left-hand variable taking the value one if the respondent is not at all satisfied with retirement and zero otherwise. The set of right-hand variables includes most of the variables considered also in the cross-tabulations, plus a proxy for social isolation (whether the person felt lonely much of the time during the week prior to the interview). I perform the same type of estimation also for the other two retirement outcomes. Table 7 presents the results.

Demographics. The age bands reflect the individual's age when he or she reported the self-assessed retirement outcome, which is a proxy for the age at which the individual became

completely retired.⁷ Early retirement, that is, before reaching age 62, increases the chances of unfavorable retirement outcomes across all three models. As has been shown in prior research, such as Zissimopoulos, Panis and Hurd (2002), early retirement is often associated with poor health and low levels of resources. Therefore, the effect of early retirement is particularly strong in the estimation of worries about sufficient income to get by (model 3), where those retiring in their 50s are ten times as likely to have such worries compared to those retiring at age 64 or later. Being married enhances well-being in retirement significantly for all retirement outcomes, but its effect is strongest again for model 3, capturing the fact that in a couple there is another person who could help earning some money. Education has no independent effect once economic status and health are controlled for.

Economic Status. Income and wealth, entered as quartiles in the estimations, show strong gradients, cutting the likelihood of the individual experiencing retirement in a negative way by up to 55 percent; this effect is similar for all three well-being measures (see highest income and highest wealth quartiles), but the effect is strongest for worries about income in retirement which corresponds most closely to a measure of an economic outcome.⁸

Health. For the more general well-being measures health has by far the strongest effect compared with any other covariates. Individuals who rate their health as fair or poor are eight times more likely to be not at all satisfied with retirement and they are four times more likely to feel that their retirement years are “not as good.” Self-rated health also has a strong effect for worries about income in retirement with those in fair or poor health being three times more likely to worry a lot, but it is not the most important covariate as it is dominated by the effect of early

⁷ The age at the HRS interview differs from the age at retirement, but because the timing of the interview is independent of the timing of retirement, it is a valid proxy for the age at retirement.

⁸ Wealth and income quartiles are defined for singles and married separately. To account for the fact that income and wealth at retirement is observed in different years for different individuals I first adjust all amounts by the CPI to express them in 2004-dollars and then compute the quartiles over all singles in the respective analytical samples for the three retirement outcomes and then over all couples in the respective analytical samples.

retirement. Interestingly, for this outcome variable the spouse being in fair or poor self-rated health is significant whereas for the other outcomes it is not, stressing the importance of risk pooling in a couple: if one had to retire then there is always the other person who could still contribute to the economic well-being of the household. But if that other person is in poor health this may no longer be an option and economic worries are aggravated. The effects of ADLs and IADLs on self-assessed retirement outcomes are similar to those of self-rated health: for the respondent retirement is less enjoyable (models 1 and 2) when suffering from ADLs or IADLs. Whether the spouse has any IADLs affects both the respondent's enjoyment of retirement (models 1 and 2) and the respondent's peace of mind regarding the economic well-being of the household. It increases the chances of an adverse retirement outcome by about 60 to 70 percent. Whether the spouse has any ADLs has qualitatively similar effects, only that they are not significant in the estimation. The effect of the spouse having any ADLs or IADLs on the respondent's worries about sufficient income likely follows the same logic described above of reducing the possibility of pooling economic risks in a couple.

Social and Familial Support. Family and other relationship can contribute in important ways to well-being in retirement, both at the emotional level as well as at the economic level. But how important are they in people's personal evaluation of retirement compared to other factors? As proxies for the familial relationships and possible support I have included the number of living children and the number of living siblings. While the descriptive statistics earlier showed some association between these variables and self-assessed retirement outcomes, these associations are not significant in a multivariate context, with the one exception of having siblings reducing the chances by about 25 percent of experiencing retirement as worse the pre-retirement.^{9,10} The indicator for feeling lonely much of the time (last week) is included to

⁹ This effect is significant at the 10 percent level (P-value = 0.065).

capture whether the individual lacks personal relationships and social support more generally. It shows a very strong relationship with adverse retirement outcomes, increasing the chances of an unfavorable outcome in any one of the three models by a factor ranging between 2.2 and 2.5.

