TIAA Institute

How to enhance longevity awareness

Abigail Hurwitz,
Hebrew University
of Jerusalem

Olivia S. Mitchell,
The Wharton School
University of Pennsylvania,
TIAA Institute Fellow

Orly Sade,
Hebrew University
of Jerusalem

Many people have only a vague notion of the concept of life expectancy and the longevity risk they face at older ages, which in turn implies that they are likely to save too little for retirement and have a low demand for longevity insurance products. Our paper employs an online experiment to investigate alternative ways to describe both life expectancy and longevity risk, with the goal of assessing whether these can raise peoples' awareness of possible retirement shortfalls. We also evaluate whether providing this information promotes interest in saving activity and demand for annuities. We find that providing longevity risk information impacts respondents' subjective survival probabilities, while simply describing average life expectancy does not. Yet providing life expectancy or longevity information significantly affects people's recommendations to annuitize one's retirement wealth. Interestingly, we also show that merely prompting people to think about financial decisions changes their perceptions regarding subjective survival probabilities.

We seek to understand how people estimate and then use subjective survival probabilities to make long-term financial decisions regarding retirement saving and decumulation. Some individuals may consult sources of information such as publicly available survival tables, or they could evaluate their own known characteristics that might affect their survival outcomes (e.g., health, own health habits, and parents' longevity). Still others exhibit systematic biases when predicting longevity. For example, many people tend to overstate mortality rates at relatively young ages but understate them at older ages. A different type of bias is related to over-optimism. For instance, smokers tend to be optimistic about their own life expectancies. Additionally, some people may actually avoid information relating to their longevity, perhaps due to anxiety associated with thoughts about dying.

BUILT TO PERFORM.
CREATED TO SERVE.

The question of how people evaluate their longevity when making financial decisions is of interest to researchers and policymakers, along with determining whether better financial decision making could result from rendering this information more salient. For instance, it is of interest to determine whether people can be educated or better informed about life expectancy and longevity risk, which may be helpful when making saving and withdrawal decisions. Our project builds and implements alternative ways to explain and illustrate life expectancy and longevity risk in an effort to determine what presentations enhance people's understanding of their chances of living a very long time. Specifically, our survey first measures how people assess their own life expectancies and longevity risk, which we can compare to sex/age life tables for the general population. Next, we show respondents specific vignettes that help us test alternative ways to frame survival probabilities in an experimental setting. We find that simply asking participants to think about life cycle financial decisions (regardless of life expectancy and longevity interventions) significantly decreases the gap between their subjective and life table survival probabilities. We further show that, while providing *life expectancy* information has no significant effect on whether they believe they will live a long time, informing them about *longevity* does significantly change their estimates. Finally, we show that providing information to participants does change the way people think about long-term financial recommendations regarding annuitization.

Experimental design

We developed, fielded, and analyzed a nationally representative survey of Americans using the Prolific internet-based survey platform.[1] Our survey participants are a representative sample of U.S. residents age 35-83 on whom we gathered a variety of demographic data, and to whom we also provided information regarding life expectancy and longevity risk.[2] In total, we conducted 12 manipulations: 3 information variants, 2 variants involving the timing of the information provided to the subjects, and 2 different economic tasks. In 6 manipulations for 2,902 subjects, we first elicited peoples' subjective survival probabilities, and then we provided participants with alternative messages regarding life expectancy and longevity risk. We also posed tasks to respondents regarding hypothetical saving behavior and demand for longevity insurance products. In the other 6 manipulations for 1,478 subjects, we first posed the several tasks and different messages, followed by our elicitation of subjective survival probabilities.

