Jeff Dominitz

A Comparison of Subjective Expectations Elicitation Methods in the Health and Retirement Study, the Panel Study of Income Dynamics, and the Survey of Economic Expectations

No. 96-043

HRS/AHEAD Working Paper Series
July 1996

The Health and Retirement Study (HRS) and the **Study of Asset and Health Dynamics Among the Oldest Old (AHEAD)** are nationally representative longitudinal data collections begun in the early 1990s that examine retirement and the aging of society. The two studies are administered at the Institute for Social Research at the University of Michigan. Both studies involve the collaborative efforts of researchers from around the country, and both are supported by funding (U01 AG09740 and U01 AG12980) from the National Institute on Aging at NIH, with supplemental funding for one or both studies from the Social Security Administration, the Department of Labor Pension and Welfare Benefits Administration, the Office of the Assistant Secretary for Planning and Evaluation at DHHS, the State of Florida Department of Elder Affairs, the NIH Office of Research on Minority Health, and the NIH Office of Research on Women's Health. For information about the studies, visit the HRS/AHEAD Web site: http://www.umich.edu/~hrswww/

A cooperative agreement between
the Institute for Social Research
at the University of Michigan and
the National Institute on Aging

HRS the Health and Retirement Study — AHEAD Asset and Health Dynamics Among the Oldest Old

A Comparison of Subjective Expectations Elicitation Methods in the Health and Retirement Study, the Panel Study of Income Dynamics, and the Survey of Economic Expectations

Abstract: This paper examines subjective expectations data collected by three different (United States) national surveys which utilize varying methods of subjective probability elicitation. The results of the analysis contribute to the accumulating body of evidence that researchers who wish to obtain direct reports of an individual's expectations can and should elicit subjective probabilities rather than adopt more traditional survey methods for eliciting expectations. Using the Health and Retirement Study wave 2 survey data to build on previous findings validating the wave 1 expectations data, I find that reported expectations are stable over time, despite what appears to be a substantial change in the question format. Analysis of subjective probability data collected in the Panel Study of Income Dynamics and the Survey of Economic Expectations reveals that data quality may be further enhanced by revising the questions asked of survey respondents.

Data used: Health and Retirement Study: U.S., 1992 (first wave) and 1994 (second wave) // Panel Study of Income Dynamics (PSID): U.S., 1994 // Survey of Economic Expectations: U.S., 1994

About the Authors

Jeff Dominitz is a Research Fellow at the Institute for Social Research and the Population Studies Center at the University of Michigan.

Acknowledgments

This paper was prepared for the HRS Wave 2 Early Results Workshop at the Institute for Social Research in Ann Arbor, Michigan, October, 1995.

1. Introduction

National surveys regularly elicit the respondent's expectations of future outcomes. Unlike many others, the Health and Retirement Study survey elicits quantitative responses in the form of subjective probabilities. Analyses of expectations data collected in wave 1 (HRS:1) yielded positive findings on their validity. Retirement and survival expectations, for example, were generally found to be internally consistent, to aggregate to sensible population probabilities, and to vary with observable individual characteristics in accordance with variation observed in data on retirement and survival realizations. See, for example, Honig (1995) and Hurd and McGarry (1993). In this paper, I use the wave 2 (HRS:2) data to extend this line of research in several directions.

Previous analyses focussed on expectations of whether or not an event would occur, such as working full-time after age 62 or living past age 75. Rather than "yes/no" responses, HRS:1 respondents reported the likelihood that the event will occur by choosing an integer from 0 to 10, where "0" was said to mean "absolutely no chance" and "10" was said to mean "absolutely certain." Researchers have divided responses by 10 and interpreted them as subjective probabilities. In HRS:2, however, the response scale was changed to the interval [0,100], where the chosen value was meant to explicitly correspond to the "percent chance" that the event will occur. By comparing the empirical distributions of responses to these questions, we may discern the effect of this change.

During the same calendar year in which HRS:2 was conducted, similar expectations questions were asked in two other national surveys, the 1994 editions of the Panel Study of Income Dynamics (PSID) and the Survey of Economic Expectations (SEE). These questions were prefaced with different introductory material intended to improve data quality by familiarizing respondents with the concept of percent chance. I therefore supplement the analysis by comparing the distributions of HRS expectations to distributions of PSID and SEE expectations.

The HRS also elicited quantitative, point expectations of the year of retirement (e.g., "At what age do you plan to stop working?"). Researchers typically interpret the response to this type of question as the mean of the subjective probability distribution. See, for example, the analysis of Retirement History Survey data on expected social security benefits in Bernheim (1990). It is worth considering the usefulness of eliciting expectations in this manner as opposed to eliciting subjective probabilities.

The paper is organized as follows. Section 2 presents some issues facing those who wish to design expectations survey questions and describes approaches adopted in the HRS and elsewhere. In Section 3, I compare HRS:1 and HRS:2 responses to assess the effects of changes in question format on the cross-sectional distribution of responses. If responses are not too sensitive to these changes, as seems to be the case here, then we would hope to see some stability of responses over time. I evaluate stability by studying the distribution of HRS:2 responses conditional on HRS:1 responses. Section 4 compares responses to HRS questions with responses to PSID and SEE questions, as does Section 5, which examines the extent to which individuals give responses indicative of an inability to articulate subjective probabilities. The analysis concludes in Section 6 with a comparison of subjective probabilities and loosely elicited point expectations of events with continuous outcomes. Conclusions are given in Section 7.

2. Eliciting Subjective Expectations

2.1. Expectations of Events with Binary Outcomes

Suppose we wish to learn a respondent's expectations concerning the loss of his or her job during the next 12 months. Historically, surveys have elicited expectations of events with binary outcomes by asking the respondent to report a "yes/no" expectation (e.g., "Do you expect to lose your job? yes or no"), with other acceptable response categories either implicit or explicit (e.g., "maybe" and "don't know").

Juster (1966) argued that more information could be obtained by asking the respondent to report the probability that the event will occur. The argument rests on the observation that, in the case of binary variables, a respondent's expectations are fully described by the subjective probability. To answer "yes/no" expectations questions, the respondent may need to determine whether or not this probability exceeds some threshold value, answering "yes" if it does and "no" if it does not. In the process, we lose information. Savage (1971) also recognized this problem and concluded that "Yes, No or Maybe is Not Enough."

Manski (1990) builds the case for eliciting subjective probabilities by investigating the information content of "yes/no" expectations. Even in a best-case scenario in which all respondents have rational expectations and use the same threshold value and in which the researcher knows this value, we can only bound the theoretical relationship between expectations and realizations. Researchers who analyze "yes/no" expectations data, and who often find that the respondents do not forecast realizations very well, typically overlook this inherent limitation of the data.

Once the decision has been made to elicit subjective probabilities, we must decide how to formulate the survey question. The HRS:1 format follows from questions included in the experimental supplement to the July 1964 Quarterly Survey of Intentions, in which respondents were given an 11-point scale from 0 to 10. Juster (1966) found that these responses predicted purchases more efficiently than did "yes/no" purchase intentions.

Alternatively, the 1993 Survey of Economic Expectations allowed respondents to choose any value from the interval [0,100] (see, for example, Dominitz and Manski, 1996). In addition to allowing a greater range of responses, the values correspond to an actual cardinal scale. As such, phrases such as "percent chance" and "chances out of 100" may be invoked to yield greater comprehension of the scale and to therefore improve interpersonal comparability of responses. This response scale and the "percent chance" terminology were subsequently adopted in HRS:2 and in the 1994 PSID expectations module.

2.2. Expectations of Events with Continuous Outcomes

Suppose now we wish to learn a respondent's expectations of his or her age of retirement. Expectations of events with a continuum of possible outcomes are inherently more difficult to elicit. Traditional efforts typically elicit point expectations by simply asking when the respondent "expects to" or "plans to" retire. In fact, the HRS adopted this format to elicit expectations of the age of stopping work or reducing work hours and expectations of the level of social security benefits. Researchers are then left to determine how to interpret such a response. Is it the mean of the subjective probability distribution? Or perhaps the median? Or the mode? Moreover, is this choice common across respondents?

An alternative approach taken in the HRS would transform the continuous variable "age of retirement" into a series of binary variables--"retired by age 62," "retired by age 65," and so forth--and elicit expectations of these variables. These expectations are fully described by the corresponding subjective probabilities.