The safety of the neighborhood has no independent effect in the multivariate setting.

All in all health appears to be the strongest determinant of how individuals evaluate their retirement outcomes, followed by economic factors such as income and wealth. Social isolation as measured by feeling lonely shows associations of similar magnitude as, for example, being in the lowest income quartile.

4. Pathways

There are many pathways that might lead to unfavorable retirement outcomes. To inform policy makers whether there is room for policy interventions that could prevent or alleviate at least some adverse outcomes and hence increase individuals' well-being in retirement one first needs to know what these pathways are. Unexpected events could play an important role. For example, the HRS asks respondents whether over the last 20 years they had any large unexpected expenses. 37 percent of those age 53 to 61 in 1992 respond yes to this question.¹¹ While there are government programs to help with some unexpected events, such as job loss or disability, for most unexpected negative shocks the individual is on his or her own or needs to rely on help from family or friends. Family formation and dissolution may not be unexpected in the short-run, but is very hard to plan for in the long run. Over the course of the life-cycle it determines whether a person can take advantage of returns-to-scale in consumption while married, making it

¹⁰ Also when including the interaction between being married and having any children there is no significant effect and the estimated magnitude is offset by the independent effects of having a child and being married.

¹¹ This statistic combines responses to the question from HRS 1992 about unexpected large expenses over the last 20 years and a similar question from HRS 1994 which asked whether any unexpected expenses occurred since the last interview in 1992.

easier to accumulate resources, or whether the person has to contribute economic resources to two households due to a prior divorce, which would make it more difficult to accumulate resources for retirement. Somebody who plans ahead may be able to accommodate unexpected events with less hardship than somebody who does not engage much in advance planning. To investigate the importance of these pathways directly requires going back in time and obtaining information about respondents' situation prior to retirement. Using the longitudinal nature of the HRS data I investigate the circumstances under which the individual retired, in particular what were important reasons for the individual's retirement and whether it coincided with changes in health. Retrospective information on marital history and large unexpected expenses incurred in the past also enter the analysis. I estimate a logit model for each one of the three retirement outcomes of interest, with the left-hand variable taking the value one if the respondent reports an unfavorable outcome at retirement (e.g., not at all satisfied; retirement years are worse; or worried a lot about not having enough income to get by). Right-hand variables include demographics such as age, gender, marital status, education, whether the individual has any children, or any living siblings, and the safety of the neighborhood. In addition, the right-hand variables include a set of covariates that address a number of possible pathways, such as transitions in health, lack or gain of social networks, lack of planning, marital history, unexpected events, disability and reasons for retirement. I provide details of the exact specification of each of these covariates when discussing the results. These are presented in Table 8.

Health. To investigate the role of health I include the respondent's self-rated health at $t-1$, where $t-1$ refers to the wave before the respondent is first observed to be completely retired; the change of the respondent's health between $t-1$ and t ; and whether poor health was an important reason for retirement. In interpreting the results these variables need to be considered

jointly. Being in fair or poor health already before retirement clearly impacts the overall well-being in retirement in that it more than doubles the risk of being not at all satisfied in retirement and also the risk to experience retirement years as worse than the years before retirement. If health deteriorated by the time the person retired the risk is increased yet again by a factor of 1.6 (model 1) to 1.8 (model 2).

