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Testing Methods to Enhance Longevity Awareness

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Testing Methods to Enhance Longevity Awareness

Abstract

Many people do not understand the concepts of life expectancy and longevity risk, potentially leading them to under-save for retirement or to not purchase longevity insurance, which in turn could reduce wellbeing at older ages. We investigate alternative ways to increase the salience of both concepts, allowing us to assess whether these change peoples' perceptions and financial decision making. Using randomly-assigned vignettes providing subjects with information about either life expectancy or longevity, we show that merely prompting people to think about financial decisions changes their perceptions regarding subjective survival probabilities. Moreover, this information also boosts respondents' interest in saving and demand for longevity insurance. In particular, longevity information influences both subjective survival probabilities and financial decisions, while life expectancy information influences only annuity choices. We provide some evidence that many people are simply unaware of longevity risk.

Keywords: retirement expectations; annuity; longevity; life expectancy
JEL Codes: G52, J32, D91

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I. Introduction

Understanding how individuals judge their own survival probabilities and use these estimates when making financial decisions is important for households, researchers, and policymakers. This is because, to prepare financially for old age, people need to understand how long they will survive and make informed decisions about how quickly to draw down their savings in retirement, when to claim their Social Security and pension benefits, and whether to purchase annuities to reduce the risk of outliving their assets. Nevertheless, these are not simple decisions for many, due to low financial literacy and cognitive shortcomings (Finke et al. 2017), myopia and other behavioral biases (Benartzi and Thaler 1999, 2007), and limited attention (Karlan et al. 2016).

This paper employs an online survey to measure how people assess their own life expectancy – the average number of life years remaining – and longevity risk – the chances of living to a very old age. Next, we assess alternative methods to boost peoples' awareness of longevity risk to see if it influences their financial decision making. Specifically, we randomly assign to participants of an online study different vignettes that allow us to experimentally test alternative ways to frame survival probabilities. Our goal is to evaluate which presentation enhances people's understanding of their chances of living a very long time. If a substantial portion of the population incorrectly estimates survival probabilities when making financial decisions, or ignores such information, making evidence about life expectancy and longevity risk more salient could enhance retirement security and affect the resources available for the elderly.

Prior research has found that, when some people make their survival forecasts, they appear to be aware of publicly-available population survival tables (Hamermesh 1985, Post and Hanewald 2013). Other work (Hurd and McGarry 2002; McGarry, 2022) has shown that people consider their own personal characteristics known to affect survival outcomes (e.g., sex,

health, own health habits, and parents' longevity). These beliefs have been shown to correlate with financial decision making. For instance, survey respondents who believe they will live longer than average also save more (Bloom et al. 2007); conversely, people having very low subjective probabilities of survival retire earlier and claim their Social Security benefits earlier than those expecting to live longer (Hurd and Smith 2004).[1] Other studies provide evidence for a relationship between subjective life horizon and portfolio choices (Spaenjers and Spira 2015).

Nevertheless, individuals also can exhibit systematic biases when predicting longevity, leading them to make financial mistakes. For instance, Elder (2013) and Abel et al. (2021) reported that younger people overstated mortality rates, but older people understated them. Wu et al. (2015) found that subjective life expectancies differed from life table data by age. Another type of bias relates to over-optimism: for instance, smokers tend to be optimistic about their own life expectancies (Hurwitz and Sade 2020 a, b).

In addition to biases that individuals may have when they contemplate their own longevity, some may avoid thinking about mortality due to what Becker (1973) and others have called 'death denial' (e.g., Dor-Ziderman et al. 2019; Greenberg et al. 1986). In one example, individuals could choose whether or not to receive information related to their longevity such as their HIV status (Lyter et al., 1987). Such behavior could be motivated by anxiety associated with thoughts about death, leading some to repress, or deny, mortality information (Kopczuk et al. 2005). In turn, this behavior can produce an 'Ostrich effect' (Galai and Sade 2006; Karlsson et al. 2009), where some are willing to pay a price in order to avoid thinking about and gathering information about mortality probabilities when it is unpleasant to think about death (McGarry 2022).

[1] See Salm (2010) on consumption, saving choices, and subjective mortality rates, and Teppa and Lafourcade (2014) on subjective life expectancy and demand for annuities.

In what follows, we first examine how people assess their own life expectancies and longevity risk and compare these to sex/age life tables for the general population (taking into account many personal variables linked to own health). Next, we assess alternative methods to boost peoples' awareness of the risk of living a very long time. Specifically, we use vignettes to test alternative ways to frame survival probabilities in an online experimental setting, permitting us to evaluate which presentation appears to enhance people's understanding of their chances of living a very long time. Accordingly, our work can inform insurers and policymakers on how to encourage people to annuitize and make other financial decisions relevant for later life.

We find that merely asking participants to think about life cycle financial decisions significantly narrows the gap between subjective and life table survival probabilities (while controlling for additional relevant factors), regardless of life expectancy and longevity interventions. We randomized our subjects to different treatments and further show that providing *life expectancy* information has no significant effect on whether people believe they will live a long time (longevity optimism), whereas informing them about the tail risk associated with *longevity* does significantly change their estimates. Finally, we discover that providing information to participants also changes how people think about annuitization decisions.

This subject is important for researchers and policymakers, as well as those concerned about when and how people save for, and then withdraw from, retirement accounts. For instance, if a substantial portion of the population incorrectly estimates or ignores life expectancy when making financial decisions, it might be feasible to promote better financial decision making by rendering this information more salient. In addition, individuals could be educated or informed about longevity risk when they make important saving and decumulation decisions, so as to better manage their chances of running of money in later life.

The remainder of the paper proceeds as follows. Section 2 outlines our methodology and experimental design using a representative sample of American respondents age 35-83. In Section 3, we present the data, empirical analysis, and results. In Section 4, we conclude and discuss policy implications.

II. Methodology and Experimental Design

To assess ways to boost peoples' awareness of the risk of living a very long time, we devised and fielded an online incentivized survey[2] of 5,108 U.S. residents age 35-83 in April/July of 2020, recruited via the Prolific internet-based "crowd-working" survey platform.[3] Respondents' mean age was 49.9, and 43.7% were male; 60.7% had completed college or graduate school. Over half (58.5%) were married.[4] Of the respondents, 85% believed their health was good, very good, or excellent; median monthly self-reported income was $4,900, or about $58,800 per year, close to the US median annual household income of $61,937 (U.S. Census Bureau, 2022). Average household monthly income was $13,529 (about US$162,348 annually).[5]

To evaluate what respondents knew and how accurately they estimated their survival chances, we asked two questions measuring longevity perceptions which are similar to those used in the US Health and Retirement Study.[6] First, we asked participants: *What is the percent*

[2] For a review of experimental methods related to financial and annuitization decisions see Hurwitz and Sade (2021)

[3] Prolific (www.prolific.ac) is an online survey platform managed by Oxford University. It reports several demographic variables about participants allowing researchers to screen for respondents with particular characteristics (e.g., age, sex, country of residence). It has been judged to be transparent, extremely useable, and highly valuable to researchers due to the sample diversity and the rate of honest answers compared to MTurk, a commonly used platform (Peer et al. 2017; Palan and Schitter 2018).

[4] Our marital sample statistics are similar to those of the U.S. population. For instance, in the 40-44 age group, 60% of participants are married (66% according to 2019 U.S. Census Bureau data).

[5] We also conducted several tests to ensure the quality of responses such as: (1) recording and evaluating the time that each task was completed; (2) only including participants who completed the survey; (3) excluding 1% of survey participants taking less than 287 seconds (4.7 minutes). These conditions did not change our findings. We also instructed participants to skip a question to evaluate their attentiveness, and we control for whether they did so (57% percent did) in our regression analysis. Online Appendix Table A reports full descriptive statistics.