The difficult task then becomes choosing the threshold values about which to ask. As such, the problem parallels that of choosing the thresholds for "bracketing questions" faced elsewhere in the HRS (and discussed in this workshop). See, for example, Heeringa et al. (1995). To resolve this issue, the survey designer must consider how researchers will wish to use the data, what is known or may be assumed about the subjective distribution, and, of course, the time costs. For example, will researchers only be interested in locating the central tendency, or will they be equally interested in the spread of the distribution? Will the most useful threshold values be common across respondents or will they vary greatly? What are the costs and benefits of including more threshold values?

In the case of retirement (actually, "working full-time"), the HRS employed two threshold values, ages 62 and 65. This choice must have been based on the fact that these are the most prevalent ages of retirement observed in past survey data on retirement age realizations.

In other cases, the rationale may not be as easily inferred. For example, the SEE elicits household income expectations by choosing up to six different threshold values for each household, where the values are selected after the respondent reports the "highest possible" and "lowest possible" incomes. The questions are tailored to span the support of the respondent's subjective distribution, therefore yielding more information about the shape of this distribution than would the same number of questions asked about a narrower or wider range of thresholds (Dominitz and Manski, 1996). These responses have been used to fit household-specific subjective distributions.

2.3. The Survey Questions

The expectations data studied here come from three sources--the Health and Retirement Study, the Panel Study of Income Dynamics, and the Survey of Economic Expectations. While each data set is derived from a national probability sample of households, these surveys have very different sample selection procedures. Where possible, an effort is made to increase comparability. Specifically, results are presented in which PSID and SEE samples are restricted to respondents aged 50 to 61 in order to better match the HRS sample. The appendix presents the exact wording of questions of interest. Where helpful, these questions are also described in some detail below.

The analysis focusses on responses to questions useful in studying the retirement decision. The HRS:1, HRS:2, and 1994 PSID expectations data concern survival, retirement, and job prospects. The 1994 SEE data concern job prospects.

The first probability question asked of a (currently-employed) HRS:1 respondent was the following:

> On a scale from 0 to 10 where 0 equals absolutely no chance and 10 equals absolutely certain, how likely is it that you will lose your job during the next year?

A graphical representation of the choice set {00, 01, 02, ...,10} was shown to respondents to this face-to-face interview. Subsequent work-related expectations questions followed immediately thereafter. Other sets of expectations questions (e.g., survival expectations) were inserted in other sections of the survey.

In HRS:2, all subjective probability questions were included in one section of the survey (Section C), which was administered via telephone. This module of questions was prefaced by the following text:

> Now I am going to ask you about the chance of various events happening to you. Please answer the questions in terms of percent chance. Percent chance must be a number from 0 to 100, where "0" means there is absolutely no chance, and "100" means that it is absolutely certain.

> Let's start with the weather. Weather forecasters often say something like, "There's a 10-20 percent chance of rain tomorrow," meaning there's not much chance that it will rain. Using the same idea, what do you think the chances are that it will be sunny tomorrow?

The other expectations questions followed. Respondents were occasionally prompted with "On this same 0 to 100 scale" or "Now using the same scale as before where '0' is absolutely no chance and '100' means that it is absolutely certain."

The 1994 PSID and 1994 SEE expectations question modules were each prefaced by a longer series of instructional text and were each administered via telephone. The PSID questions were all included in the final section of the survey. The introduction read as follows:

> Now I would like to ask you about the chance of various events happening to you. Please answer the questions in terms of percent chance. Percent chance must be a number from 0 to 100, where "0" means there is <u>absolutely no chance</u> and "100" means that it is <u>absolutely certain</u>. For instance, phrases like...
>
> > "not much chance" may be around 15 or 20 percent,
> > "an even chance" may be around 45 or 55 percent, and
> > "almost certain" may be around 95 or 98 percent.
>
> Let's start with the weather. What do you think are the chances that it will be sunny tomorrow? ("0" means a zero chance of sunny weather, "100" means a 100 percent chance, and you may say any number from 0 to 100).

Finally, the SEE includes the most extensive set of instructions in its module of expectations questions. The questions are prefaced by the following instructions:

> Now I will ask you some questions about future, uncertain outcomes. In each case, try to think about the whole range of possible outcomes and think about how likely they are to occur during the next 12 months.
>
> In some of the questions, I will ask you for the PERCENT CHANCE of something happening. The percent chance must be a number from 0 to 100.
> Numbers like:
>
> > 2 or 5 percent may be "almost no chance"
> > 20 percent or so may mean "not much chance"
> > a 45 or 55 percent chance may be a "pretty even chance"
> > 80 percent or so may mean a "very good chance"
> > and a 95 or 98 percent chance may be "almost certain"
>
> The percent chance can also be thought of as the NUMBER OF CHANCES OUT OF 100. Now I will begin asking the questions. Let's start with the weather where you live.
>
> What do you think is the PERCENT CHANCE (what are the CHANCES OUT OF 100)

that it will rain tomorrow?

Subsequent questions adopted the "PERCENT CHANCE (what are the CHANCES OUT OF 100)" option for interviewers. At any time, the interviewer could call up a help screen to restate much of the instructional material. Interviewers were trained to probe for responses, encouraging respondents to give the "best estimate."

3. HRS Expectations Data: Waves 1 and 2

This section begins the analysis of HRS:1 and HRS:2 expectations data. Tables 1, 2, and 3 present the frequency distribution of responses to each of six subjective probability questions--living past ages 75 and 85, working full-time after ages 62 and 65, losing your job during the next year, and finding an equally good job conditional on losing your job this month. Responses to similar PSID and SEE questions, analyzed in Sections 4 and 5, are also described in these tables.

To ease comparability of responses across questions and interviews, I restrict the sample of HRS respondents in two ways. Probabilities of living past ages 75 and 85 are included if the individual reported these probabilities in both HRS:1 and HRS:2, yielding a sample of 7681 respondents. The work-related probabilities are included if the individual reported each of these four probabilities, yielding of sample of 4808 respondents who were employed both in HRS:1 and in HRS:2. In all cases, respondents must have been born after 1932 (i.e., no more than 61 years old in HRS:2).

It is difficult to concisely summarize any comparison of responses to this series of six HRS expectations questions, each asked in wave 1 and in wave 2. What is most striking about the frequency distributions presented in Tables 1 thru 3 must be the apparent similarity between wave 1 and wave 2 responses, even in the presence of a change in response scale. Entries at round numbers are bold-faced to highlight the frequency of HRS:2 responses equal to such values. HRS:1 responses necessarily take on only these values. Only a small proportion of HRS:2 responses are not rounded off to the nearest 10 percent chance. The highest frequency of responses at other values occurs for the probability of living until age 85, for which 17 percent of HRS:2 respondents choose such values (i.e., values which could not have been chosen in HRS:1). The lowest frequency occurs for the probability of working after age 65 (10 percent).

The next set of tables makes the comparison of distributions somewhat easier by presenting quantiles of each empirical distribution. Consider the first two rows of panel 4A (Table 4), which describes the distribution of probabilities of living until age 75. Four of the five empirical quantiles are identical across waves, with the exception differing by only 0.01. The first two rows of each of the subsequent panels (4B, 5A, 5B, 6A, and 6B) present similar comparisons. Of the 25 pairs of reported quantiles, 19 are identical, 5 pairs differ by 0.10, and the other pair differs by 0.20.

We may anticipate some distributions to change more than others. For example, in the absence of some major medical breakthrough or catastrophe, the distribution of survival expectations should not change much between waves 1 and 2. On the other hand, variation over the business cycle may lead to changes in the distribution of job loss probabilities. Looking at the tables, however, we see that only the reported probabilities of living past age 85 (and perhaps working full-time after age 65) exhibit a systematic pattern of change over time. The 0.25-, 0.50-, and 0.75-quantiles each decreases by 0.10 between HRS:1 and HRS:2 (panel 4B). In contrast, four of the five pairs of job loss probability quantiles are identical (panel 6A), as are all five quantiles describing the distribution of probabilities of finding an equally good job (panel 6B). It is worth noting that Hurd and McGarry (1993) found the sample mean subjective probability of living until age 75 was close to the life table probability, but that of living until age 85 exceeded the life table probability. This systematic decrease in the latter probabilities should therefore bring them more in line with the life table probability.