The effect of self-rated health at $t-1$ and its change does not show a significant effect for worries about not having enough income. The reason is that for this outcome the mechanism of health leading the respondent to be more worried is best captured by the variable whether poor health was an important reason for retirement. When an individual is forced to retire due to poor health this usually implies that the individual retires earlier than planned resulting in a loss of expected lifetime resources which would translate into worries about economic resources in retirement. Respondents who stated that poor health was a very important reason for retirement are almost five times as likely to be worried a lot about not having enough income to get by. For retirement satisfaction and for the pre-/post retirement comparison the effect of retiring due to poor health is strong, but not quite as strong (odds ratio of 2.8 and 2.6, respectively). This is plausible because retiring due to poor health does not translate as directly into low retirement satisfaction or into retirement years being worse.

Whether a person ever applied for disability benefits captures potentially more severe health problems, some of which may have affected the individual's health trajectory for a longer period of time. This variable approximately doubles the risk of an unfavorable outcome across all self-assessed measures of retirement over and above the effects of the other health variables also used in estimation. Interestingly, including the indicator for "ever applied for disability benefits" affects the estimates associated with early retirement (age bands less than 59 and 59 to 61): they become insignificant in models 1 and 2 and in model 3 their magnitude is reduced

substantially. This is because one important pathway to retiring early is receiving disability benefits.

Reasons for retirement. I already discussed the role of poor health as an important reason for retirement in the context of the health variables. For individuals who state that wanting to do other things and wanting to spend more time with family were important reasons for their retirement, one would anticipate that retirement was something that these individuals were looking forward to and that they would enjoy high levels of well-being. This is exactly what is implied by the results: they are about half as likely to be dissatisfied with retirement and about half as likely to feel that retirement years are worse than pre-retirement years.

Lack of planning. At baseline in 1992 all HRS respondents are asked for their financial planning horizon, whether it covers next month, next year, next few years, and so on. I use an indicator for “short financial planning horizon” for those who answered next month or next year. This group is 50 percent more likely to be not at all satisfied with retirement and to be worried a lot about not having enough income to get by in retirement. Their chances to compare their retirement years unfavorably to their pre-retirement years are also increased by 30 percent. To identify respondents who have not made any specific retirement plans even close to the event itself I use information from the question about respondents’ retirement plans observed at $t-1$, the wave before they are observed completely retired. About 10 percent state even that close to retirement that they have not thought much about it. However, the indicator variable for this characteristic is not significant in any of the estimations.

Social Network. A person’s social network can change substantially at retirement with the daily contact to co-workers ceasing on the one hand and with the additional time for pursuing personal contacts on the other hand. As a proxy for social networks I use the information

whether the person felt lonely much of last week, measured at $t-1$, and the change in this variable between $t-1$ and t . Respondents' social network measured in this way has a very large effect on all three retirement outcomes. Loneliness at $t-1$ triples the chances of not being at all satisfied with retirement at t ; it makes respondents 2.5 times as likely to experience their retirement years as not as good. The effect for worries about retirement income is even larger in magnitude, but the estimate falls just short of being significant at the 10 percent level. For those who become lonely in retirement the likelihood is again increased by a factor of 2 to 2.4.

Retrospective information. The HRS has retrospective information on respondents' marital history. The number of divorces has a significant effect on overall retirement satisfaction and on material well-being in retirement. Being divorced twice or more almost doubles chances of being worried about retirement income.

Another powerful piece of retrospective information is whether the respondent incurred some unexpected large expenses over the last 20 years which has a strongly significant effect in all three models. It increases the likelihood of adverse outcomes by about 50 percent for both retirement satisfaction and for the pre-/post retirement comparison. The chances are double for the economic measure of well-being in retirement; that is, having experienced some large unexpected expenses over the last 20 years makes a respondent twice as likely to be worried a lot about not having enough income to get by in retirement.

Overall health appears to have the strongest impact on retirement outcomes, directly, but also indirectly by reducing lifetime resources for individuals who had to retire earlier due to poor health. Social isolation, both before retirement and also increased social isolation coinciding with retirement, reaches similar magnitudes. Also events that occurred further in the past such as divorce or unexpected large expenses impact retirement outcomes noticeably, and so does a short financial planning horizon.