[6] Welcome to the Health and Retirement Study (umich.edu)

chance [0-100] that you think you will live at least ${e://Field/AgeDeath} more years? Here, the target age was an old one (as we discuss financial decisions relevant later in life) varied according to the respondent's sex and age.[7] Second, we asked participants about their subjective probabilities (chances) of living to an age *five years younger* than in the question above. The subgroup we deem the *consistent participants* were those who correctly reported a probability of living to age (X-5) as greater than their probability of living to age X (or equal if their reported chances equaled 0 or 100; this group comprised 74% of the full sample).

To generate the experimental information of interest, we created two vignettes that were asked either before or after our survival probability elicitation questions (we control for the order in our analysis).[8] The first was about a single man (woman) age 60, with no children, needing to decide how to withdraw his (her) retirement savings. The second was about a single man (woman) age 40, with no children, deciding whether to increase his (her) retirement savings. Some of our participants received only the 'baseline' version of the vignettes, while others received additional information about life expectancy. 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.*[9]

In some treatments we also included the following choice:

[7] For instance, a male respondents aged 40 was asked about the probability to live to age 90 while a male aged 80 was asked about the probability to live to age 95. See Online Appendix B an Online Appendix Table A2 for additional details. We used U.S. Social Security Administration cohort life tables to calculate the actual probability of living to each target age (by age/sex/year of birth).

[8] The use of vignettes has a long history in the medical field, and they have grown increasingly popular in economics applications (Brown et al. 2019; Samek, Kapteyn, and Gray 2021).

[9] To calculate the annuity, we use a conversion factor of 16.67, close to the conversion factor used by U.S. insurers.

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. Our hypothesis was that if people are capable of taking life expectancy information into consideration yet are reluctant to do so due to avoid thinking about mortality, then providing them with the information at the time they make relevant decisions might help them overcome this reluctance and lead to better-informed financial outcomes.

As we are also concerned with long-term savings and withdrawal decisions, the second informational intervention was structured to provide longevity information. Our aim was to **draw attention to the possibility of living to a very old age** and the attendant financial risk. Specifically, these participants received the following additional information regarding longevity risk: *Please note that 22.3% (33.2%) of American men (women) 65 years old will survive to the age of 90 or more.*

We randomized each respondent into one of the two vignettes using the Qualtrics[10] randomizer; half of the participants were exposed to the **annuitization condition,** and the other half to the **saving condition** described above. All participants in both treatments were exposed

[10] Qualtrics is a professional survey platform: https://www.qualtrics.com

to *either* the life expectancy information, the longevity information, or none (control group). To test whether the informational intervention influenced peoples' subjective survival probabilities, 2,902 participants were asked about their survival probabilities *before* they saw the vignette, while 2,206 first saw the vignette and afterwards received the additional information. We further asked each respondent questions about their demographics, financial literacy, time and risk preferences, health; we also asked a question to ensure they were paying attention, and a question regarding COVID-19 (as the survey was fielded in late spring of 2020; see Online Appendix B).[11] Overall, we conducted 12 manipulations in total as presented in Table 1.[12]

Table 1 here

For the empirical analysis, we first compute each person's *SLE-LE*, or the difference between the respondent's subjective versus his/her life table (age/sex/cohort) survival probability. To understand what factors are associated with over- or underestimating survival probabilities, we then estimated the following multivariate model where the dependent variable is *SLE-LE*:

$$SLE - LE_i = \alpha + \boldsymbol{\beta_1 Vignette\ first_i} + \boldsymbol{\beta_2 Life\ expectancy\ intervention_i} + \boldsymbol{\beta_3 Longevity\ intervention_i} + \gamma X_i' + \epsilon_i$$

Control variables include an indicator for having received either the life expectancy ($\boldsymbol{Life\ expectancy\ intervention_i}$) or the longevity condition ($\boldsymbol{Longevity\ intervention_i}$). ***Vignette first*** indicates that the vignette was presented prior to asking the respondent the subjective survival probability question, and this variable is only

[11] Specifically, we asked, "*The coronavirus may cause economic challenges for some people regardless of whether they are actually infected. What is the percent chance you will run out of money because of the coronavirus in the next three months?*" On average, our respondents believed that there was a 21.4% chance they would run out of money due to COVID-19.

[12] We also had variation in the gender of the vignette individual: that is, participants were randomly assigned to either Mr. or Mrs. Smith. However, the difference between the gender of the participant and the gender of the vignette induvial did not significantly affect the recommendations at the 5% level.

included in the full sample specification.[13] X_i' is a vector of control variables including: *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 number of financial literacy questions the respondent answered correctly based on Lusardi and Mitchell's (2008, 2014) Big Three questions.[14] *Present preferences* are calculated using four questions about preferences for winning versus losing various sums of money immediately versus a year later, taken from Khwaja et al. (2007) (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.[15] Since we fielded our study during the early part of the COVID-19 outbreak, we also included a question asking people's perceived chances of facing negative financial consequences from the outbreak.[16] Finally, we add controls for being consistent, paying attention, and having income above the national median income.

To evaluate whether alternative information presentations about longevity risk influenced people's recommendations to save or annuitize more, we estimate two logit models where our alternative dependent variables ($DepVar_i$) are (1) advise to significantly increase savings; and (2) advise to annuitize. All other variables are described as for equation (1):

[13] 43% of respondents saw the vignette before the subjective survival questions.
[14] See Online Appendix B for the Big Three financial literacy questions (Q31, 32, and 78). On average, our respondents answered 2.4 out of 3 questions correctly.
[15] See Online Appendix B for the present preference questions (Q26-29 and Q77). The average present preferences score was 1.77.
[16] Originally, we also asked respondents about their chances of getting COVID-19 and the chance to die from it. These variables were significant in a multivariate regression, but since COVID-19 was not the core of this study we only included one in of these our specification presented here. The effect of our intervention is similar if we include all COVID-19 controls, as reported in online Appendix Tables A4 and A5. For further discussion of the Covid-19 variables and savings decisions see Hurwitz, Mitchell and Sade (2021). Our results regarding the relationship of potential financial consequences and life expectancy are consistent with findings from Polyakova et al. (2020) who documented that the excess mortality caused by COVID-19 was correlated with economic damage and age.

$$(2)\ DepVar_i = \alpha + \boldsymbol{\beta_1 Vingette\ first_i} + \boldsymbol{\beta_2 life\ expectancy\ intervention_i} + \boldsymbol{\beta_3 longevity\ intervention_i} + \gamma X_i' + \epsilon_i.$$

III. Results

We focus first on *SLE-LE*, the difference between each respondent's subjective versus objective life table survival expectancy by age/sex/cohort.[17] Across all participants, the average difference between subjects' subjective and objective survival expectancy is 17.1% (median 10%).[18] Furthermore, the distribution of *SLE-LE* is positively skewed, suggesting that our respondents believed their chances of living to older ages are higher than life tables would predict.[19] Figure 1 shows the mean of *SLE_LE* (the difference between the respondent's subjective versus his/her life table (age/sex/cohort) expectancy) by treatment and question order (a positive value reflects optimism comparing to life tables). Specifically, those who saw the vignette before being asked about subjective survival probabilities had a value of SLE_LE of 9.1% in the control group, 9.6% in the life expectancy treatment, and 12.34% in the longevity treatment. Clearly, showing the longevity information before the vignette boosted peoples' subjective survival chances compared to the control group.

Figure 1 here

To explore which respondents over- or underestimated their survival chances as measured by this variable, we next report results from multivariate models for the full sample, and also only for respondents who saw the vignette before answering the subjective survival

[17] Puri and Robinson (2007) related the difference between self-reported life expectancy survey responses as well as statistical mortality tables, to household economic behaviors. Huffman et al. (2017) and Maurer and Mitchell (2020) have also employed this variable in modeling financial decisions.