These tables yield no evidence that the change in response scale had a substantial impact on the distribution of responses, but for the greater range of valid responses. To extend this analysis, one could re-estimate the conditional means and linear regressions presented by Hurd and McGarry (1993), using the cross-sectional HRS:2 data instead of the HRS:1 data. If the response scale makes no difference and the population relationships are stationary, then duplicate results would be produced, but for sampling error.

At this point, however, I choose to focus on the stability of the individual's responses over time rather than on the stability of these population relationships over time. The evidence on this subject is also presented in Tables 4 thru 6, which describe the distribution of HRS:2 responses conditional on the corresponding response in HRS:1. Consider the empirical quantiles of P[p2|p1=p*] the conditional distribution of the HRS:2 probability p2 given that the corresponding HRS:1 probability p1 equals some value p*. If responses were perfectly stable, then these conditional quantiles would each equal p*. That is, the conditional distribution would be degenerate at p*. We do anticipate, however, that expectations would actually change over time, so responses would not be perfectly stable and this evaluation should not be taken as a "reliability test" of survey responses. Instead, the goal is to assess the extent to which the expectations are reasonably stable and to determine whether or not the patterns of stability across questions conform to our priors.

The tables clearly indicate that responses are not perfectly stable but do seem reasonably stable. Consider first the empirical conditional medians (0.50-quantiles). Given the likelihood of measurement error in the reported probabilities, we would anticipate evidence of "median reversion." (The more commonly-used concept of mean reversion is less useful here, because the variable is bounded from above and below). If there were complete median reversion, the conditional median would equal the unconditional median (reported in the second row of each table). If there were no reversion, then the conditional median of P[p1|p2=p*] would equal p*. The data do exhibit median reversion in almost all cases, but the problem is not severe (i.e, the conditional median is typically much closer to the conditioning value p* than to the unconditional median). Moreover, the conditional quantiles almost always (weakly) increase as the conditioning value increases, a further indication of stability. Fully 280 out of 300 possible times do the reported conditional quantiles (weakly) increase when p* increases.

Now consider how the conditional distributions vary across questions. Relative to the probability of living until age 85, we would anticipate the probability of job loss during the next year to be much less stable. After all, many people will be on different jobs (especially those who reported high job loss probabilities in HRS:1), and some jobs will have become more secure while others have become less secure. Focussing on the conditional medians, it is evident that the data bear out this relationship. As the conditioning value (HRS:1 probability p*) increases, the conditional median of the HRS:2 job loss probability increases from 0.00 (at p*=0.0) to just 0.30 (at p*=0.7) and then decreases. Recalling that the overall distribution of job loss probability responses remained stable, it appears the respondents swapped places within the distribution. On the other hand, with respect to probabilities of living to 85, the ordering of respondents appears more stable in the presence of a slightly downward drift of the unconditional distribution.

Consider now the distribution of full-time work probabilities. As age 62 approaches, we may anticipate that responses will become more concentrated at the limiting values 0.0 and 1.0, while we may not anticipate such a marked trend with respect to age 85 survival probabilities. This pattern is apparent in the spread of the conditional distribution (e.g., the distance between the 0.10- and 0.90-quantiles). Note that the 10-90 spread is everywhere greater for the conditional probabilities of working full-time after age 62 than for the conditional probabilities of living until age 85. Meanwhile, the degree of median reversion is no greater. Thus, the greater "median-preserving spread" of the conditional distribution of full-time work probabilities indicates that these expectations were less stable, as anticipated.

These findings on stability should be reassuring to researchers interested in using the subjective probability data in the HRS. A useful extension of this analysis would attempt to identify unanticipated events which cause individuals to revise expectations, as in Anderson et al. (1986) and Bernheim (1990). Identifying an unanticipated event is typically a daunting task, once one recognizes that individuals form expectations over a whole series of events. Formally, one may view an unanticipated event as one to which the individual assigned a subjective probability of 0.0, just as a fully anticipated event is one to which the individual assigned a subjective probability of 1.0. Clearly, most outcomes fall in the continuum of partially anticipated events (i.e., outcomes with prior subjective probabilities within the open unit interval). Knowing the prior probabilities is therefore crucial to understanding the effects of some realized outcome on revisions of subjective expectations of other future outcomes. Given its extensive series of probabilistic expectations questions, the HRS panel offers an excellent source of data for this type of analysis, which I leave as a topic for future research.

4. HRS, PSID, and SEE Expectations Data

Recall the instructions given to HRS:1 and HRS:2 respondents. Despite being offered a greater range of values--values which correspond directly to the percent chance scale,--HRS:2 respondents overwhelmingly reported multiples of 10. It should be noted, however, that only multiples of 10 were explicitly included in the instructions. Perhaps the more extensive instructions given to PSID and SEE respondents would yield different results.

To make such a comparison, I study PSID and SEE responses given to expectations questions also included in the HRS. The frequency distributions are reported in Tables 1 thru 3. In each case, I describe the expectations reported by PSID or SEE respondents aged 50 to 61. In some cases, I also present the distribution over all respondents. Empirical quantiles of these unconditional distributions are also presented in Tables 4 thru 6.

As was previously noted, no fewer than 83 percent and no greater than 90 percent of HRS:2 respondents reported a multiple of 10 (henceforth, "rounded value") for any of the six subjective probability questions. Among the 50 to 61 year-old PSID (PSID:50-61) respondents, the proportions decrease. A maximum of 82 percent reported rounded values (probability of working full-time after age 65) and a minimum of 73 percent did so (probability of living until age 85 and probability of finding an equally good job). Other than the decreased use of rounded values, the distributions of PSID:50-61 responses appear rather similar to the HRS:2 distribution. The probabilities of living until age 75 do tend to be lower among PSID:50-61 respondents. One may speculate that this difference arises out of the greater degree of over-sampling of low-income households in the 1994 PSID relative to HRS:2.

The SEE only offers comparisons of the job prospects responses. Taking first the probability of job loss during the next 12 months, 75 percent of respondents aged 50 to 61 (SEE:50-61) reported rounded values, as opposed to 81 percent of PSID:50-61 respondents and 90 percent of HRS:2 respondents. Most noticeable are reports of a 1 to 4 percent chance. Twelve percent of SEE:50-61 respondents gave these values, while 2 percent of PSID:50-61 and 2 percent of HRS:2 respondents did so. The distinction between a zero and a non-zero subjective probability of such an adverse outcome may be thought to be important. See, for example, economic research on precautionary saving (Carroll, 1992) and psychological research on vulnerability (Quadrel et al., 1993).

The less frequent reports of rounded values by SEE respondents can be explored further by studying data from the entire sample of individuals below age 62. This distribution may be compared with the distribution of PSID responses. Consider again the probability of job loss. In the full sample, only 70 percent of SEE responses were rounded values, as opposed to 79 percent of PSID responses. The smaller proportions of rounded values found in these full samples can be attributed to the smaller proportions of zeros (relative to the proportions in the age 50-61 samples). The upward shift of the unconditional distribution of job loss probabilities, evident from a comparison of quantiles reported in rows 3 thru 6 of panel 6A, is likely caused by the downward shift of the age distribution of respondents. After all, younger individuals are known to be more susceptible to job loss.

Among reports of the probability of finding an equally good job, conditional on the loss of the current job, 79 percent were rounded values in the SEE sample but only 73 percent were rounded values in the PSID. Taken together, the findings in this section suggest that the PSID and SEE instructions yield similar proportions of rounded values. The SEE instructions may do better at inducing respondents to distinguish a small probability from a zero probability. Clearly, both survey instruments yielded fewer rounded values than did the method adopted in HRS:2.

5. Is "Yes, No, or Maybe" the Best We Can Do?

When discussing the validity of subjective probability data, it is common for researchers to argue that frequent reports of "0," "50," and "100" (or "0," "5," and "10") indicate respondents cannot articulate expectations in accordance with the intended response scale. As such, eliciting subjective probabilities may not be preferable to eliciting such qualitative responses as "yes," "no," or "maybe." Previous empirical evidence, especially Juster (1966), suggests that subjective probabilities are more informative than are qualitative responses. The positive evidence on the stability of responses over time reinforces the notion that the responses are meaningful. Nevertheless, it does seem worthwhile to examine the frequency and implications of responses which may indicate respondents have difficulty answering these questions appropriately.