5. Retirement Satisfaction as Retirement Progresses

When somebody at the beginning of his or her retirement experiences unfavorable retirement outcomes one might ask whether that person is likely to recover from that state because the individual's situation might improve or possibly because the individual gets used to the situation over time. At the same time, those for whom retirement turned out well initially may experience declines. Tables 9 through 12 show the transitions in retirement satisfaction and retirement year comparisons between the first wave in retirement t and the next wave $t+1$, and also for $t+1$ and $t+2$.¹² Focusing first on the transitions between t and $t+1$ one finds that good outcomes are more persistent than "bad" outcomes and that moderate outcomes are more likely to change into good outcomes. Another important observation is that at this early stage of retirement many respondents return to work and so they are no longer asked the questions about retirement outcomes: while all respondents classified themselves as completely retired at t about 18 percent consider themselves either partly or not retired at $t+1$. The fraction returning to work is somewhat lower among those who are very satisfied in retirement, but not by much compared to the other categories (lower by about 5 percentage points). This is evidence for retirement happening gradually across all groups. When looking at the same transitions for $t+1$ and $t+2$ there is much less transitioning back to work (about 10 percent). By $t+1$ respondents have been retired for about 3 years on average so that for this group retirement has become a more permanent state. The retirement outcomes have become more persistent by this time, so that among those who were very satisfied with retirement at $t+1$ about 78 percent were also satisfied in $t+2$. The corresponding number for those not at all satisfied is 49 percent.

¹² Due to the many changes in skip patterns for the variable measuring worries about not having enough income to get by, there are not sufficient repeated observations to study transitions over time.

6. Conclusions

There is little consensus on how to measure well-being in a way that is more comprehensive than economic indicators. In this paper I use individuals' own assessments from the HRS and relate these to a rich set of covariates to find what factors influence individuals' own perceptions.

Retired respondents are asked how satisfying their retirement has turned out to be, how retirement years compare to pre-retirement years and whether they are worried about not having enough income to get by in retirement. All three outcomes are heavily influenced by respondents' health and economic status, but social interactions play a role as well. To answer the question of which pathways were important to produce the observed retirement outcomes I use the longitudinal nature of the HRS. Not surprisingly bad health, changes towards worse health, social isolation and increase in social isolation are the most important channels even when conditioning on age, education and a few other demographic characteristics. However, other mechanisms are at play too: having gone through divorce some time in the past and unexpected large expenses and having applied for disability benefits are important (and significant) as well. People with a short planning horizon (a year or less) also tend to attain less favorable retirement outcomes. As retirement progresses retirement outcomes are fairly persistent, however, unfavorable outcomes less so than favorable outcomes.

Table 1: Comparison of baseline characteristics in 1992 of HRS sample restricted to age 53-61 and the analytical samples pertaining to the three retirement outcome variables

	(1) HRS-cohort Age 53-61 in 1992	(2) Analytical sample: retirement satisfaction	(3) Analytical sample: ret./pre-retirement comparison	(4) Analytical sample: worried about retirement income
<i>N</i>	7,618	3,495	3,325	1,314
Age	56.8	57.1	57.1	57.8
Female (%)	52.9	52.4	52.5	52.1
Married/partnered (%)	76.0	76.6	76.8	75.0
Education (%)				
Less th. high school	27.9	24.5	24.5	27.3
High school &GED	38.2	40.4	40.6	41.3
Some college	18.0	18.5	18.4	15.3
College or more	15.9	16.6	16.6	16.1
Self-rated health (%)				
Excellent/very good	47.7	49.4	49.1	42.2
Good	28.6	30.0	30.1	26.4
Fair/poor	23.7	20.6	20.8	31.4
Income [thousand \$]				
Mean	45.0	47.4	47.6	43.2
Median	34.0	39.0	39.0	33.4
Wealth [thousand \$]				
Mean	216.1	215.3	215.7	212.7
Median	94.0	105.5	106.0	115.8

Source: Author's calculations.