We used vignettes to present survey respondents with the opportunity to advise a hypothetical vignette person facing decisions about saving and decumulation. By randomly presenting different vignettes, we can control for variation that might otherwise impart noise to the analysis. Specifically, we created two vignettes. The first was about a single man (woman) age 60, without children, needing to decide how to withdraw his (her) retirement savings. The second was about a single man (woman) age 40, without children, deciding whether to increase his (her) retirement savings. Some of our survey participants received a 'baseline' version of the vignettes, while others received additional information about life expectancy and longevity. Specifically, the baseline **annuitization vignette** was as follows:

> Next we will describe a financial decision facing Mr. Smith and then we will ask you ask what you would recommend to this person: Mr. Smith is a single, 60-year-old man with no children. He will retire and claim his Social Security benefits at 65. When he retires, he will have $100,000 saved for his retirement, and he will receive $1,400 in monthly Social Security benefits.

Imagine that Mr. Smith asks you about how to manage his $100,000 retirement savings. Please indicate which one of the two options you would recommend:

1. Withdraw the entire $100,000 all at once from the retirement account, to use as he needs.

2. Receive a regular monthly sum of $500 (equal to $6,000 yearly) for the rest of his life.

Just as before, Mr. Smith is still a single, 60-year-old man with no children who will retire and claim Social Security benefits at 65. When he retires, he will have $100,000 saved for his retirement, and he will receive $1,400 in monthly Social Security benefits. But now he has a third option that he can choose from. Please indicate which one of the three options you would recommend:

1. Withdraw the entire $100,000 all at once from the retirement account, to use as he needs.

2. Receive a regular monthly sum of $500 (equal to $6,000 yearly) for the rest of his life.

3. Withdraw a lump sum of $50,000 at retirement, and receive a monthly sum of $250 (equal to $3,000) for the rest of his life.

The baseline **savings vignette** was as follows:

Mr. Smith is a single, 40-year-old man with no children. He will retire and claim his Social Security benefits at 65. When he retires, he will have $100,000 saved for his retirement, and he will receive $1,400 in monthly Social Security benefits. Please indicate which one of these options you would recommend:

1. Maintain his current saving level.

2. Slightly increase his long-term savings by spending less.

3. Significantly increase his long-term savings by spending less.

4. Don't know.

Some participants also received the following **additional information** about **life expectancy** (average survival probabilities):

Please note that American men, 65 years old, will survive 18.1 more years on average

This informational intervention aimed to draw attention to the concept of life expectancy within a vignette focused on a financial decision. Specifically, our conjecture was that if people were capable of taking life expectancy information into consideration but were reluctant to do so due to avoid thinking about mortality, providing them with the information at the time they make different relevant decisions might lead to better financial outcomes (Bloom et al., 2006; Hurd and Smith, 2004).

In this study, we are concerned with long-term savings and withdrawal decisions, so the second informational intervention was structured to provide longevity information. Specifically, our aim was to draw attention to the possibility of living to a very old age and to the financial risk from doing so. In particular, these participants received the following additional information regarding **longevity risk**:

Please note that 22.3% of American men, 65 years old, will survive to the age of 90 or more.

Table 1 presents the structure of our Prolific experiment. Specifically, we randomized each participant into one of two vignettes using the Qualtrics randomizer;[3] half of the participants were exposed to the **annuitization condition** and the other half to the **saving condition**, both described above. Moreover, all participants in both treatments were exposed to *either* the life expectancy information, the longevity information, or neither (control group). To test whether the informational intervention influenced peoples' subjective survival probabilities,

---

[3]   Qualtrics is a popular survey platform widely used to conduct online experiments.

2,902 participants were asked about their survival probabilities before they saw the vignette, while 1,478 first saw the vignette and then received the additional information. We further asked each respondent several demographic questions, some financial literacy questions, a few "brain teasers" to judge their numeracy skills, time and risk preference questions, questions about their health, and questions regarding COVID-19. (The questionnaire appears in full version of the paper.)