[18] Our survival probabilities refer to the chances of living to an age older than 80 (depending on the respondents' current age; see Online Appendix Table A2.

[19] These results accord with prior evidence (Ludwig and Zimper 2013; Wu et al. 2015; Heimer et al. 2017; O'Dea and Sturrock 2020). We further compared the main attributes of over- and underestimators. On average, older and financially literate participants are more likely to be underestimators, while nonwhite, educated, married, individuals in good health and those with income above the median are less likely to be underestimators. See Online Appendix Table A3.

questions.[20] Results in Table 2 confirm that, for the full sample, respondents who saw the vignette *before* they were questioned about survival probabilities were significantly less likely to overestimate their life expectancies. In fact, seeing the vignette first decreased these respondents' *SLE-LE* gap between their self-reported and life table survival rates by 5.2 percentage points.[21] In other words, simply prompting people to think about a financial decision related to longevity risk affected peoples' estimates of their own anticipated lifespans.

Table 2 here

Table 2 also reports the impact of our two vignette treatments versus the control group (where the latter received no additional information): the *life expectancy treatment* gave participants information on the life expectancy of a 65-year-old male/female (randomly assigned), and the *longevity condition* told respondents the chances of survival to age 90 of a 65-year-old male/female. Interestingly, our results show that being exposed to the longevity treatment significantly increased the gap between respondents' self-assessed survival expectations and the objective life tables.[22] That is, people who first received the vignette containing the longevity information (column 1) became more over-optimistic about living longer than their life table probability: their *SLE-LE* was 4 percentage points higher than the control group (or 25.9%=0.04/0.154). Accordingly, though some people may have previously been familiar with the notion of longevity, our respondents became more over-optimistic about living a long time after receiving the additional information about survival tail risk.[23]

[20] Since the intervention (life expectancy or longevity information) was embedded in the vignette, participants' survival estimates would not change if they did not see the vignette beforehand.
[21] Mean SLE_LE for our sample was 17.1%.
[22] Additional analysis reveals that the strongest effect is found among younger individuals (below are 50) that are far from the consequences of their decisions yet still able to change their behavior. We also looked separately at the effect for healthy vs. unhealthy individuals and found that most of the effect was related to responses of healthy individuals.
[23] We acknowledge that life tables represent average life expectancies, and respondents may have private information influencing their subjective estimates. Yet because we have a large sample randomly assigned to the treatments, we expect that our results will represent the average effect of the treatments on each group.

Our conjecture regarding a potential factor driving this result is related to the differences in how much attention people pay in general to the concept of life expectancy versus longevity. To support this conjecture, we examined the number of online US Census Bureau (nd) publications that mentioned life expectancy versus longevity. Our search showed that over five times more publications related to life expectancy, compared to longevity. This confirms that life expectancy information is much more readily available to individuals seeking information about survival patterns. Second, we used Google trends to measure general interest in both concepts over the past two decades. Results in Figure 2 confirm that, since 2004, the number of Google measure for searches for life expectancy was 2-3 times larger than for longevity. Accordingly, it is likely that our survey respondents were more likely to be more informed about life expectancy than longevity as members of the general public. Therefore, when we provided them with the longevity information in our experiment, it made a greater difference to their way of thinking than did the life expectancy information.

Figure 2 here

In sum, simply providing people with information about the probability of living to a very old age did influence our respondents' understanding of the chances of living a long time in old age.[24] Moreover, showing the alternative information treatment about life expectancy did not significantly change respondents' *SLE-LE*. We also conclude that older persons, men, and those who scored higher on the financial literacy index were less likely to have a gap between subjective and objective survival probabilities, while nonwhites and those in good health had a larger gap.

Next we turn to an examination of whether and how the information treatments influenced respondents' recommended financial advice to the vignette individuals (see Table

[24] As an alternative approach, Post and Bruine de Bruin (2021) evaluate how getting people to explain their financial decisions can help them talk about how they perceive the value of annuitization.

3).[25] Overall, only 14.3% of participants recommended that the vignette individual maintain his/her saving level; by contrast, 30.6% recommended slight saving increases, and 52.7% proposed significant increases in savings (only 2.4% said they did not know). A multivariate Logit analysis of participants' propensity to recommend saving more and annuitizing (versus choosing a lump-sum option at retirement) after seeing the annuitization vignette is provided in Table 3. Here, columns (1) and (3) focus on the full sample, while columns (2) and (4) include only the *underestimators*[26] who initially understated their life expectancies compared to the life table. Results for those who received the savings vignette appear in the first two columns, and for those receiving the annuitization vignette appear in the latter two columns.

Table 3 here

Our results indicate, first, that neither the life expectancy nor the longevity treatment altered savings recommendations (columns 1-2).[27] Second, showing people life expectancy and longevity information did boost their recommendations to annuitize, significantly so among those who initially underestimated their life expectancy (columns 3-4). Holding other variables at their means, underestimators given the life expectancy information were 13.24% more likely (=0.1/0.755) to recommend annuitization, whereas underestimators receiving the longevity treatment were 9.4% more likely (=0.071/0.755) to recommend annuitization (column 4).[28] We also find that men, present-biased individuals, and those financially damaged by Covid-19, were less likely to recommend both savings and annuitization. Older persons and educated individuals were more likely to recommend others to boost savings, while those who score

[25] Each participant received either a savings or an annuitization vignette.

[26] This group is of special interest inasmuch as underestimating life expectancy and longevity could lead to under-saving and lack of annuitization.

[27] Recent literature has suggested that nudges may be more effective in some domains than in others. To this end, Kristal and Whillans (2020) emphasize the importance of publishing studies with limited results, to illustrate in which domains these interventions are successful and in which not, as well as to assist policymakers seeking to evaluate nudge impacts.

[28] We also tested for robustness using only the over-estimator subgroup, and we found that information provided to this group did not significantly decrease their annuitization recommendations.

higher on the financial literacy index were more likely to recommend both savings and annuitization.

IV. Conclusions and Implications

Making good financial decisions about retirement requires people to have a well-informed idea of their life expectancy and their longevity risk, so they can save, invest, decumulate sensibly, and avoid running out of money in old age. Nevertheless, there are still many open questions regarding what people understand about these important factors, and whether providing information about survival risks makes a difference in the decision making process. We employed an experimental survey with vignettes to determine if individuals could correctly estimate their own survival probabilities, and to assess whether providing them with information about life expectancy and the longevity tail improved the advice they gave regarding financial decisions.

Our contribution is to show that providing people who understand conditional probability information about their likely **longevity** *does* change their perceptions about living a long time, while providing **life expectancy** information has no effect. This suggests that many people in the general population are already reasonably aware of their *mean* survival chances, but they are less well-informed about the *right tail* of the survival distribution. This evidence can inform regulators and insurers so they provide people with the less familiar information about longevity risk, thus helping them make better decumulation decisions. This information can also be embedded in retirement calculators and other tools used by financial advisors.[29]

We also provide novel evidence that merely getting people to think about a long-term financial decision can alter their over-estimation regarding survival probabilities. Accordingly,

[29] For instance, the American Academy of Actuaries (nd) has recently launched an interesting online longevity illustrator available for public use.

we suggest that future research on peoples' longevity perceptions should be linked to how they make financial decisions. Most importantly, from a policy perspective, providing underestimators with either life expectancy or longevity information can significantly increase the likelihood that they will recommend annuitization (longevity insurance), but it does not significantly affect savings recommendations.