Table 2: Retirement outcomes and their distribution in the respective analytical samples

Outcome Variable	Response Categories	N	Distribution
Retirement satisfaction	1. Very satisfying	1,995	57.1
	2. Moderately satisfying	1,127	32.2
	3. Not at all satisfying	373	10.7
	<i>All</i>	<i>3,495</i>	<i>100.0</i>
Pre-/post retirement comparison	1. Better	1,656	49.8
	3. About the same	1,058	31.8
	5. Not as good	611	18.4
	<i>All</i>	<i>3,325</i>	<i>100.0</i>
Worries about not having enough income to get by [in retirement]	1. A lot	318	24.2
	2. Somewhat	194	14.8
	3. A little	203	15.4
	4. Not at all	599	45.6
	<i>All</i>	<i>1,314</i>	<i>100.0</i>

Table 3: Association between retirement satisfaction and pre-/post retirement comparison (N=3,322)

Retirement satisfaction	Pre-/post retirement comparison			All
	better	about the same	not as good	
Very	70.7	27.1	2.3	100.0
Moderately	26.5	46.2	27.3	100.0
not at all	6.7	13.6	79.8	100.0
All	49.8	31.8	18.4	100.0

Table 4: Association between retirement satisfaction and worry about retirement income (N=1,157)

Retirement satisfaction	Worried about not having enough income to get by				All
	a lot	somewhat	a little	not at all	
Very	6.2	8.7	16.8	68.3	100.0
Moderately	27.7	22.2	17.0	33.2	100.0
not at all	72.5	12.4	7.9	7.3	100.0
All	23.5	13.7	15.5	47.3	100.0

Table 5: Association between pre-/post retirement comparison and worry about retirement income (N=1,119)

Pre-/post retirement comparison	Worried about not having enough income to get by				All
	a lot	somewhat	a little	not at all	
better	8.8	10.3	14.5	66.4	100.0
about the same	16.3	18.7	19.9	45.2	100.0
not as good	60.8	15.6	11.0	12.6	100.0
All	23.2	14.0	15.3	47.5	100.0

Table 6: Retirement Satisfaction by individual characteristics, measured shortly after retirement (cont.)

	Remains retired (N=2,753)			Returns to work (N=742)		
	Very or moderately satisfied	Not at all satisfied	All	Very or moderately satisfied	Not at all satisfied	All
Age	62.7	60.9	62.5	61.3	59.8	61.2
Female						
yes	88.8	11.2	100.0	88.6	11.4	100.0
no	89.7	10.3	100.0	90.9	9.1	100.0
Married/Partnered						
yes	91.5	8.5	100.0	92.8	7.2	100.0
no	83.3	16.7	100.0	81.2	18.8	100.0
Education						
less than highschool	82.2	17.8	100.0	82.3	17.7	100.0
highschool/GED	89.6	10.4	100.0	91.0	9.0	100.0
some college	92.6	7.4	100.0	90.9	9.1	100.0
college or more	95.1	4.9	100.0	94.8	5.2	100.0
Self-rated Health						
excellent/very good	98.2	1.8	100.0	96.5	3.5	100.0
good	93.7	6.3	100.0	94.0	6.1	100.0
fair/poor	73.4	26.6	100.0	68.0	32.1	100.0
ADLs						
none	92.2	7.8	100.0	92.7	7.3	100.0
one or more	68.3	31.7	100.0	56.7	43.3	100.0
IADLs						
none	91.3	8.7	100.0	90.5	9.5	100.0
one or more	64.2	35.8	100.0	76.7	23.3	100.0
<i>Spouse's health:</i>						
Self-rated Health (Sp)						
excellent/very good	92.8	7.2	100.0	96.0	4.0	100.0
good	95.2	4.8	100.0	92.2	7.8	100.0
fair/poor	84.4	15.6	100.0	87.6	12.4	100.0
ADLs (Sp)						
none	92.7	7.3	100.0	94.0	6.0	100.0
one or more	82.8	17.2	100.0	85.7	14.3	100.0
IADLs (Sp)						
none	92.8	7.2	100.0	95.0	5.0	100.0
one or more	80.2	19.9	100.0	75.0	25.0	100.0