To investigate this issue, I explore the frequency with which respondents choose the values 0, 50, and 100. In some cases, we may anticipate a high frequency of "0" responses. When the respondent must report the chance of job loss as an integer from 0 to 10, for example, the combination of the limited number of response categories and a low probability event should yield this result. We should therefore expect to see the frequency of these values differ across questions and across elicitation methods.

A comparison of these frequencies across questions and methods simply requires looking back to the entries in Tables 1 thru 3. We do see that the greatest proportion of "0" responses was given for the job loss question (0.54 in HRS:1), with probabilities of working full-time after age 65 a close second (0.52 in HRS:1). HRS:2 frequencies are similar. Not surprisingly, these questions also yield the fewest reports of a "100 percent chance." The greatest frequency of "50" (or "5") responses was given for the chance of living until age 75 (0.21 in HRS:1 and 0.27 in HRS:2), as was the greatest frequency of "100" (or "10") responses (0.22 in HRS:1 and 0.19 in HRS:2). Overall, the frequency of "0" and "100" ("10") responses tended to decrease between wave 1 and wave 2, while the frequency of "50" ("5") tended to increase. We saw previously that the PSID and SEE questions yielded fewer rounded values than the HRS:2 questions, and the pattern generally holds for this subset. The greatest gains appear to be in reducing the proportion of "0" responses in the SEE.

Simply observing that "0," "50," and "100" are reported more or less frequently does not help us identify the extent to which these responses are informative or not. Is a "50" or "5" any less valid than a "40" or "4?" Nothing thus far would support such a claim. For example, the conditional distributions reported in Tables 4 thru 6 are perfectly consistent with the interpretation that a "5" means a higher probability than "4" but lower than "6." Perhaps if we see that respondents who say "50" once are almost always giving that value, then we would be prepared to declare it an uninformative response. The frequency distribution of interest is therefore the frequency of such a response conditional on having given that same response to other questions. These conditional frequencies are reported in Tables 7. The sample contains only those 3740 HRS individuals who responded to each of the six subjective probability questions.

The top panel (7A) reports the proportion of respondents reporting a "0" for a given HRS:1 question conditional on reporting a "0" for one of the six questions. Corresponding proportions based on the HRS:2 data are reported in 7B. The remainder of Table 7 follows this format to describe patterns of responses of "50" and "100" in HRS:1 and HRS:2. To establish the appropriate benchmarks, the first row of each panel reports the unconditional proportions. The column ordering corresponds to the ordering of questions within the survey, easing identification of contagion effects, which do not seem to be severe, if even present.

Once again, it is difficult to summarize the findings in these tables. Several findings, however, are clear. Respondents who give a "0" to one question are generally more likely to give the same response to another question, but by no means are these correlations overwhelming. Moreover, responses to some questions may be positively correlated because the respondent's actual subjective expectations may be correlated.

As a simple illustration, consider the probabilities of working after age 62 and after age 65. By construction, the probability of working past 65 is 0.0 if the probability of working past age 62 is 0.0, so the conditional proportion of "0" responses (panel 7A, column 4) is 1.00. Not by construction, but sensibly enough, the proportion of "0" responses for age 62 conditional on a "0" for age 65 (column 3) is much higher than the unconditional proportion (0.54 versus 0.28).

A less obvious example occurs when we link the probability of working after age 65 with the probability of living until age 75. A sensible model of retirement behavior would predict that individuals with shorter survival expectations would tend to retire earlier. It should therefore not be surprising that the proportion of 0.0 probabilities of working past 65 would be higher among respondents with 0.0 probabilities of living past 75 than among all respondents (0.74 versus 0.52).

Perhaps correlations of "50" (or "5") responses are more indicative of problematic responses. In most cases, the conditional proportions are actually close to the unconditional proportions, indicating that the composition of individuals giving these responses varies considerably across questions. It is difficult, however, to reconcile any reports of a "50" for living past 75 with a "50" for living past 85 without attributing this pattern to noisy data, at best.

In sum, these findings do not suggest that the subjective probability data are of poor quality. It is likely that some respondents have difficultly conceptualizing the percent chance that something will happen. To the extent possible, a researcher may wish to identify these respondents by studying the correlation of reported probabilities across questions.

6. Are "What Do You Expect?" Point Expectations the Best We Can Do?

Consider again the methods for eliciting expectations of a continuous variable, such as the age of retirement. As a conceptual matter, we clearly obtain more information if we learn the series of points on the subjective cumulative distribution function rather than just some central feature of the subjective distribution. As a practical matter, however, perhaps it is better to just ask respondents, "When do you expect to retire?" rather than, "What is the probability that you will retire by age 60?...61?....62?...etc..." Given that the HRS elicits retirement expectations, or something close to that concept, in both ways, it is of interest to compare these responses.

To begin, Table 8 presents frequency distributions of responses to two HRS:1 questions: "At what age do you plan to stop working?" and "At what age do you plan to start working fewer hours?" The former (latter) question was asked if the respondent indicated he or she was "planning to stop working altogether (to work fewer hours)...at a particular date or age." Of the 1621 individuals who were asked both the planned age of stopping work question and the probability of working full-time after age 62 question, 98.5 percent reported the age and 99.6 percent reported the probability. Of the 1441 individuals who were asked both the planned age of working fewer hours question and the probability of working full-time after 62 question, 96.9 percent reported the age and 100 percent reported the probability. The distributions described in Table 8, as well as panel 9A (9B), pertain to the sample of individuals who reported both the planned age of stopping work (reducing hours) and the probability of working full-time after 62.

The frequency distributions reveal considerable bunching at ages 62 and 65 and, to a lesser extent, at ages 55 and 60. In fact, 81 percent reported one of these four values for the age of stopping work and 78 percent reported one of them for the age of reducing hours. Of course, we may expect the distribution of realizations to exhibit bunching as well, but perhaps not to this extent. What does this information tell us about how people choose to respond to these questions? It is certainly plausible that respondents tend to choose the mode of the subjective distribution, which in many applications would not be the most desired piece of information about this distribution.

What can we learn from the relationship between the probability of working full-time after age 62 and the planned age of either stopping work or reducing hours? If the responses are internally consistent, then they should be positively related. The conditional quantiles reported in Table 9 reveal that this proposition holds. As the probability of working full-time after 62 increases, the distribution of planned ages of stopping or reducing work tends to shift up the real line. Which type of response conveys more information is open to some interpretation, but two points should be clear. First, the subjective probabilities are directly interpretable but the ages are not. Second, much more information could be obtained by increasing the number of threshold values, especially values less than 62. We should not be discouraged by the prevalence of 0.0 probabilities, because this situation can be improved by varying the threshold values. Moreover, responses of "0" appear to be consistent with the planned age of stopping work and of reducing hours. Only 6 (6) percent of respondents who reported a 0.0 probability also reported a planned age of stopping work (reducing hours) in excess of 62, while 29 (41) percent reported ages less than 60.

One other relationship between the responses is intriguing. The proportion of 0.0 probabilities is nearly twice as high in the sample of respondents who reported a planned age of stopping work than in the sample as a whole. This finding reinforces the argument by Hurd and McGarry (1993) that people who have thought about or made plans for retirement tend to be closer to the age of retirement. Given the even greater prevalence of 0.0 probabilities of working after 65, I do not report distributions of planned retirement ages conditional on this probability.

7. Conclusions

The results of this analysis contribute to the accumulating body of evidence that researchers who wish to obtain direct reports of an individual's expectations can and should elicit expectations in the form of subjective probabilities rather than more traditional survey measures of expectations. As a conceptual matter, more information about the subjective expectations may be obtained from these data, and this information may be interpersonally comparable. As a practical matter, the alleged problems associated with probability elicitation do not seem severe. Moreover, the problems that may exist are no more severe than are those associated with other expectations elicitation methods. We have seen that the bunching of responses at round numbers is common to both subjective probabilities of working after 62 and the planned ages of stopping work or reducing hours. Where responses are concentrated at probabilities of 0.0 or 1.0, we know we can extract more information in some cases by changing the threshold values (e.g., ages past which you will be working full-time) and/or by revising the information given to respondents (e.g., the text describing the percent chance scale). In addition, nonresponse is negligible, and the subjective probabilities are reasonably stable over time.