In the face of a rapidly aging population, our results suggest valuable avenues for new research on saving and annuitization decisions, as well as behavioral household finance. In addition, our results also can inform financial institutions, insurers, and policymakers on the importance of providing consumers information on longevity risk, so as to help people make better financial decisions essential for later life. Specifically, financial planners and other retirement advisors could provide longevity information to clients on a regular basis (e.g., in yearly reports), as well as when they make major lifetime financial decisions. Moreover, while boosting the salience of longevity information can be done in different ways, one potential policy is related to the information provided by the US Census Bureau (nd). Since we find that over time, five times more online publications of the Bureau are related to life expectancy, compared to longevity, our results could encourage the Bureau to devote more importance to longevity risk information in their publications. And very importantly, longevity risk could usefully be embedded into financial education programs so as to alert consumers to the importance of not outliving their retirement assets.

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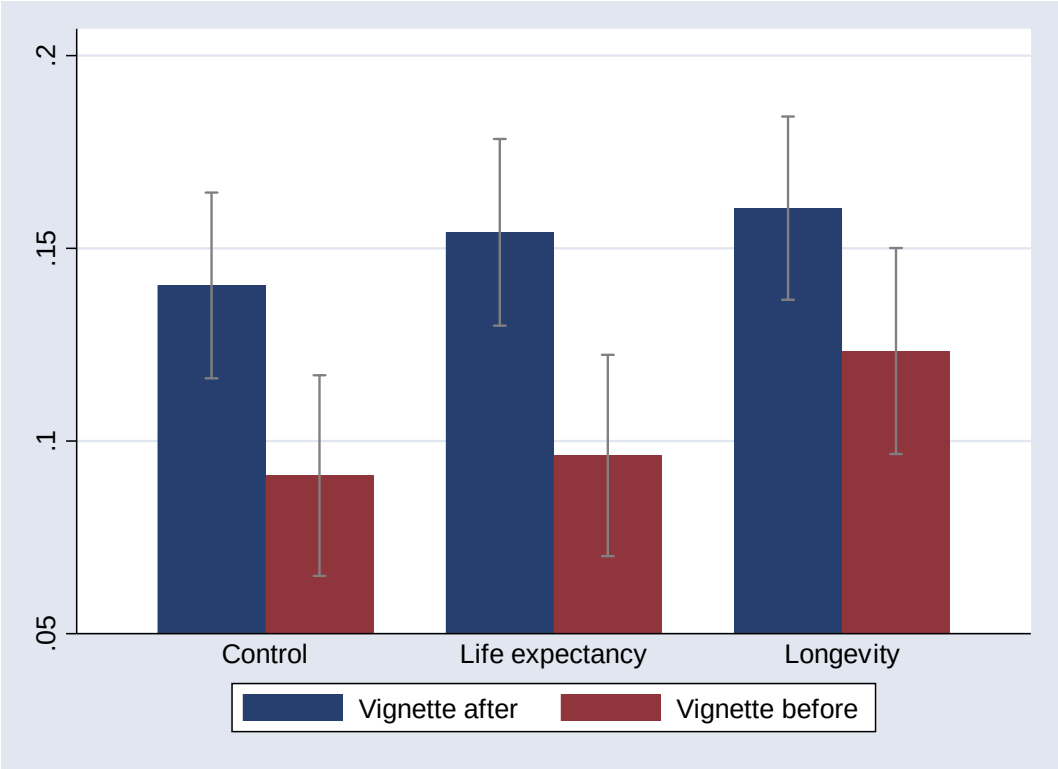
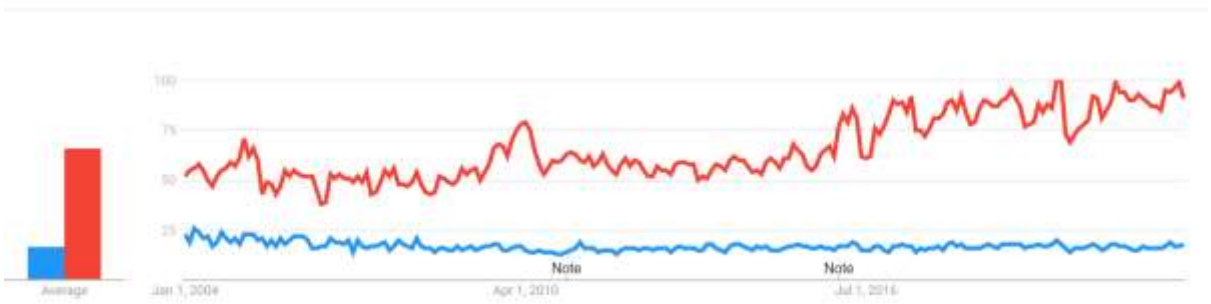
Figure 1. Mean *SLE-LE* with Confidence Intervals*:* By Treatment and Question Order in Prolific Sample



Note: *SLE-LE* refers to the difference between each respondent's subjective versus life table survival probability (see text). All participants were exposed to either no treatment (the control group); the life expectancy information treatment; or the longevity information treatment. Half of the participants were exposed to the annuitization condition, and the other half to the saving condition (see text). Respondents who saw the vignette *before* they were asked their survival probabilities appear in the red (right) bar; those who saw the vignette *afterwards* appear in the blue (left) bar. We also provide the confidence interval for the relevant variable in each of the bars. The confidence intervals confirm that seeing the vignette first significantly decreased respondents' self-assessed chances of living longer than the life table in the control and life expectancy treatments. The longevity treatment increased subjective survival assessments (as confirmed by the confidence intervals of the longevity treatment comparing to the control and life expectancy, before seeing the vignette). Sample includes only consistent participants (see text).

Figure 2. Trends in Interest in Life Expectancy and Longevity Terms over Time



Note: To assess popular interest in longevity comparing to interest in life expectancy, we used the Google trends tool (https://trends.google.com/trends/). This reports a normalized measure of search volume in the US on Google for the terms "life expectancy" (red) and "longevity" (blue). The evidence reveals that, since 2004, individuals search for the term 'life expectancy' 2-3 times as often as they search for the term 'longevity,' and this gap is increasing over time.

Table 1. Experimental Design: Number of Participants by Information Treatment Group and Vignette Presentation, Prolific Sample

	Information Treatment			
Vignette Presentation	**Life expectancy**	**Longevity**	**Control**	**Total**
Savings	844	853	853	2,550
Annuitization	853	852	837	2,542
Total	1,697	1,705	1,690	5,092

Note: Respondents were randomly allocated to a savings or an annuitization vignette. In each case, respondents received either *life expectancy information* (condition 1), *longevity information* (condition 2), or no additional information (control); see text. Sixteen participants declined to answer the vignette questions and are excluded from this table.

Table 2. Impact on Difference between Subjective vs Life Table Survival Probability (*SLE-LE*): OLS Model, Prolific Sample

	SLE-LE: (OLS) *Participants seeing vignette first*	*SLE-LE:* (OLS) *Full sample*
Saw vignette first		-0.052***
		(0.009)
Life expectancy treatment	0.005	0.007
	-0.016	(0.011)
Longevity treatment	0.040**	0.025**
	-0.016	(0.011)
Covid out of money	0.023	-0.005
	(0.025)	(0.016)
Age	-0.001	-0.002***
	(0.001)	(0.001)
Non-white	0.074***	0.088***
	(0.018)	(0.012)
Male	-0.046***	-0.031***
	(0.014)	(0.009)
College-Plus	0.034**	0.012
	(0.015)	(0.010)
Married	-0.009	0.017
	(0.015)	(0.010)
Good health	0.146***	0.178***
	(0.019)	(0.013)
Fin lit score	-0.022**	-0.023***
	(0.009)	(0.006)
Present preferences	0.001	-0.000
	(0.005)	(0.003)
Income>natl median	0.026	0.018
	(0.015)	(0.010)
Paid attention	0.028**	0.012
	(0.013)	(0.009)
Consistent	-0.142***	-0.123***
	(0.014)	(0.010)
Constant	0.153***	0.246***
	(0.059)	(0.035)
Observations	1,867	4,162
Pseudo R-sq/R-sq	0.122	0.121
Dep. Var. Mean	0.154	0.171
Dep. Var. St. Dev.	0.296	0.303