Table 6: Retirement Satisfaction by individual characteristics, measured shortly after retirement

	Remains retired (N=2,753)			Returns to work (N=742)		
	Very or moderately satisfied	Not at all satisfied	All	Very or moderately satisfied	Not at all satisfied	All
Income [\$2004, thousand]						
mean	61.8	35.2	58.9	67.3	34.3	63.9
median	44.7	20.0	41.6	52.3	17.3	48.6
Income composition (% of total)						
Social Security	25.4	20.0	24.8	16.6	18.2	16.8
Pension and Annuities	17.1	7.5	16.0	16.1	7.3	15.2
Asset income	12.2	9.6	11.9	15.0	6.9	14.2
Earnings	33.6	29.0	33.1	42.4	29.6	41.1
SSI/Disability	4.4	19.9	6.1	2.9	19.0	4.5
Wealth [\$2004, thousand]						
mean	416.1	145.6	387.0	402.3	182.4	379.8
median	216.6	48.9	192.7	194.2	32.0	170.6
Number of living children						
None	83.3	16.7	100.0	75.7	24.3	100.0
1	89.7	10.3	100.0	89.7	10.3	100.0
2	89.4	10.6	100.0	92.6	7.4	100.0
3 or more	89.3	10.7	100.0	89.9	10.1	100.0
Number of living siblings						
None	89.7	10.4	100.0	86.6	13.4	100.0
1	91.8	8.2	100.0	91.5	8.5	100.0
2	88.9	11.1	100.0	92.6	7.4	100.0
3 or more	87.9	12.1	100.0	88.9	11.1	100.0
Safety of neighborhood						
Excellent/very good	93.2	6.8	100.0	92.4	7.7	100.0
Good	88.7	11.3	100.0	91.1	8.9	100.0
Fair/poor	78.8	21.3	100.0	83.0	17.0	100.0

Table 7: Multivariate description of retirement outcomes as a function of characteristics at retirement (continued on next page)

	(1) Retirement satisfaction		(2) Pre-/post retirement comparison		(3) Worried about income	
	Probability of being “not at all satisfied” Mean = 0.107		Probability of retirement years being worse Mean = 0.184		Probability of being “worried a lot” Mean = 0.242	
	Odds-Ratio	P-value	Odds-Ratio	P-value	Odds-Ratio	P-value
<i>Age band</i>						
less than 59	2.33	0.001	1.34	0.138	10.30	0.008
59-61	2.18	0.001	1.26	0.167	7.27	0.024
62-63	0.86	0.525	0.79	0.161	4.00	0.114
64-65	0.74	0.234	0.69	0.034		
66 or more	(ref)	--	(ref)	--	(ref)*	--
Female	1.00	0.977	1.02	0.858	1.11	0.547
Married/partnered	0.61	0.006	0.67	0.006	0.26	0.000
<i>Education</i>						
Less than HS	0.75	0.059	0.90	0.400	1.11	0.579
HS & GED	(ref)	--	(ref)	--	(ref)	--
some college	1.01	0.971	1.02	0.900	0.73	0.240
College or more	1.02	0.928	0.73	0.113	0.86	0.617
Returns to work	1.28	0.122	1.28	0.060	1.22	0.269
<i>Wealth quartiles</i>						
Lowest	(ref)	--	(ref)	--	(ref)	--
Second	0.94	0.686	0.93	0.593	0.57	0.007
Third	0.61	0.019	0.60	0.002	0.47	0.002
Highest	0.65	0.081	0.53	0.001	0.31	0.000
<i>Income quartiles</i>						
Lowest	(ref)	--	(ref)	--	(ref)	--
Second	1.12	0.463	0.90	0.455	1.18	0.417
Third	0.64	0.024	0.73	0.041	0.75	0.224
Highest	0.53	0.008	0.67	0.023	0.47	0.008
<i>Respondent's health</i>						
<i>Self-rated health</i>						
excellent/very good	(ref)	--	(ref)	--	(ref)	--
Good	2.58	0.000	1.85	0.000	0.90	0.654
fair/poor	8.04	0.000	4.03	0.000	3.06	0.000
any ADL	1.99	0.000	2.29	0.000	1.79	0.008
any IADL	1.55	0.019	1.98	0.000	0.96	0.841