This evidence should not only encourage researchers to collect more subjective probability data, but it should also encourage us to use the HRS data already available. The change from the 0 to 10 response scale in wave 1 to the [0,100] response scale in wave 2 does not appear to invalidate comparisons of responses over time. This collection of expectations questions is a valuable resource and should become more valuable as the panel continues. Revisions of the questions and explanatory text, however, may yield data of higher quality. To this end, more methodological research and experimentation are in order.

Appendix

HRS:1 Questions

F68. Sometimes people are permanently laid off from jobs that they want to keep. On a scale from 0 to 10 where 0 equals absolutely no chance and 10 equals absolutely certain, how likely is it that you will lose your job during the next year?

F69. Suppose you were to lose your job this month. What do you think are the chances that you could find an equally good job in the same line of work within the next few months?

F71. Looking again at the top of page 5...Thinking about work general and not just your present job, what do you think are the chances that you will be working full-time after you reach age 62.

F72. And what about the chances that you will be working full-time after you reach age 65?

F91. Are you currently planning to stop working altogether or work fewer hours at a particular date or age, to change the kind of work you do when you reach a particular age, have you not given it much thought, or what? (do not probe...check all that apply).

F91a. At what age do you plan to stop working?

F91b. At what age do you plan to start working fewer hours?

L7. What do you think are the chances that you will live to be 75 or more?

L8. And how about the chances that you will live to be 85 or more?

HRS:2 Questions

(introductory material presented in Section 2.3)

CFA102. Sometimes people are permanently laid off from jobs that they want to keep. On the same scale from 0 to 100 where 0 equals absolutely no chance and 100 equals absolutely certain, how likely is it that you will lose your job during the next year?

CFA103. Suppose you were to lose your job this month. What do you think are the chances that you could find an equally good job in the same line of work within the next few months?

CFA104. (Thinking about work in general and not just your present job,) What do you think are the chances that you will be working full-time after you reach age 62?

CFA105. And what about the chances that you will be working full-time after you reach age 65?

C6. (What is the percent chance) that you will live to be 75 or more?

C7. (What is the percent chance) that you will live to be 75 or more?

PSID Questions

(introductory material presented in Section 2.3)

N5. What is the percent chance that you will live to be 75 or more?

N6. What is the percent chance that you will live to be 85 or more?

N16. What is the percent chance that you will be laid off from your job in the next twelve months?

N17. Suppose you were to lose your job this month. What do you think the chances are that you could find an equally good job in the same line of work within the next few months?

N19. Thinking about work in general and not just your present job, what do you think the chances are that you will ne working full-time after you reach age 62?

N20. And what are the chances that you will be working full-time after you reach age 65?

SEE Questions

(introductory material presented in Section 2.3)

451. I would like you to think about your employment prospects over the next 12 months. What do you think is the PERCENT CHANCE that you will lose your job during the next 12 months?

452. If you were to lose your job during the next 12 months...What is the PERCENT CHANCE (or what are the chances out of 100) that the job you eventually find and accept would be at least as good as your current job, in terms of wages and benefits?

References

Anderson, K., R. Burkhauser, and J. Quinn (1986). "Do Retirement Dreams Come True? The Effect of Unanticipated Events on Retirement Plans?" *Industrial and Labor Relations Review* 39: 518-526.

Bernheim, B. D. (1990). "How Do the Elderly Form Expectations? An Analysis of Responses to New Information," in D. Wise, ed., *Issues in the Economics of Aging*, Chicago: University of Chicago Press.

Carroll, C. (1992). "The Buffer-Stock Theory of Saving: Some Macroeconomic Evidence," *Brookings Papers on Economic Activity* (2): 61-156.

Dominitz, J. and C. Manski (1996). "Using Expectations Data to Study Subjective Income Expectations," Department of Economics, University of Wisconsin-Madison.

Heeringa, S., D. Hill, D. Howell (1995). "Unfolding Brackets for Reducing Item Nonresponse in Economic Surveys," HRS Working Paper Series No. 94-029, Institute for Social Research, University of Michigan.

Honig, M. (1995). "Retirement Expectations by Race and Ethnicity," mimeo, presented at the Workshop on Minority Perspectives on the Health and Retirement Study, May.

Hurd, M. and K. McGarry (1993). "Evaluation of Subjective Probability Distributions in the HRS," HRS Working Paper Series No. 94-004, Institute for Social Research, University of Michigan.

Juster, F. T. (1966). "Consumer Buying Intentions and Purchase Probability: An Experiment in Survey Design," *Journal of the American Statistical Association* 61: 658-696.

Manski, C. (1990). "The Use of Intentions Data to Predict Behavior: A Best case Analysis," *Journal of the American Statistical Association* 85: 934-940.

Quadrel, M., B. Fischoff, and W. Davis (1993). "Adolescent (In)vulnerability," *American Psychologist* 48: 102-116.

Savage, L. (1971). "Elicitation of Personal Probabilities and Expectations," *Journal of the American Statistical Association* 66: 783-801.

Table 1. Frequency Distribution of Survival Probabilities

Percent Chance	1A. Probability of Living Until Age 75 HRS:1	HRS:2	PSID 50-61	1B. Probability of Living Until Age 85 HRS:1	HRS:2	PSID 50-61
0	**0.07**	**0.06**	**0.08**	**0.18**	**0.16**	**0.17**
1-4		0.00	0.01		0.00	0.01
5		0.01	0.01		0.02	0.03
6-9		0.00	0.00		0.00	0.00
10	**0.02**	**0.02**	**0.02**	**0.06**	**0.07**	**0.07**
11-14		0.00	0.00		0.00	0.00
15		0.00	0.02		0.01	0.03
16-19		0.00	0.00		0.00	0.00
20	**0.03**	**0.02**	**0.03**	**0.09**	**0.07**	**0.07**
21-24		0.00	0.00		0.00	0.00
25		0.02	0.02		0.05	0.06
26-29		0.00	0.00		0.00	0.00
30	**0.04**	**0.02**	**0.02**	**0.10**	**0.06**	**0.05**
31-34		0.00	0.00		0.00	0.00
35		0.00	0.01		0.01	0.01
36-39		0.00	0.00		0.00	0.00
40	**0.04**	**0.02**	**0.03**	**0.07**	**0.07**	**0.06**
41-44		0.00	0.00		0.00	0.00
45		0.00	0.02		0.00	0.03
46-49		0.00	0.00		0.00	0.00
50	**0.21**	**0.27**	**0.25**	**0.16**	**0.20**	**0.14**
51-54		0.00	0.00		0.00	0.00
55		0.00	0.01		0.00	0.01
56-59		0.00	0.00		0.00	0.00
60	**0.05**	**0.04**	**0.04**	**0.07**	**0.04**	**0.03**
61-64		0.00	0.00		0.00	0.00
65		0.01	0.01		0.01	0.01
66-69		0.00	0.00		0.00	0.00
70	**0.10**	**0.04**	**0.04**	**0.07**	**0.03**	**0.02**
71-74		0.00	0.00		0.00	0.00
75		0.09	0.07		0.05	0.04
76-79		0.00	0.00		0.00	0.00
80	**0.16**	**0.10**	**0.06**	**0.08**	**0.05**	**0.03**
81-84		0.00	0.00		0.00	0.00
85		0.01	0.01		0.01	0.01
86-89		0.00	0.00		0.00	0.00
90	**0.07**	**0.05**	**0.06**	**0.04**	**0.02**	**0.03**
91-94		0.00	0.00		0.00	0.00
95		0.01	0.04		0.00	0.02
96-99		0.00	0.01		0.00	0.00
100	**0.22**	**0.19**	**0.13**	**0.09**	**0.07**	**0.06**
all	1.00	1.00	1.00	1.00	1.00	1.00
# of obs.	7681	7681	1163	7681	7681	1163