Note: *SLE-LE* measures the difference between the respondent's subjective versus objective survival probability. Column (1) includes only participants who saw the vignette (and hence received the informational interventions) before being asked about their subjective survival probabilities. Column (2) includes the full sample. Key control variables of interest include seeing the vignette first and the treatment information provided (life expectancy vs. longevity treatment) In addition, we control on age, sex, education, marital status, self-reported health, financial literacy, present preference score, income, attention to the survey, COVID financial vulnerability, and an indicator

of consistency (those who understood the survival probability questions; see text). Standard errors in parentheses. *** $p < 0.01$. ** $p < 0.05$

Table 3: How Longevity and Life Expectancy Information Shape Financial Advice: Average Marginal Logit Effects, Prolific Sample

	Savings vignette		Annuitization vignette	
	(1) Full sample	(2) Under-estimators	(3) Full Sample	(4) Under-estimators
Saw vignette first	0.001	0.055	-0.003	0.024
	(0.020)	(0.034)	(0.018)	(0.030)
Life expectancy treatment	-0.020	0.024	0.039	0.100***
	(0.024)	(0.039)	(0.022)	(0.036)
Longevity treatment	-0.020	-0.025	-0.000	0.071**
	(0.024)	(0.040)	(0.022)	(0.035)
Covid out of money	-0.127***	-0.121**	-0.101***	0.000
	(0.035)	(0.061)	(0.031)	(0.054)
Age	0.002	0.004**	0.002	0.002
	(0.001)	(0.002)	(0.001)	(0.002)
Non-white	0.019	0.046	0.005	-0.019
	(0.027)	(0.053)	(0.024)	(0.045)
Male	-0.048**	-0.028	-0.046**	0.035
	(0.020)	(0.033)	(0.019)	(0.031)
College-Plus	0.075***	0.064	0.009	0.002
	(0.021)	(0.035)	(0.020)	(0.032)
Married	-0.002	0.031	-0.017	-0.053
	(0.021)	(0.035)	(0.020)	(0.033)
Good health	-0.015	-0.031	-0.049	0.008
	(0.029)	(0.040)	(0.027)	(0.036)
Fin lit score	0.145***	0.146***	0.056***	0.051**
	(0.013)	(0.023)	(0.011)	(0.021)
Present pref	-0.038***	-0.037***	-0.023***	-0.020
	(0.007)	(0.012)	(0.007)	(0.011)
Income>natl median	0.057***	0.061	-0.001	0.040
	(0.022)	(0.038)	(0.020)	(0.033)
Paid attention	0.015	0.049	0.051***	0.086***
	(0.020)	(0.033)	(0.018)	(0.030)
Consistent	0.012	-0.030	-0.005	-0.075**
	(0.023)	(0.045)	(0.020)	(0.037)
Observations	2,269	818	2,263	804
Pseudo R-sq/R-sq	0.096	0.095	0.039	0.044
Dep. Var. Mean	0.539	0.567	0.741	0.755
Dep. Var. St. Dev.	0.499	0.496	0.438	0.43

Note: Table 3 presents average marginal effects from Logit regression of participants' propensity to recommend significant saving more or annuitizing more (versus choosing a lump-sum option at retirement), after seeing the savings or annuitization vignette, respectively. Key control variables include an indicator of having received the vignette first (before the survival probability questions), and treatment information provided (life expectancy vs. longevity treatment vs control). In addition, we control on age, sex, education, marital status, self-reported health, financial literacy, present preference score, income, a control for devoting sufficient attention to the survey, and COVID financial vulnerability and being consistent (see text). Results provided for the full sample and under-estimators (as indicated). Standard errors in parentheses. *** $p < 0.01$. ** $p < 0.05$

Online Appendix A: Descriptive Statistics

Table A1. Descriptive Statistics: Prolific Study

Variable	Obs	Mean	Std. Dev.	Min	Max
SLE LE	4516	0.171	0.304	-0.339	0.915
Sig increase savings	2550	0.527	0.499	0	1
Chose annuity	2542	0.739	0.439	0	1
Saw vignette before subj life expectancy	5108	0.432	0.495	0	1
Life expectancy treatment	5108	0.332	0.471	0	1
Longevity treatment	5108	0.334	0.472	0	1
Covid out of money	4542	0.214	0.296	0	1
Age	5103	48.981	9.274	35	83
Nonwhite	5108	0.174	0.379	0	1
Male	5108	0.437	0.496	0	1
CollegePlus	5108	0.607	0.488	0	1
Married	5108	0.585	0.493	0	1
Good health	5108	0.85	0.357	0	1
Fin lit score	5108	2.394	0.843	0	3
Present pref	5108	1.781	1.413	0	4
Income>Median	5108	0.463	0.498	0	1
Paid attention	5108	0.572	0.495	0	1
Consistent	5108	0.731	0.443	0	1

Note: *SLE-LE* measures the difference between the respondent's subjective versus objective survival probabilities. *Sig. increase savings* takes the value of 1 if the respondent recommended the vignette individual significantly increase savings, and *Chose annuity* is an indicator variable recommending that the vignette individual annuitize. Other variables include an indicator of having received the vignette before the survival probability questions, treatment condition (life expectancy vs. longevity), age, race, male, college +, being married dummy variable, self-reported health good/very good/excellent, financial literacy score, present preference score, income higher than national median, attention to survey, COVID financial vulnerability and being consistent (see text).

Appendix Table A2. Live to Age X and X-5 by Sex and Age

FILLS by AGE AND GENDER				
	Male		**Female**	
Age	*X*	*X-5*	*X*	*X-5*
35-39	55	50	60	55
40-44	50	45	55	50
45-49	45	40	50	45
50-54	40	35	45	40
55-59	35	30	40	35
60-64	30	25	35	30
65-69	25	20	30	25
70-74	20	15	25	20
75-79	15	10	20	15
80-84	15	10	15	10
85-90	10	5	10	5

Appendix Table A3. Overestimators vs. Underestimators

	Overestimators		**Underestimators**			
	Mean	Sd	Mean	Sd	Diff	t
Life expectancy treatment	0.336	0.472	0.337	0.473	0.002	(0.116)
Longevity treatment	0.345	0.475	0.317	0.466	-0.028	(-1.929)
Covid out of money	0.219	0.293	0.200	0.294	-0.020	(-2.103)
Age	48.219	9.130	50.003	9.070	1.784***	(6.432)
Nonwhite	0.187	0.390	0.120	0.325	-0.067***	(-6.290)
Male	0.442	0.497	0.446	0.497	0.004	(0.232)
CollegePlus	0.631	0.483	0.585	0.493	-0.046**	(-3.104)
Married	0.614	0.487	0.550	0.498	-0.064***	(-4.276)
Good health	0.907	0.290	0.754	0.431	-0.153***	(-13.166)
Fin lit score	2.395	0.837	2.515	0.751	0.120***	(5.026)
Present pref	1.746	1.430	1.770	1.399	0.024	(0.552)
Income>Median	0.487	0.500	0.410	0.492	-0.077***	(-5.101)
Paid attention	0.576	0.494	0.569	0.495	-0.007	(-0.473)
N	2753		1764		4517	

. *** p < 0.01. ** p < 0.05

Appendix Table A4. Impact on Difference between Subjective vs Life Table Survival Probability (*SLE-LE*): OLS Model, Prolific Sample, with Covid-19 Controls