*The top age bands were combined in this estimation.

Table 7: Multivariate description of retirement outcomes as a function of characteristics at retirement (continued from previous page)

	(1)		(2)		(3)	
	Retirement satisfaction		Pre-/post retirement comparison		Worried about income	
	Probability of being “not at all satisfied” Mean = 0.107		Probability of retirement years being worse Mean = 0.184		Probability of being “worried a lot” Mean = 0.242	
	Odds-Ratio	P-value	Odds-Ratio	P-value	Odds-Ratio	P-value
<i>Spouse's health</i>						
Self-rated health						
excellent/very good	(ref)	--	(ref)	--	(ref)	--
Good	0.57	0.011	0.99	0.971	1.05	0.856
fair/poor	1.02	0.928	1.01	0.967	1.74	0.034
any ADL	1.31	0.289	1.13	0.557	1.44	0.319
any IADL	1.56	0.076	1.59	0.028	1.71	0.063
any children	0.80	0.368	0.88	0.561	0.87	0.615
any sibling	0.75	0.131	0.75	0.064	0.97	0.898
Neighborhood safety						
excellent/very good	(ref)	--	(ref)	--	(ref)	--
Good	0.92	0.621	1.05	0.719	0.68	0.140
Fair/poor	1.27	0.239	1.07	0.701	0.96	0.882
Feeling lonely	2.49	0.000	2.17	0.000	2.37	0.000

Table 8: Pathways to unfavorable retirement outcomes (continued on next page)

	(1)		(2)		(3)	
	Retirement satisfaction		Pre-/post retirement comparison		Worried about income	
	Probability of being “not at all satisfied” Mean = 0.107		Probability of retirement years being worse Mean = 0.184		Probability of being “worried a lot” Mean = 0.242	
	Odds-Ratio	P-value	Odds-Ratio	P-value	Odds-Ratio	P-value
Age band						
less than 59	1.37	0.234	0.85	0.443	6.23	0.043
59-61	1.24	0.365	0.81	0.240	4.58	0.091
62-63	0.72	0.162	0.71	0.049	3.74	0.144
64-65	0.75	0.258	0.67	0.024		
66 or more	(ref)	--	(ref)	--	(ref)*	--
Female	1.09	0.515	1.08	0.510	1.29	0.151
Married/partnered	0.80	0.140	0.93	0.577	0.45	0.000
Education						
Less than HS	0.95	0.731	1.09	0.497	1.38	0.093
HS & GED	(ref)	--	(ref)	--	(ref)	--
some college	0.94	0.750	0.94	0.677	0.65	0.125
College or more	0.84	0.463	0.65	0.023	0.74	0.300
Any children	0.73	0.199	0.92	0.709	1.05	0.862
Any siblings	0.86	0.430	0.84	0.267	0.86	0.553
Neighborhood safety						
Excellent/very good	(ref)	--	(ref)	--	(ref)	--
Good	0.96	0.826	1.09	0.547	0.85	0.541
Fair/poor	1.35	0.146	1.11	0.548	1.27	0.423
Self-rated health at <i>t-1</i>						
Excellent/very good	(ref)	--	(ref)	--	(ref)	--
Good	1.56	0.050	1.80	0.000	1.02	0.951
Fair/poor	2.14	0.002	2.68	0.000	1.60	0.149
Health change (<i>t-1</i> to <i>t</i>)						
Health deteriorated	1.59	0.059	1.80	0.002	0.86	0.662
No change	(ref)	--	(ref)	--	(ref)	--
Health improved	0.73	0.138	0.68	0.015	1.35	0.316
<i>Reasons for Retirement:</i>						
<i>[x] was very important</i>						
Poor health	2.79	0.000	2.62	0.000	4.73	0.000
Do other things	0.45	0.000	0.57	0.000	0.69	0.130
Spend time with family	0.71	0.097	0.55	0.000	1.55	0.176
Not much thought about retirement at <i>t-1</i>	1.28	0.255	1.14	0.475	1.03	0.936
Short financial planning horizon	1.54	0.002	1.28	0.035	1.52	0.018