Table 1. Experimental design: Number of participants by treatment group and vignette presentation

	Life expectancy	Longevity	Control	Total
Savings	725	728	730	2,183
Annuitization	734	731	723	2,188
Total	1,459	1,459	1,453	4,371

Note: Participants were randomly allocated to a savings or an annuitization vignette. In each, respondents received either *life expectancy information* (condition 1), *longevity information* (condition 2), or no additional information (Control).

Impacts on subjective vs. objective life expectancy

As our aim was to study how to enhance longevity awareness, we first measure what people knew and how accurately they estimated their life expectancy by asking two questions measuring longevity perceptions. First, we measure longevity perceptions by asking participants the following question:[4]

> What is the percent chance [0-100] that you think you will live at least ${e://Field/AgeDeath} more years?

Here, the target age varied by the respondent's sex and age. Second, we also asked participants about their subjective probabilities of living to an age five years younger than in the question above. We also identified the group that we call *consistent participants* as those who correctly reported their probability of living to age (X-5) as higher than their probability of living to age X.

Our two main outcome variables of interest in this first analysis are *Optimistic*, a variable taking the value of one if the participant anticipated a probability of living to the target age that exceeded the respective probability in U.S. life tables*,* and *SLE-LE*, the difference between the respondent's subjective versus life table survival probability. The average difference between respondents' subjective and life table survival probabilities was 17% (median 10%) across all participants. Furthermore, the distribution of SLE-LE is skewed to the right, suggesting that our sample tends to be optimistic (see Figure 1). These results are consistent with past studies suggesting that people tend to overestimate their survival chances at much older ages.

4   We use cohort life tables from the U.S. Social Security Administration to calculate the actual average probability of living to each target age (by age, sex, and year of birth).

Figure 1. Distribution of difference in subjective minus life table probability (SLE-LE) of living to age X
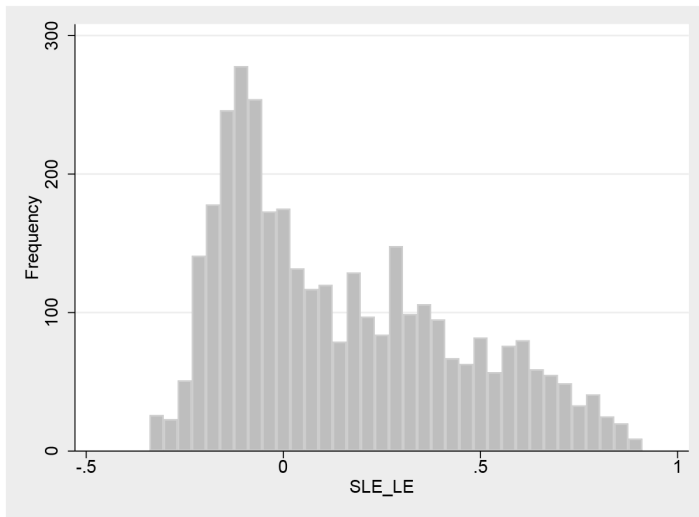
Note: Sample excludes participants with non-coherent life expectancy estimations, although results are similar if they are included.

Next, we explore the characteristics of respondents who over- or underestimated their survival probabilities using the two variables described above. We also controlled on **Vignette first**, indicating that the vignette was presented before asking the respondent the subjective survival probability questions. Other control factors included *Male* (=1 if respondent was male, else 0); *Coll* (=1 if the respondent had completed at least college, else 0); and *Good health* (=1 if self-reported health was good/very good/excellent, else 0). *FinLit* refers to the total number of questions the respondent answered correctly based on the Big Three questions developed by Lusardi and Mitchell;[5] we measure *Numeracy* as the sum of correct answers to a three-item numeracy measure.[6] *Present preferences* were calculated using four questions about preferences for winning versus losing various sums of money immediately versus a year later taken (i.e., win $20 vs. $30, lose $20 vs. $30, win $1,000 vs. $1,500, lose $1,000 vs. $1,500). Individuals who reported they would rather win less money now and lose more money later were considered to have higher present preferences and received higher scores on a 0–4 scale.[7] To verify that participants were paying *attention* to the survey, we included a request that they skip one of the questions.[8] Finally, since we fielded this study in February-March