	SLE-LE: (OLS) *Participants seeing vignette first*	*SLE-LE:* (OLS) *Full sample*
Saw vignette first		-0.053***
		(0.009)
Life expectancy treatment	0.013	0.010
	(0.017)	(0.011)
Longevity treatment	0.036**	0.026**
	(0.017)	(0.011)
Die from Covid	-0.000	-0.000**
	(0.000)	(0.000)
Get Covid	-0.000	-0.000
	(0.000)	(0.000)
Covid out of money	0.000	0.000
	(0.000)	(0.000)
Age	-0.001	-0.002***
	(0.001)	(0.001)
Non-white	0.076***	0.087***
	(0.019)	(0.013)
Male	-0.046***	-0.032***
	(0.014)	(0.010)
College-Plus	0.026*	0.011
	(0.016)	(0.010)
Married	-0.014	0.017
	(0.016)	(0.010)
Good health	0.147***	0.174***
	(0.021)	(0.014)
Fin lit score	-0.019**	-0.023***
	(0.010)	(0.006)
Present preferences	0.003	-0.000
	(0.005)	(0.003)
Income>natl median	0.034**	0.019
	(0.016)	(0.010)
Paid attention	0.029**	0.016
	(0.014)	(0.009)
Consistent	-0.140***	-0.128***
	(0.015)	(0.010)
Constant	0.140**	0.242***
	(0.064)	(0.038)
Observations	1,702	3,863
Pseudo R-sq/R-sq	0.116	0.121
Dep. Var. Mean	0.151	0.167

Dep. Var. St. Dev.	0.296	0.303

Note: *SLE-LE* measures the difference between the respondent's subjective versus objective survival probability. Column (1) includes only participants who saw the vignette (and hence received the informational interventions) before being asked about their subjective survival probabilities. Column (2) includes the full sample. Key control variables of interest include seeing the vignette first and the treatment information provided (life expectancy vs. longevity treatment) In addition, we control on age, sex, education, marital status, self-reported health, financial literacy, present preference score, income, attention to the survey, COVID financial vulnerability and probabilities of dying and getting COVID, and an indicator of consistency (those who understood the survival probability questions; see text). Standard errors in parentheses. *** $p < 0.01$. ** $p < 0.05$

Appendix Table A5: How Longevity and Life Expectancy Information Shape Financial Advice: Average Marginal Logit Effects, Prolific Sample, with Covid-19 controls

	Savings vignette		Annuitization vignette	
	(1) Full sample	(2) Under-estimators	(3) Full Sample	(4) Under-estimators
Saw vignette first	-0.001	0.066	-0.009	0.013
	(0.021)	(0.035)	(0.019)	(0.031)
Life expectancy treatment	-0.025	0.013	0.051**	0.105***
	(0.025)	(0.040)	(0.024)	(0.037)
Longevity treatment	-0.022	-0.032	0.018	0.086**
	(0.025)	(0.041)	(0.023)	(0.036)
Die from Covid	-0.119***	-0.145**	-0.098***	-0.011
	(0.039)	(0.065)	(0.035)	(0.058)
Get Covid	-0.078	-0.008	-0.086**	0.009
	(0.048)	(0.075)	(0.043)	(0.068)
Covid out of money	0.056	0.145	0.029	0.001
	(0.049)	(0.083)	(0.047)	(0.076)
Age	0.002	0.003	0.002	0.003
	(0.001)	(0.002)	(0.001)	(0.002)
Non-white	0.032	0.046	-0.003	-0.018
	(0.028)	(0.055)	(0.026)	(0.047)
Male	-0.048**	-0.035	-0.050**	0.019
	(0.021)	(0.034)	(0.020)	(0.032)
College-Plus	0.074***	0.068	0.011	0.001
	(0.022)	(0.036)	(0.021)	(0.033)
Married	0.008	0.032	-0.029	-0.067
	(0.022)	(0.036)	(0.021)	(0.034)
Good health	-0.032	-0.044	-0.052	0.008
	(0.031)	(0.043)	(0.029)	(0.039)
Fin lit score	0.151***	0.156***	0.050***	0.049**
	(0.014)	(0.024)	(0.012)	(0.022)
Present pref	-0.035***	-0.036***	-0.021***	-0.019
	(0.007)	(0.012)	(0.007)	(0.012)
Income>natl median	0.062***	0.071	0.001	0.052
	(0.022)	(0.039)	(0.021)	(0.034)
Paid attention	0.020	0.059	0.046**	0.098***
	(0.021)	(0.034)	(0.019)	(0.031)
Consistent	0.008	-0.035	-0.012	-0.074
	(0.024)	(0.046)	(0.021)	(0.038)
Observations	2,090	774	2,030	751
Pseudo R-sq/R-sq	0.098	0.100	0.039	0.05
Dep. Var. Mean	0.546	0.567	0.744	0.754
Dep. Var. St. Dev.	0.497	0.496	0.436	0.431

Note: Table 3 presents average marginal effects from Logit regression of participants' propensity to recommend saving significantly more or annuitizing more (versus choosing a lump-sum option at retirement), after seeing the savings or annuitization vignette, respectively. Key control variables include an indicator of having received the vignette first (before the survival probability questions), and treatment information provided (life expectancy vs.

longevity treatment vs control). In addition, we control on age, sex, education, marital status, self-reported health, financial literacy, present preference score, income, a control for devoting sufficient attention to the survey, COVID financial vulnerability and probabilities of dying and getting COVID as well as being consistent (see text). Results provided for the full sample and underestimators (as indicated). Standard errors in parentheses. *** $p < 0.01$. ** $p < 0.05$

Online Appendix B

Table B1. Prolific Survey of Financial Decision Making

Q1 Welcome to the research study!

This survey asks you some questions about how you think about your financial matters, including retirement planning and financial risks. The survey is aimed at people age 35 and over.

If you choose to participate in this study you will be asked to answer questions about financial terms, planning, risk, and related topics. You do not need any special financial information to take part in this study. We will also ask you a few general questions. You will not be asked to provide any identifying information about yourself. The survey will take approximately 20 minutes for which you will receive GBP 2.5 for participating.

Participation is voluntary and you have the right to withdraw from the study at any time without penalty. If you withdraw, you have the right to request that any information you supplied be erased. Once you have completed the survey, your data cannot be destroyed, as we store no personally identifiable information to ensure complete anonymity and confidentiality.

If you have any questions regarding the study, please contact the research staff:
Dr. Abigail Hurwitz
abigail.mimun@gmail.com
By selecting the checkbox you are giving your consent to participate in this study.
I consent, begin the study
I do not consent, I do not wish to participate

Q58 Please tell us a little about yourself:
Q4 What is your current age?

Q6 What is your gender?

- ○ Male
- ○ Female
- ○ Prefer not to say

Q8 What is the HIGHEST level of education that you have completed?

- ○ Less than high school
- ○ High school or GED
- ○ some college (including Associate degree)
- ○ Vocational or technical school
- ○ Completed College (Bachelor's degree)
- ○ Graduate school

Q9 Is English the main language that you speak at home?

- ○ Yes
- ○ Maybe
- ○ No

Q10 What is your marital status?

- ○ Married
- ○ Widowed
- ○ Divorced
- ○ Separated
- ○ Never married

Q7 Which of the following terms would you use to describe yourself?

- ○ White, Non-Hispanic
- ○ Hispanic or Latino
- ○ African American
- ○ Asian or Pacific Islander
- ○ Other (please specify) _____

Q11 The following questions relate to your health and expected longevity. Please answer them as best you can:
Q59 In general, would you say your health is:

- ○ Excellent
- ○ Very Good
- ○ Good
- ○ Fair
- ○ Poor

Q12 What is the percent chance [0-100] that you think you will live at least ${e://Field/AgeDeath} more years?