*The top age bands were combined in this estimation.

Table 8: Pathways to unfavorable retirement outcomes (continued from previous page)

	(1) Retirement satisfaction		(2) Pre-/post retirement comparison		(3) Worried about income	
	Probability of being “not at all satisfied” Mean = 0.107		Probability of retirement years being worse Mean = 0.184		Probability of being “worried a lot” Mean = 0.242	
	Odds-Ratio	P-value	Odds-Ratio	P-value	Odds- Ratio	P-value
Loneliness at <i>t-1</i>	3.02	0.000	2.53	0.000	4.48	0.119
Loneliness change						
Not lonely anymore	0.45	0.016	0.56	0.032	0.20	0.164
No change	(ref)	--	(ref)	--	(ref)	--
Become lonely	2.44	0.000	2.25	0.000	1.91	0.027
Number of divorces						
Never divorced	(ref)	--	(ref)	--	(ref)	--
Once	1.34	0.053	1.20	0.145	1.12	0.573
Twice or more	1.45	0.080	1.10	0.614	1.77	0.053
Any unexpected large expenditures	1.46	0.004	1.46	0.000	1.88	0.000
Ever applied for disability	2.27	0.000	2.04	0.000	2.25	0.000

Table 9: Transitions in retirement satisfaction between t and $t+1$

		Retirement satisfaction one wave after first report (t+1)			Return to work (i.e., not retired/ partly retired)	All
		very	moderately	not at all		
Retirement satisfaction at first report (t)	very	68.7	14.7	1.4	15.2	100.0
	moderately	25.8	46.2	8.6	19.3	100.0
	not at all	7.9	33.9	38.6	19.6	100.0

(N = 3,270)

Table 10: Transitions in respondents' ratings pre-/post retirement comparison between t and $t+1$

		Pre-/post retirement comparison one wave after first report (t+1)			Return to work (i.e., not retired/ partly retired)	All
		better	same	good		
Pre-/post retirement comparison at first report (t)	better	61.5	19.6	4.3	14.5	100.0
	about same	30.9	37.4	11.0	20.7	100.0
	not as good	15.0	21.6	46.2	17.2	100.0

N = 2,985

Table 11: Transitions in retirement satisfaction between $t+1$ and $t+2$

		Retirement satisfaction two waves after first report (t+2)			Return to work (i.e., not retired/ partly retired)	All
		very	moderately	not at all		
Retirement satisfaction one wave after first report (t+1)	very	77.6	13.2	1.0	8.2	100.0
	moderately	25.1	58.2	6.5	10.2	100.0
	not at all	7.1	37.1	48.6	7.1	100.0

(N=1,801)

Table 12: Transitions in respondents' ratings pre-/post retirement comparison between $t+1$ and $t+2$

		Pre-/post retirement comparison one wave after first report (t+2)			Return to work (i.e., not retired/ partly retired)	All
		better	same	good		
Pre-/post retirement comparison at $t+1$	better	67.9	18.7	3.3	10.2	100.0
	about same	32.1	44.6	13.5	9.8	100.0
	not as good	12.4	23.1	53.8	10.7	100.0

N = 1,421

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