Table 2. Frequency Distribution of Full-Time Work Probabilities

Percent Chance	2A. Probability of Working Full-Time After Age 62			2B. Probability of Working Full-Time After Age 65		
	HRS:1	HRS:2	PSID 50-61	HRS:1	HRS:2	PSID 50-61
0	**0.29**	**0.29**	**0.24**	**0.52**	**0.52**	**0.42**
1-4		0.00	0.01		0.01	0.01
5		0.01	0.02		0.03	0.05
6-9		0.00	0.00		0.00	0.00
10	**0.05**	**0.06**	**0.06**	**0.07**	**0.08**	**0.06**
11-14		0.00	0.00		0.00	0.00
15		0.00	0.01		0.00	0.02
16-19		0.00	0.00		0.00	0.00
20	**0.06**	**0.04**	**0.03**	**0.07**	**0.05**	**0.05**
21-24		0.00	0.00		0.00	0.00
25		0.03	0.04		0.03	0.03
26-29		0.00	0.00		0.00	0.00
30	**0.04**	**0.03**	**0.02**	**0.05**	**0.03**	**0.03**
31-34		0.00	0.00		0.00	0.00
35		0.00	0.00		0.00	0.01
36-39		0.00	0.00		0.00	0.00
40	**0.03**	**0.02**	**0.04**	**0.03**	**0.02**	**0.03**
41-44		0.00	0.00		0.00	0.00
45		0.00	0.01		0.00	0.01
46-49		0.00	0.00		0.00	0.00
50	**0.14**	**0.16**	**0.15**	**0.10**	**0.11**	**0.11**
51-54		0.00	0.00		0.00	0.00
55		0.00	0.01		0.00	0.00
56-59		0.00	0.00		0.00	0.00
60	**0.03**	**0.02**	**0.02**	**0.02**	**0.01**	**0.02**
61-64		0.00	0.00		0.00	0.00
65		0.00	0.01		0.00	0.01
66-69		0.00	0.00		0.00	0.00
70	**0.05**	**0.02**	**0.02**	**0.03**	**0.01**	**0.01**
71-74		0.00	0.00		0.00	0.00
75		0.04	0.05		0.02	0.02
76-79		0.00	0.00		0.00	0.00
80	**0.08**	**0.05**	**0.06**	**0.04**	**0.01**	**0.02**
81-84		0.00	0.00		0.00	0.00
85		0.01	0.01		0.00	0.01
86-89		0.00	0.00		0.00	0.00
90	**0.04**	**0.03**	**0.03**	**0.01**	**0.01**	**0.02**
91-94		0.00	0.00		0.00	0.00
95		0.01	0.02		0.00	0.01
96-99		0.00	0.01		0.00	0.00
100	**0.18**	**0.16**	**0.12**	**0.06**	**0.05**	**0.04**
all	1.00	1.00	1.00	1.00	1.00	1.00
# of obs.	4048	4048	818	4048	4048	818

Table 3. Frequency Distribution of Job Prospects Probabilities

3A. Probability of Job Loss During the Next Year

Percent Chance	HRS:1	HRS:2	PSID 50-61	SEE 50-61	PSID all	SEE all
0	**0.54**	**0.53**	**0.48**	**0.48**	**0.41**	**0.37**
1-4		0.02	0.02	0.12	0.03	0.12
5		0.04	0.06	0.07	0.06	0.12
6-9		0.00	0.00	0.00	0.00	0.00
10	**0.11**	**0.11**	**0.10**	**0.12**	**0.11**	**0.11**
11-14		0.00	0.00	0.00	0.00	0.00
15		0.01	0.03	0.01	0.04	0.02
16-19		0.00	0.00	0.00	0.00	0.00
20	**0.09**	**0.06**	**0.03**	**0.05**	**0.06**	**0.07**
21-24		0.00	0.00	0.00	0.00	0.00
25		0.02	0.03	0.02	0.02	0.01
26-29		0.00	0.00	0.00	0.00	0.00
30	**0.05**	**0.02**	**0.03**	**0.02**	**0.03**	**0.03**
31-34		0.00	0.00	0.00	0.00	0.00
35		0.00	0.00	0.00	0.00	0.00
36-39		0.00	0.00	0.00	0.00	0.00
40	**0.02**	**0.01**	**0.01**	**0.00**	**0.01**	**0.01**
41-44		0.00	0.00	0.00	0.00	0.00
45		0.00	0.00	0.01	0.01	0.00
46-49		0.00	0.00	0.00	0.00	0.00
50	**0.11**	**0.10**	**0.10**	**0.04**	**0.10**	**0.07**
51-54		0.00	0.00	0.00	0.00	0.00
55		0.00	0.00	0.00	0.00	0.00
56-59		0.00	0.00	0.00	0.00	0.00
60	**0.02**	**0.01**	**0.01**	**0.00**	**0.01**	**0.01**
61-64		0.00	0.00	0.00	0.00	0.00
65		0.00	0.00	0.01	0.00	0.00
66-69		0.00	0.00	0.00	0.00	0.00
70	**0.02**	**0.00**	**0.01**	**0.00**	**0.01**	**0.01**
71-74		0.00	0.00	0.00	0.00	0.00
75		0.01	0.01	0.01	0.01	0.01
76-79		0.00	0.00	0.00	0.00	0.00
80	**0.02**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**
81-84		0.00	0.00	0.00	0.00	0.00
85		0.00	0.01	0.01	0.00	0.00
86-89		0.00	0.00	0.00	0.00	0.00
90	**0.00**	**0.01**	**0.01**	**0.00**	**0.01**	**0.00**
91-94		0.00	0.00	0.00	0.00	0.00
95		0.00	0.01	0.00	0.01	0.00
96-99		0.00	0.00	0.01	0.00	0.00
100	**0.02**	**0.02**	**0.03**	**0.05**	**0.03**	**0.02**
all	1.00	1.00	1.00	1.00	1.00	1.00
# of obs.	4048	4048	818	132	6797	911

Table 3. Frequency Distribution of Job Prospects Probabilities (continued).

3B. Probability of Finding Equally Good Job, if Lose Job This Month

Percent Chance	HRS:1	HRS:2	PSID 50-61	SEE 50-61	PSID all	SEE all
0	**0.23**	**0.21**	**0.20**	**0.14**	**0.10**	**0.07**
1-4		0.01	0.01	0.03	0.01	0.02
5		0.02	0.04	0.04	0.02	0.02
6-9		0.00	0.00	0.00	0.00	0.00
10	**0.06**	**0.07**	**0.06**	**0.05**	**0.05**	**0.06**
11-14		0.00	0.00	0.00	0.00	0.00
15		0.01	0.03	0.01	0.02	0.00
16-19		0.00	0.00	0.00	0.00	0.00
20	**0.08**	**0.06**	**0.05**	**0.12**	**0.04**	**0.06**
21-24		0.00	0.00	0.00	0.00	0.00
25		0.03	0.04	0.02	0.03	0.03
26-29		0.00	0.00	0.00	0.00	0.00
30	**0.06**	**0.04**	**0.03**	**0.03**	**0.03**	**0.04**
31-34		0.00	0.00	0.00	0.00	0.00
35		0.00	0.01	0.00	0.01	0.00
36-39		0.00	0.00	0.00	0.00	0.00
40	**0.04**	**0.02**	**0.03**	**0.01**	**0.03**	**0.03**
41-44		0.00	0.00	0.00	0.00	0.00
45		0.00	0.00	0.00	0.01	0.00
46-49		0.00	0.00	0.00	0.00	0.00
50	**0.15**	**0.17**	**0.13**	**0.14**	**0.15**	**0.20**
51-54		0.00	0.00	0.00	0.00	0.00
55		0.00	0.00	0.00	0.00	0.00
56-59		0.00	0.00	0.00	0.00	0.00
60	**0.03**	**0.02**	**0.03**	**0.02**	**0.03**	**0.03**
61-64		0.00	0.00	0.00	0.00	0.00
65		0.00	0.00	0.00	0.01	0.00
66-69		0.00	0.00	0.00	0.00	0.00
70	**0.06**	**0.02**	**0.02**	**0.02**	**0.03**	**0.04**
71-74		0.00	0.00	0.00	0.00	0.00
75		0.05	0.05	0.07	0.06	0.05
76-79		0.00	0.00	0.00	0.00	0.00
80	**0.09**	**0.06**	**0.04**	**0.08**	**0.07**	**0.07**
81-84		0.00	0.00	0.00	0.00	0.00
85		0.01	0.01	0.03	0.02	0.02
86-89		0.00	0.00	0.00	0.00	0.00
90	**0.05**	**0.05**	**0.05**	**0.07**	**0.07**	**0.08**
91-94		0.00	0.00	0.00	0.00	0.00
95		0.01	0.03	0.02	0.04	0.04
96-99		0.00	0.01	0.02	0.02	0.02
100	**0.16**	**0.14**	**0.12**	**0.11**	**0.14**	**0.12**
all	1.00	1.00	1.00	1.00	1.00	1.00
# of obs	4048	4048	818	132	6797	911