- ○ Percent chance _____
- ○ Don’t know
- ○ Refuse

Q14 And what is the percent chance [0-100] that you think you will live at least ${e://Field/AgeDeath2} more years?

- ○ Percent chance _____
- ○ Don’t know

- ○ Refuse

Q15 The next few questions are about your health care visits in the last 12 months:
Q60 (Not counting overnight hospital or nursing home stays) During the last 12 months, since January of 2019, how many times have you seen or talked to a medical doctor about your health, including emergency room or clinic visits?

- ○ 0
- ○ 1
- ○ 2-3
- ○ 4-5
- ○ 6-9
- ○ 10+

Q16 Did you take any prescription medications in the past 12 months, since January of 2019?

- ○ Yes
- ○ No
- ○ Don't know
- ○ Refuse

Q17 Over the last year, about how many different prescription medications did you take per month on average?

- ○ Prescriptions: _____
- ○ Don't know
- ○ Refuse

Q18 Over the last year, about how much money did you spend on prescription medication per month on average?

- ○ $ on prescription medications per month over the last year:
- ○ Don't know
- ○ Refuse

Q38 Next we will describe a financial decision facing Mrs. Smith and then we will ask you ask what you would recommend to this person:

Q62 Mrs. Smith is a single, 60-year-old woman with no children. She will retire and claim her Social Security benefits at 65. When she retires, she will have $100,000 saved for her retirement, and she will receive $1,400 in monthly Social Security benefits. Imagine that Mrs. Smith asks you about how to manage her $100,000 retirement savings. Please indicate which one of the two options you would recommend:

- ○ Withdraw the entire $100,000 all at once from the retirement account, to use as she needs.
- ○ Receive a regular monthly sum of $500 (equal to $6,000 yearly) for the rest of her life.

Q39 Just as before, Mrs. Smith is still a single, 60-year-old woman with no children who will retire and claim Social Security benefits at 65. When she retires, she will have $100,000 saved for her retirement, and she will receive $1,400 in monthly Social Security benefits.
But now she has a third option that she can choose from. Please indicate which one of the three options you would recommend:

- ○ Withdraw the entire $100,000 all at once from the retirement account, to use as she needs.
- ○ Receive a regular monthly sum of $500 (equal to $6,000 yearly) for the rest of her life.
- ○ Withdraw a lump sum of $50,000 at retirement, and receive a regular monthly sum of $250 (equals to $ 3,000 yearly) for the rest of her life.

Q46 Next we will describe a financial decision facing Mr. Smith and then we will ask you ask what you would recommend to this person:

Q70 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:

- ○ Withdraw the entire $100,000 all at once from the retirement account, to use as he needs.
- ○ Receive a regular monthly sum of $500 (equal to $6,000 yearly) for the rest of his life.

Q47 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:

- ○ Withdraw the entire $100,000 all at once from the retirement account, to use as he needs.
- ○ Receive a regular monthly sum of $500 (equal to $6,000 yearly) for the rest of his life.
- ○ 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.

Q64 Next we will describe a financial decision facing Mrs. Smith and then we will ask you ask what you would recommend to this person:
Q48 Mrs. Smith is a single, 60-year-old woman with no children. She will retire and claim her Social Security benefits at 65. When she retires, she will have $100,000 saved for her retirement, and she will receive $1,400 in monthly Social Security benefits.
Please note that an American woman, 65 years old, will survive 20.6 more years on average. Imagine that Mrs. Smith asks you about how to manage her $100,000 retirement savings. Please indicate which one of the two options you would recommend:

- ○ Withdraw the entire $100,000 all at once from the retirement account, to use as she needs.
- ○ Receive a regular monthly sum of $500 (equal to $6,000 yearly) for the rest of her life.

Q49 Just as before, Mrs. Smith is still a single, 60-year-old woman with no children who will retire and claim Social Security benefits at 65. When she retires, she will have $100,000 saved for her retirement, and she will receive $1,400 in monthly Social Security benefits.
Please note that an American woman, 65 years old, will survive 20.6 more years on average.

But now she has a third option that she can choose from. Please indicate which one of the three options you would recommend:

- ○ Withdraw the entire $100,000 all at once from the retirement account, to use as she needs.
- ○ Receive a regular monthly sum of $500 (equal to $6,000 yearly) for the rest of her life.
- ○ Withdraw a lump sum of $50,000 at retirement, and receive a regular monthly sum of $250 (equals to $ 3,000 yearly) for the rest of her life.

Q61 Next we will describe a financial decision facing Mr. Smith and then we will ask you ask what you would recommend to this person:

Q71 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 note that 22.3% of American men, 65 years old, will survive to the age of 90 or more.
Please indicate which one of these options you would recommend:

- ○ Maintain his current saving level.
- ○ Slightly increase his long-term savings by spending less.
- ○ Significantly increase his long-term savings by spending less.
- ○ Don't know

Q65 Next we will describe a financial decision facing Mrs. Smith and then we will ask you ask what you would recommend to this person:

Q52 Mrs. Smith is a single, 60-year-old woman with no children. She will retire and claim her Social Security benefits at 65. When she retires, she will have $100,000 saved for her retirement, and she will receive $1,400 in monthly Social Security benefits.
Please note that 33.2% of American women, 65 years old, will survive to the age of 90 or more. Imagine that Mrs. Smith asks you about how to manage her $100,000 retirement savings. Please indicate which one of the two options you would recommend:

- ○ Withdraw the entire $100,000 all at once from the retirement account, to use as she needs.
- ○ Receive a regular monthly sum of $500 (equal to $6,000 yearly) for the rest of her life.

Q53 Just as before, Mrs. Smith is still a single, 60-year-old woman with no children who will retire and claim Social Security benefits at 65. When she retires, she will have $100,000 saved for her retirement, and she will receive $1,400 in monthly Social Security benefits.
Please note that 33.2% of American women, 65 years old, will survive to the age of 90 or more.
But now she has a third option that she can choose from. Please indicate which one of the three options you would recommend:

- ○ Withdraw the entire $100,000 all at once from the retirement account, to use as she needs.
- ○ Receive a regular monthly sum of $500 (equal to $6,000 yearly) for the rest of her life.
- ○ Withdraw a lump sum of $50,000 at retirement, and receive a regular monthly sum of $250 (equals to $ 3,000 yearly) for the rest of her life.

Q59 Next we will describe a financial decision facing Mr. Smith and then we will ask you ask what you would recommend to this person:

Q72 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 note that an American man, 65 years old, will survive 18.1 more years on average.
Please indicate which one of these options you would recommend:

- ○ Maintain his current saving level.
- ○ Slightly increase his long-term savings by spending less.
- ○ Significantly increase his long-term savings by spending less.
- ○ Don't know.

Q50 Next we will describe a financial decision facing Mr. Smith and then we will ask you ask what you would recommend to this person:

Q73 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.
Please note that an American man, 65 years old, will survive 18.1 more years on average. 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:

- ○ Withdraw the entire $100,000 all at once from the retirement account, to use as he needs.
- ○ Receive a regular monthly sum of $500 (equal to $6,000 yearly) for the rest of his life.

Q51 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.
Please note that an American man, 65 years old, will survive 18.1 more years on average.
But now he has a third option that he can choose from. Please indicate which one of the three options you would recommend:

- ○ Withdraw the entire $100,000 all at once from the retirement account, to use as he needs.
- ○ Receive a regular monthly sum of $500 (equal to $6,000 yearly) for the rest of his life.
- ○ 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.

Q54 Next we will describe a financial decision facing Mr. Smith and then we will ask you ask what you would recommend to this person:

Q75 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.
Please note that 22.3% of American men, 65 years old, will survive to the age of 90 or more. 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:

- ○ Withdraw the entire $100,000 all at once from the retirement account, to use as he needs.
- ○ Receive a regular monthly sum of $500 (equal to $6,000 yearly) for the rest of his life.