---

[5] Participants were asked the following financial literacy questions: (1) Suppose you had $100 in a savings account and the interest rate was 2% per year. After 5 years, how much do you think you would have in the account if you left the money to grow: More than $102; Exactly $102; Less than $102; Don't know; Refuse; (2) Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After 1 year, with the money in this account, would you be able to buy: More than today; Exactly the same as today; Less than today; Don't know; Refuse; (3) Do you think that the following statement is true or false? "Buying a single company stock usually provides a safer return than a stock mutual fund." True; False; Don't know; Refuse. On average, our respondents answered 2.4 questions correctly.

[6] Participants answered three questions pertaining to basic probability calculations: (1) Imagine that we rolled a fair six-sided die 1,000 times. Out of 1,000 rolls, how many times do you think the die will come up even (2, 4, or 6)?; (2) Imagine that we rolled a five-sided die 50 times. On average, out of these 50 throws, how many times will this five-sided die show an odd number (1, 3, or 5)? (3) In BIG BUCK LOTTERY, the chance of winning a $10 prize is 1%. What is your best guess about how many people would win a $10 prize if 1,000 people each bought a single ticket from BIG BUCKS?) On average, they correctly answered 1.8 questions.

[7] The average present preferences score was 1.77.

[8] 57% skipped the question as requested; we control for this in our regressions.

2020 during the early part of the COVID-19 outbreak, we also included a question asking whether people anticipated facing negative financial consequences from the outbreak.[9]

Our evidence confirms that respondents who saw the vignette *before* being asked about survival probabilities were less likely to be optimistic about their anticipated life expectancy. In fact, seeing the vignette first decreased respondents' optimism gap by about eight percentage points. This implies that simply prompting people to think about a financial decision related to longevity risk can narrow over-optimism regarding longevity expectations. This is an interesting result, suggesting that reducing the over-optimism gap could result from giving people access to information about survival patterns before they make important financial decisions.

Three 'treatments' were also included in our vignettes, and each respondent saw only one of these. The first was a *control condition* where no further information was provided; the second provided a *life expectancy condition* where participants received information on the life expectancy of either a 65-year-old male or female; and the third was a *longevity condition* where participants were told of the probability of survival to age 90 either a 65-year-old male or female. Figure 2 shows that, regardless of the intervention, mean SLE-LE was lower when the vignette was seen before people had to estimate their survival probabilities (left bar), versus afterwards (right bar).[10] The fact that this result is also true for the control group (condition 1) suggests that it is not attributable to our providing life expectancy information (condition 2) or longevity information (condition 3). Rather, it implies that prompting people to think about a financial decision *per se* reduces optimism regarding life expectancy. Moreover, older people were less optimistic, but men, the college-educated, and those in good health were significantly more likely to expect to outlive the mean life expectancy age generated from life tables. Interestingly, individuals who answered more of the financial literacy and numeracy questions correctly were also less likely to overestimate their longevity.