Table 4. Quantiles of Conditional and Unconditional Distributions of Survival Probabilities

4A. Probability of Living Until Age 75

		Empirical Quantiles					
		0.10-Q	0.25-Q	0.50-Q	0.75-Q	0.90-Q	# of obs
unconditional distribution							
	HRS:1	0.20	0.50	**0.70**	0.90	1.00	7681
	HRS:2	0.20	0.50	**0.70**	0.91	1.00	7681
	PSID 50-61	0.10	0.40	**0.50**	0.85	1.00	1163
distribution of HRS:2 probability p2 conditional on HRS:1 probability p1							
	p1=0.0	0.00	0.00	**0.20**	0.50	0.75	500
	p1=0.1	0.00	0.02	**0.25**	0.50	0.70	122
	p1=0.2	0.00	0.10	**0.40**	0.50	0.75	263
	p1=0.3	0.00	0.25	**0.50**	0.50	0.80	292
	p1=0.4	0.05	0.30	**0.50**	0.70	1.00	288
	p1=0.5	0.20	0.50	**0.50**	0.75	0.95	1583
	p1=0.6	0.30	0.50	**0.60**	0.80	1.00	385
	p1=0.7	0.40	0.50	**0.70**	0.80	1.00	804
	p1=0.8	0.50	0.50	**0.75**	0.90	1.00	1195
	p1=0.9	0.50	0.70	**0.80**	0.90	1.00	575
	p1=1.0	0.50	0.70	**0.90**	1.00	1.00	1674

4B. Probability of Living Until Age 85

		Empirical Quantiles					
		0.10-Q	0.25-Q	0.50-Q	0.75-Q	0.90-Q	# of obs
unconditional distribution							
	HRS:1	0.00	0.20	**0.50**	0.70	0.90	7681
	HRS:2	0.00	0.10	**0.40**	0.60	0.90	7681
	PSID 50-61	0.00	0.10	**0.35**	0.60	0.90	1163
distribution of HRS:2 probability p2 conditional on HRS:1 probability p1							
	p1=0.0	0.00	0.00	**0.05**	0.25	0.50	1347
	p1=0.1	0.00	0.05	**0.20**	0.40	0.50	449
	p1=0.2	0.00	0.10	**0.25**	0.50	0.60	724
	p1=0.3	0.00	0.10	**0.30**	0.50	0.70	732
	p1=0.4	0.05	0.20	**0.40**	0.50	0.75	546
	p1=0.5	0.10	0.25	**0.50**	0.60	0.80	1196
	p1=0.6	0.10	0.30	**0.50**	0.70	0.80	508
	p1=0.7	0.20	0.40	**0.50**	0.75	0.85	574
	p1=0.8	0.20	0.50	**0.60**	0.80	1.00	605
	p1=0.9	0.20	0.50	**0.70**	0.90	1.00	289
	p1=1.0	0.25	0.50	**0.80**	1.00	1.00	711

Table 5. Quantiles of Conditional and Unconditional Distributions of Full-Time Work Probabilities

5A. Probability of Working Full-Time After Age 62

		Empirical Quantiles					
		0.10-Q	0.25-Q	0.50-Q	0.75-Q	0.90-Q	# of obs
unconditional distribution							
	HRS:1	0.00	0.00	**0.50**	0.80	1.00	4048
	HRS:2	0.00	0.00	**0.50**	0.80	1.00	4048
	PSID 50-61	0.00	0.05	**0.50**	0.80	1.00	818
distribution of HRS:2 probability p2 conditional on HRS:1 probability p1							
	p1=0.0	0.00	0.00	**0.00**	0.40	0.75	1163
	p1=0.1	0.00	0.00	**0.10**	0.50	0.75	184
	p1=0.2	0.00	0.00	**0.10**	0.40	0.75	260
	p1=0.3	0.00	0.05	**0.25**	0.50	0.80	178
	p1=0.4	0.00	0.10	**0.40**	0.57	0.90	136
	p1=0.5	0.00	0.10	**0.50**	0.75	1.00	112
	p1=0.7	0.00	0.30	**0.50**	0.80	1.00	207
	p1=0.8	0.00	0.50	**0.90**	1.00	1.00	331
	p1=0.9	0.10	0.50	**0.80**	1.00	1.00	175
	p1=1.0	0.00	0.50	**0.90**	1.00	1.00	716

5B. Probability of Working Full-Time After Age 65

		Empirical Quantiles					
		0.10-Q	0.25-Q	0.50-Q	0.75-Q	0.90-Q	# of obs
unconditional distribution							
	HRS:1	0.00	0.00	**0.00**	0.50	0.80	4048
	HRS:2	0.00	0.00	**0.00**	0.30	0.70	4048
	PSID 50-61	0.00	0.00	**0.10**	0.50	0.80	818
distribution of HRS:2 probability p2 conditional on HRS:1 probability p1							
	p1=0.0	0.00	0.00	**0.00**	0.10	0.50	2117
	p1=0.1	0.00	0.00	**0.05**	0.20	0.30	296
	p1=0.2	0.00	0.00	**0.10**	0.30	0.50	294
	p1=0.3	0.00	0.00	**0.10**	0.50	0.75	199
	p1=0.4	0.00	0.00	**0.20**	0.50	0.80	112
	p1=0.5	0.00	0.00	**0.25**	0.50	0.80	407
	p1=0.6	0.00	0.20	**0.50**	0.70	0.80	78
	p1=0.7	0.00	0.10	**0.45**	0.50	0.90	109
	p1=0.8	0.00	0.10	**0.50**	0.80	1.00	142
	p1=0.9	0.00	0.05	**0.50**	0.85	1.00	59
	p1=1.0	0.00	0.10	**0.50**	1.00	1.00	235

Table 6. Quantiles of Conditional and Unconditional Distributions of Job Prospects Probabilities

6A. Probability of Job Loss During the Next Year

		Empirical Quantiles					
		0.10-Q	0.25-Q	0.50-Q	0.75-Q	0.90-Q	# of obs
unconditional distribution							
	HRS:1	0.00	0.00	**0.00**	0.30	0.50	4048
	HRS:2	0.00	0.00	**0.00**	0.20	0.50	4048
	PSID 50-61	0.00	0.00	**0.02**	0.25	0.50	818
	SEE 50-61	0.00	0.00	**0.01**	0.10	0.45	132
	PSID all	0.00	0.00	**0.05**	0.30	0.50	6797
	SEE all	0.00	0.00	**0.05**	0.20	0.50	911
distribution of HRS:2 probability p2 conditional on HRS:1 probability p1							
	p1=0.0	0.00	0.00	**0.00**	0.10	0.40	2180
	p1=0.1	0.00	0.00	**0.05**	0.15	0.50	428
	p1=0.2	0.00	0.00	**0.10**	0.20	0.40	379
	p1=0.3	0.00	0.00	**0.10**	0.35	0.50	205
	p1=0.4	0.00	0.00	**0.20**	0.50	0.50	79
	p1=0.5	0.00	0.00	**0.20**	0.50	0.75	442
	p1=0.6	0.00	0.00	**0.20**	0.50	0.80	71
	p1=0.7	0.00	0.05	**0.30**	0.55	0.90	84
	p1=0.8	0.00	0.00	**0.10**	0.50	0.60	83
	p1=0.9	0.00	0.00	**0.10**	0.25	0.50	20
	p1=1.0	0.00	0.00	**0.20**	0.40	1.00	77

6B. Probability of Finding Equally Good Job, If Lose Job This Month

		Empirical Quantiles					
		0.10-Q	0.25-Q	0.50-Q	0.75-Q	0.90-Q	# of obs
unconditional distribution							
	HRS:1	0.00	0.10	**0.50**	0.80	1.00	4048
	HRS:2	0.00	0.10	**0.50**	0.80	1.00	4048
	PSID 50-61	0.00	0.05	**0.40**	0.80	1.00	818
	SEE 50-61	0.00	0.10	**0.50**	0.80	1.00	132
	PSID all	0.00	0.25	**0.50**	0.90	1.00	6797
	SEE all	0.05	0.25	**0.50**	0.90	1.00	911
distribution of HRS:2 probability p2 conditional on HRS:1 probability p1							
	p1=0.0	0.00	0.00	**0.10**	0.50	0.80	933
	p1=0.1	0.00	0.00	**0.20**	0.50	0.90	245
	p1=0.2	0.00	0.05	**0.25**	0.50	0.80	314
	p1=0.3	0.00	0.10	**0.30**	0.70	0.85	238
	p1=0.4	0.00	0.10	**0.35**	0.75	0.85	156
	p1=0.5	0.00	0.10	**0.50**	0.70	0.90	592
	p1=0.6	0.00	0.20	**0.50**	0.80	0.90	114
	p1=0.7	0.00	0.20	**0.50**	0.80	0.98	235
	p1=0.8	0.10	0.40	**0.60**	0.90	1.00	359
	p1=0.9	0.10	0.50	**0.75**	0.90	1.00	200
	p1=1.0	0.10	0.50	**0.90**	1.00	1.00	662