Q55 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.
Please note that 22.3% of American men, 65 years old, will survive to the age of 90 or more.
But now he has a third option that he can choose from. Please indicate which one of the three options you would recommend:

- ○ Withdraw the entire $100,000 all at once from the retirement account, to use as he needs.
- ○ Receive a regular monthly sum of $500 (equal to $6,000 yearly) for the rest of his life.
- ○ 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.

Q57 Next we will describe a financial decision facing Mr. Smith and then we will ask you ask what you would recommend to this person:

Q74 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:

- ○ Maintain his current saving level.
- ○ Slightly increase his long-term savings by spending less.
- ○ Significantly increase his long-term savings by spending less.
- ○ Don't know.

Q50 Next we will describe a financial decision facing Mrs. Smith and then we will ask you ask what you would recommend to this person:

Q67 Mrs. Smith is a single, 40-year-old woman with no children. She will retire and claim her Social Security benefits at 65. When she retires, she will have $100,000 saved for her retirement, and she will receive $1,400 in monthly Social Security benefits.
Please indicate which one of these options you would recommend:

- ○ Maintain her current saving level.
- ○ Slightly increase her long-term savings by spending less.
- ○ Significantly increase her long-term savings by spending less.
- ○ Don't know.

Q58 Next we will describe a financial decision facing Mrs. Smith and then we will ask you ask what you would recommend to this person:

Q68 Mrs. Smith is a single, 40-year-old woman with no children. She will retire and claim her Social Security benefits at 65. When she retires, she will have $100,000 saved for her retirement, and she will receive $1,400 in monthly Social Security benefits.

Please note that an American woman, 65 years old, will survive 20.6 more years on average.
Please indicate which one of these options you would recommend:

- ○ Maintain her current saving level.
- ○ Slightly increase her long-term savings by spending less.
- ○ Significantly increase her long-term savings by spending less.
- ○ Don't know.

Q60 Next we will describe a financial decision facing Mrs. Smith and then we will ask you ask what you would recommend to this person:

Q69 Mrs. Smith is a single, 40-year-old woman with no children. She will retire and claim her Social Security benefits at 65. When she retires, she will have $100,000 saved for her retirement, and she will receive $1,400 in monthly Social Security benefits.
Please note that 33.2% of American women, 65 years old, will survive to the age of 90 or more.
Please indicate which one of these options you would recommend:

- ○ Maintain her current saving level.
- ○ Slightly increase her long-term savings by spending less.
- ○ Significantly increase her long-term savings by spending less.
- ○ Don't know.

Q61 Now we will ask you some questions about chances and probabilities. Please answer the following questions to the best of your ability and type your answer in numerals, not words (i.e., 12, not “twelve”):

Q66 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)?

- ○ Number of times: _____
- ○ Don’t know
- ○ Refuse

Q20 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)?

- ○ Number of times: _____
- ○ Don’t know
- ○ Refuse

Q21 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?

- ○ Number of people: _____
- ○ Don’t know
- ○ Refuse

Q23 Please tell us a little more about yourself:

Q76 Are you currently working for pay?

- ○ Yes
- ○ No

Q24 Do you currently have a bank saving or checking account?

- ○ Yes
- ○ No
- ○ Don’t know
- ○ Refuse

Q24 What is your best estimate of your household total monthly income?

- ○ $ per month: _____
- ○ Don’t know
- ○ Refuse

Q25 Including yourself, how many people living in your household are supported by this income?

- ○ Number of people: _____
- ○ Don’t know
- ○ Refuse

Q26 The next few questions ask you about your feelings about money now versus later

Q77 Would you rather win $20 now or $30 a year from now?

- ○ Win $20 now
- ○ Win $30 a year from now

Q27 Would you rather lose $20 now or $30 a year from now?

- ○ Lose $20 now
- ○ Lose $30 a year from now

Q28 Would you rather win $1,000 now or $1,500 a year from now?

- ○ Win $1,000 now
- ○ Win $1,500 a year from now

Q29 Would you rather lose $1,000 now or $1,500 a year from now?

- ○ Lose $1,000 now
- ○ Lose $1,500 a year from now

Q30 In the next few questions we ask you a few brain teasers and some factual questions. Please answer them to the best of your ability:

Q78 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

Q31 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

Q32 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

Q111 Which of the following statements comes closest to describing the amount of financial risk that you are willing to take when you save or make investments? **Please skip this question.**

- ○ I am willing to take substantial financial risks expecting to earn substantial returns
- ○ I am willing to take above average financial risks expecting to earn above-average returns
- ○ I am willing to take average financial risks expecting to earn average returns
- ○ I am willing to take below average financial risks expecting to earn below-average returns
- ○ I am not willing to take any risk, knowing I will earn a small but certain return

Q33 A bat and a ball cost $1.10 in total. The bat costs $1.00 more than the ball. How much does the ball cost?

- ○ $: _____
- ○ Don’t know
- ○ Refuse

Q34 If it takes 5 machines 5 minutes to make 5 widgets, how long would it take 100 machines to make 100 widgets?

- ○ Minute(s): _____
- ○ Don’t know
- ○ Refuse

Q37 Using the scale below, mark the box to the right that best describes how likely you would do the activities in the following statements:

	Very likely	Somewhat likely	Not Sure	Somewhat unlikely	Very unlikely
Eating ‘expired’ food products that still ‘look okay'	○	○	○	○	○
Frequent binge drinking (more than two drinks per day)	○	○	○	○	○
Ignoring a persistent physical pain by not going	○	○	○	○	○
Taking a prescription drug that has a high likelihood of negative side effects	○	○	○	○	○
Engaging in unprotected sex	○	○	○	○	○
Never wearing a seatbelt	○	○	○	○	○
Not having a smoke alarm in or outside of your bedroom	○	○	○	○	○
Regularly riding your bicycle without a helmet	○	○	○	○	○
Smoking a pack or more of cigarettes per day	○	○	○	○	○

Q108 Using the scale below, mark the box to the right that best describes how likely you would do the activities in the following statements:

	Very likely	Somewhat likely	Not Sure	Somewhat unlikely	Very unlikely
Investing 10% of your annual income in a moderate growth mutual fund (like a 401(k) or other retirement plan)	○	○	○	○	○
Betting a day's income at a high-stakes poker game	○	○	○	○	○
Investing 5% of your annual income in a very speculative stock (like a stock with high risk relative to any potential positive returns)	○	○	○	○	○
Betting a day's income on the outcome of a sporting event	○	○	○	○	○
Betting a day's income at the horse races	○	○	○	○	○
Investing 10% of your annual income in a new business venture	○	○	○	○	○

Q114 The coronavirus (COVID-19) is a new disease with flu-like symptoms that is spreading across the world. Have you heard of the coronavirus (COVID-19)?

- ○ Yes
- ○ No
- ○ Don't know

Q115 The coronavirus may cause economic challenges for some people regardless of whether they are actually infected. What is the percent chance you will run out of money because of the coronavirus in the next three months?

- ○ Percent chance: _____
- ○ Don't know
- ○ Refuse

Q119 On a scale of 0 to 100 percent, what is the chance that you will get the coronavirus in the next three months? If you're not sure, please give your best guess.

- ○ Percent chance: _____
- ○ Don't know
- ○ Refuse

Q116 If you do get the coronavirus, what is the percent chance you will die from it? If you're not sure, please give your best guess.

- ○ Percent chance: _____
- ○ Don't know
- ○ Refuse

Q36 Could you tell us how interesting or uninteresting you found the questions in this interview?

- ○ Very interesting
- ○ Interesting
- ○ Neither interesting nor uninteresting
- ○ Uninteresting
- ○ Very uninteresting

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