Figure 2. Mean difference between respondents' subjective minus life table probability (SLE-LE) of living to age X: By treatment and question order
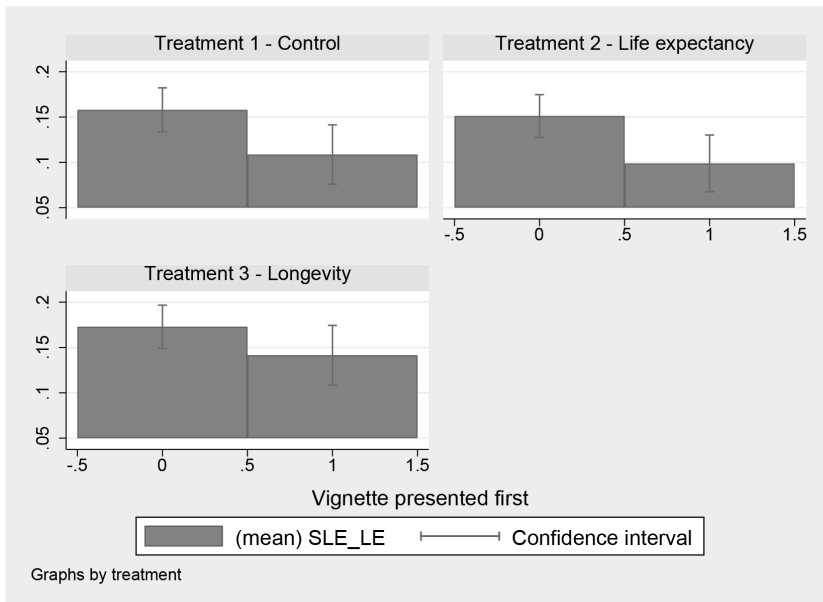
Note: The right (left) that the vignette was seen before (after) people had to estimate their survival probabilities. Half of the participants were exposed to the annuitization condition and the other half to the saving condition (see text). All participants were exposed to the life expectancy information, the longevity information, or neither (control group). Sample excludes participants with non-coherent life expectancy estimations.

These different information frames had interesting effects on participants' subjective survival probabilities. For instance, being shown the vignette narrowed respondent optimism regarding longevity, but overall, the life expectancy and longevity risk information both had no significant effect on peoples' subjective survival probabilities. By contrast, when we focus on only those participants whom we defined as consistent, getting the longevity treatment significantly increased the optimism gap between subjective and objective survival probabilities–by a significant 3 percentage point change, or a 21% change. Accordingly, though some people may have been familiar with the concept of longevity, even those who understood probabilities still benefited from receiving additional information about the tail risk. Thus, simply providing information about the probability of living to a very old age can shape peoples' subjective survival probabilities, suggesting that in the normal course of affairs, people may give little thought to these facts.

Impact of information on financial decision making

To assess whether alternative forms of information about longevity risks influenced financial outcomes, we showed participants *either* a **savings** or **annuitization** vignette. The savings vignette introduced participants to a 40-year-old single person with no children needing to decide about his or her long-term savings, and we asked the respondent to provide guidance to the hypothetical individual. Our results indicate that only 14.6% of participants recommended that the vignette individual maintain his/her saving level, while 30.69% recommended slight increases, and 52.27% proposed significant increases in savings (2.43% said they did not know). Our findings indicate that it does not matter for the savings decisions whether people saw the vignettes before or after we asked about their subjective life expectancies. We also find that the informational intervention had no significant effect on savings recommendations.

Turning to participants' propensity to recommend annuitizing (versus choosing a lump-sum option at retirement) after seeing the annuitization vignette, we somewhat surprisingly found that giving people the life expectancy information did have a positive significant effect, while the longevity intervention did not increase annuity preferences. Holding other variables at their means, those receiving life expectancy information had a 6.7% higher probability of recommending annuitization.

Next, we split the sample into participants who were pessimistic regarding their life expectancy (subjective survival probabilities below those in the life tables), for whom our intervention could be the most influential and participants who were optimistic regarding their survival chances.[11] Interestingly, the pessimistic group was most strongly affected by our intervention. Specifically, holding other variables at their means, pessimistic participants receiving life expectancy information had a 15.5% higher probability of recommending annuitization, while pessimistic participants receiving longevity information had an 11.8% higher probability of recommending annuitization. We further show that this result regarding life expectancy continues to hold when we exclude internally inconsistent participants. While one might think that such a policy could harm those who are optimistic to begin with, we provide evidence that the information provided to optimistic individuals did not decrease their annuitization recommendations.