Table 7. Conditional and Unconditional Proportions of 0, 50, and 100 Responses

7A. Proportion of Responses Equal to 0 in HRS:1

	Job Loss	Good Job	Work 62	Work 65	Live 75	Live 85	# of Obs.
All respondents	**0.53**	**0.23**	**0.28**	**0.52**	**0.04**	**0.14**	3740
Conditional on							
lose job = 0	1.00	0.25	0.34	0.58	0.04	0.15	1992
good job = 0	0.60	1.00	0.39	0.66	0.08	0.21	842
work 62 = 0	0.63	0.31	1.00	1.00	0.07	0.20	1058
work 65 = 0	0.60	0.28	0.54	1.00	0.06	0.20	1945
live 75 = 0	0.50	0.40	0.47	0.74	1.00	1.00	163
live 85 = 0	0.54	0.33	0.39	0.72	0.30	1.00	540

7B. Proportion of Responses Equal to 0 in HRS:2

	Job Loss	Good Job	Work 62	Work 65	Live 75	Live 85	# of Obs.
All respondents	**0.53**	**0.20**	**0.28**	**0.51**	**0.04**	**0.13**	3740
Conditional on							
lose job = 0	1.00	0.24	0.34	0.58	0.04	0.14	1984
good job = 0	0.64	1.00	0.44	0.69	0.08	0.21	742
work 62 = 0	0.64	0.31	1.00	1.00	0.06	0.18	1050
work 65 = 0	0.60	0.27	0.55	1.00	0.05	0.17	1920
live 75 = 0	0.57	0.39	0.47	0.67	1.00	1.00	146
live 85 = 0	0.59	0.32	0.38	0.67	0.30	1.00	484

7C. Proportion of Responses Equal to 5 in HRS:1

	Job Loss	Good Job	Work 62	Work 65	Live 75	Live 85	# of Obs.
All respondents	**0.11**	**0.15**	**0.14**	**0.10**	**0.21**	**0.16**	3740
Conditional on							
lose job = 5	1.00	0.21	0.19	0.15	0.27	0.18	407
good job = 5	0.15	1.00	0.16	0.13	0.28	0.19	549
work 62 = 5	0.15	0.16	1.00	0.25	0.30	0.18	541
work 65 = 5	0.16	0.19	0.36	1.00	0.26	0.19	373
live 75 = 5	0.14	0.19	0.20	0.12	1.00	0.20	798
live 85 = 5	0.12	0.17	0.16	0.12	0.26	1.00	614

Table 7. Conditional and Unconditional Proportions of 0, 50, and 100 Responses (continued).

7D. Proportion of Responses Equal to 50 in HRS:2

	Job Loss	Good Job	Work 62	Work 65	Live 75	Live 85	# of Obs.
All respondents	**0.16**	**0.17**	**0.16**	**0.11**	**0.28**	**0.21**	3740
Conditional on							
lose job = 50	1.00	0.18	0.22	0.15	0.38	0.22	567
good job = 50	0.11	1.00	0.20	0.11	0.36	0.27	625
work 62 = 50	0.13	0.21	1.00	0.20	0.36	0.25	604
work 65 = 50	0.14	0.18	0.31	1.00	0.34	0.27	396
live 75 = 50	0.13	0.21	0.21	0.13	1.00	0.22	1053
live 85 = 50	0.10	0.21	0.19	0.14	0.30	1.00	787

7E. Proportion of Responses Equal to 10 in HRS:1

	Job Loss	Good Job	Work 62	Work 65	Live 75	Live 85	# of Obs.
All respondents	**0.02**	**0.16**	**0.17**	**0.06**	**0.21**	**0.09**	3740
Conditional on							
lose job = 10	1.00	0.17	0.14	0.06	0.17	0.07	70
good job = 10	0.02	1.00	0.28	0.12	0.35	0.17	607
work 62 = 10	0.02	0.26	1.00	0.32	0.33	0.15	647
work 65 = 10	0.02	0.33	0.95	1.00	0.42	0.20	215
live 75 = 10	0.02	0.27	0.28	0.12	1.00	0.41	779
live 85 = 10	0.02	0.32	0.30	0.13	0.96	1.00	331

7F. Proportion of Responses Equal to 100 in HRS:2

	Job Loss	Good Job	Work 62	Work 65	Live 75	Live 85	# of Obs.
All respondents	**0.02**	**0.13**	**0.17**	**0.05**	**0.19**	**0.07**	3740
Conditional on							
lose job = 100	1.00	0.19	0.15	0.06	0.28	0.10	72
good job = 100	0.03	1.00	0.32	0.10	0.36	0.17	499
work 62 = 100	0.02	0.26	1.00	0.28	0.33	0.13	618
work 65 = 100	0.02	0.27	0.96	1.00	0.42	0.21	180
live 75 = 100	0.03	0.25	0.29	0.11	1.00	0.34	708
live 85 = 100	0.03	0.34	0.33	0.15	0.98	1.00	248

Table 8. Frequency Distribution of Planned Ages of "Retirement"

Age	Plan to Stop Working	Plan to Reduce Hours
38-49	0.00	0.01
50	0.00	0.01
51	0.00	0.00
52	0.00	0.01
53	0.01	0.01
54	0.01	0.01
55	**0.07**	**0.09**
56	0.02	0.02
57	0.02	0.02
58	0.03	0.03
59	0.03	0.02
60	**0.10**	**0.12**
61	0.02	0.01
62	**0.42**	**0.34**
63	0.03	0.02
64	0.01	0.01
65	**0.22**	**0.22**
66	0.00	0.00
67	0.00	0.00
68	0.00	0.00
69	0.00	0.00
70	0.01	0.02
71-95	0.00	0.01
all	1.00	1.00
# of obs.	1590	1396

Source: Health and Retirement Study, Wave 1

Table 9. Conditional and Unconditional Quantiles of Planned Ages of "Retirement"

9A. Planned Age of Stopping Work

	Empirical Quantiles					
	0.10-Q	0.25-Q	0.50-Q	0.75-Q	0.90-Q	# of obs
All respondents	56	60	**62**	63	65	1590
Conditional on probability of f-t work after 62 (p*)						
p*=0.0	55	58	**62**	62	62	786
p*=0.1	55	59	**60**	62	62	70
p*=0.2	56	60	**62**	62	65	90
p*=0.3	56	62	**62**	62	65	62
p*=0.4	58	60	**62**	63	65	49
p*=0.5	60	62	**62**	65	65	149
p*=0.6	62	62	**63**	65	65	24
p*=0.7	62	62	**65**	65	65	39
p*=0.8	62	63	**65**	65	65	70
p*=0.9	62	65	**65**	65	65	52
p*=1.0	62	65	**65**	65	66	199

9B. Planned Age of Reducing Hours of Work

	Empirical Quantiles					
	0.10-Q	0.25-Q	0.50-Q	0.75-Q	0.90-Q	# of obs
All respondents	55	60	**62**	65	65	1396
Conditional on probability of f-t work after 62 (p*)						
p*=0.0	55	55	**60**	62	62	360
p*=0.1	55	57	**60**	62	62	45
p*=0.2	55	57	**60**	62	64	93
p*=0.3	55	60	**62**	62	65	71
p*=0.4	55	58	**62**	62	63	54
p*=0.5	56	60	**62**	62	65	209
p*=0.6	57	62	**62**	63	65	39
p*=0.7	57	60	**62**	65	65	67
p*=0.8	58	60	**62**	65	65	106
p*=0.9	60	63	**65**	65	67	51
p*=1.0	60	62	**65**	65	65	301

Source: Health and Retirement Study, Wave 1