Also, the more financially literate respondents were more more likely to recommend annuitization, as were people who devoted closer attention to the survey. By contrast, people with strong preferences for present over future consumption were less likely to favor annuities. Finally, people who feared negative financial outcomes from COVID-19 were also unlikely to favor annuities.

Conclusions

Good consumer financial decision making requires people to have a clear idea of their life expectancy and longevity risk so as to save, invest, and decumulate

thoughtfully and avoid running out of money in old age. Nevertheless, there are still many open questions regarding how much people understand about these important estimates, and whether providing information about the facts can make a difference in the decision-making process. Additionally, given the asymmetry of the longevity distribution, little is known about what type of information should be provided regarding life expectancy or the size of the longevity tail. In our paper, we employed an online survey and vignettes to determine not only whether individuals correctly estimate their own survival probabilities but also whether more information about life expectancy and the longevity tail can improve these estimates. We also show how respondents incorporate these estimates into advice regarding financial decisions.

Our contribution is to show that providing people information about their likely longevity *does* change peoples' perceptions of their survival probabilities, while giving them life expectancy information has little effect. We also document that merely getting people to think about a long-term financial decision can alter their optimism regarding survival probabilities. Accordingly, we conclude that research on peoples' longevity perceptions should be linked to making economic decisions. Also, providing people with either life expectancy or longevity information significantly affects their financial recommendations regarding annuitization.

Our work contributes to the academic literature about life expectancy, saving, annuitization decisions, and experimental household finance. Moreover, our results can also inform insurers and policymakers on how to encourage people to annuitize and make other financial decisions relevant for later life. Finally, peoples' perceptions of survival probabilities were altered by the COVID-19 pandemic, and in turn, this decreased their tendency to recommend for both saving and annuitizing. Future research will need to investigate whether perceptions and behavior revert when the pandemic is over.

---

[11]   Participants who provide no subjective survival probabilities were excluded from this analysis.

About the authors

Abigail Hurwitz is an Assistant Professor at the Hebrew University of Jerusalem. Her research is dedicated to long term saving, consumption and annuity choices. She seeks to better understand financial behavior in order to influence policy as well as to develop and promote savings products and to increase the demand for annuities. Hurwitz holds a Ph.D. in Finance as well as an M.A. and B.A. in Business and Economics from the Hebrew University of Jerusalem. She was previously a Post-doctorate visiting scholar at the Wharton school of the University of Pennsylvania.

Olivia S. Mitchell is the International Foundation of Employee Benefit Plans Professor; professor of insurance/ risk management and business economics/public policy; Executive Director of the Pension Research Council; and Director of the Boettner Center for Pensions and Retirement Research; all at the Wharton School of the University of Pennsylvania.

The author or coauthor of over 230 books and articles, Mitchell serves as independent trustee on the Wells Fargo Fund Boards; co-investigator for the Health and Retirement Study at the University of Michigan; and executive board member of the Michigan Retirement Research Center. She earned her B.A. in economics from Harvard University and Ph.D. in economics from the University of Wisconsin – Madison.

Orly Sade is Associate Professor of Finance at the Department of Finance, School of Business Administration, Hebrew University of Jerusalem. She is also a Visiting Associate Professor at the Stern School of Business, NYU, and she previously visited NYU Shanghai, IE Madrid, and NES, Moscow. Dr. Sade directed the BA program at The Hebrew University and received the Abe Gray award from the President of the Hebrew University. Previously Dr. Sade served on the advisory board of the Israeli Ministry of Finance's capital market division and the board of directors of the Israeli Securities Authority. She also served on the investment committee for the "Hadassah" pension fund, the provident fund for Hebrew University employees, the welfare fund for Hebrew University employees, the investment committee responsible for investing funds of the academic staff union of Hebrew University, and "responsibility" mutual funds. She has also served as an outside director at Sigma Mutual Funds, and she worked in the Banking Supervision Department of the Bank of Israel.