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Changes in Spending and Labor Supply in Response to
a Social Security Benefit Cut: Evidence from Stated Choice Data

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Abstract

We investigate how individuals in the U.S. expect to adjust their labor force participation and savings if Social Security benefits were cut by 30 percent. Respondents were asked directly what they would do under this scenario. Using the resulting stated choice data we find that respondents would on average reduce spending by 18.2 percent before retirement and 20.4 percent after retirement. About 34.1% of respondents state they would definitely work longer and they would postpone claiming Social Security by 1.1 years. We investigate how working longer and claiming Social Security later would compensate partially for the loss in benefits among the individuals who are currently working, under the assumption that individuals retire and claim at the same time. Individuals would increase their Social Security benefits from the post-reform level due to additional earnings entering the benefit calculation and a smaller early claiming penalty (or higher delayed claiming credit). As a result, the Social Security benefit people would receive would drop on average by 21 rather than 30 percent. Still, the net financial loss, even after accounting for additional earnings, is sizeable for individuals in the lowest wealth tertile.

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Highlights

- We investigate changes in labor supply and spending in response to a hypothetical Social Security reform scenario.

- We use stated choice data to identify what individuals would do in response to a 30 percent benefit cut.

- The majority of our respondents would adjust their behavior under the hypothetical scenario.

- Adjustments include reductions in spending before and after retirement and delayed Social Security benefit claiming.

- Working longer would compensate partially for the loss in benefits, yet there remains a sizeable financial loss.

1 Introduction

The U.S. Social Security trust fund (OASI) is predicted to be depleted by 2035 (Board of Trustees, 2016). Although there are several viable reform proposals to restore the Social Security system's long-term solvency, one important element that is critical to the success of any reform remains unknown: How will individuals respond, for example, to a cut in their Social Security benefits? Will individuals work longer or save more or both, and how much will their response make up for the cut in benefits? How would whatever individuals do to adjust be split across spending less and working longer?

It is important to understand how workers might respond to a benefit cut for at least two reasons. First, to evaluate the impact of such a benefit cut on the well-being of individuals (i.e., whether responses in behavior will be adequate to buffer the shortfalls in benefits and whether this would be the case across all groups of workers). Second, the response in individuals' behavior determines the size of benefit cuts required for ensuring the solvency of the Social Security program in the long-run. If all workers decided to work longer to make up for the shortfall in benefits, then Social Security revenues would increase more than if workers decided to make up for the shortfalls by reducing spending but otherwise sticking with their retirement (and likely their Social Security claiming) plans in the absence of reform. For some workers, additional Social Security contributions would only result in a minor increase in their annual Social Security benefits, whereas for others the increase in benefits would be larger, depending on the worker's earnings history.

Despite the relevance from a policy perspective of understanding individuals' behavior in such circumstances, relatively little is known about how people would adjust their behavior in case of a reform that would decrease their Social Security benefits. Workers have two main ways to respond: they can work longer and/or save more. In the absence of additional constraints, economic theory predicts that individuals should adjust both their saving behavior and the length of their working life (OECD, 2006; Martin and Whitehouse, 2008; Gruber and Wise, 2009; Sass et al., 2010; French and

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Jones, 2012). However, it has been difficult to show empirically how important each one of these dimensions is and how these two behaviors interact. Most studies focus on only one dimension of adjustment, either on the response to savings or on the response to labor force participation, but rarely on both.

Broadly speaking, there are three types of empirical studies on this topic: *within*-country studies, *cross*-country studies, and those adopting a structural approach. An important challenge for *within*-country studies is that there tends to be limited exogenous variation in Social Security rules that could be exploited. Examples of such studies, all focusing on labor supply, include Krueger and Pischke (1992) who investigate the effect of the 1977 amendment to the Social Security Act that sharply reduced benefits for some cohorts, Friedberg (2000) and Gruber and Orszag (2003) who use changes in Social Security rules to investigate the effect of the Social Security earnings test, or Mastrobuoni (2009) who investigates the impact of the increase in the normal retirement age. While those evaluate the impact of enacted reforms, for obvious reasons, policymakers are interested in empirical studies that would inform the design of a reform *before* enacting it. They therefore have to contend with evidence from other countries that have implemented reforms. Examples of studies that present evidence of this sort are Attanasio and Rohwedder (2003) for the United Kingdom, Attanasio and Brugiavini for Italy (2003), and Aguila (2011) for Mexico. Yet, differences in pre-reform institutional settings and preferences may limit what US policy makers can learn from what has happened in other countries.

Cross-country studies rely on variation in institutions, in particular retirement ages, and in pension formulas as exogenous variation to identify the effects of interest. Gruber and Wise (1999 and 2004) adopt this approach to study the impact on labor force participation while Samwick (2000) studies how the characteristics of social security systems influence savings. Hurd, Michaud and Rohwedder (2012) use institutional variation in public pension schemes across countries to study variation in wealth accumulation.

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Beyond within-country and cross-country studies, another way to assess individuals' responses to Social Security reform is to estimate a structural model on data of observed choices and conduct policy simulations. Examples of such policies include the change in the normal or early retirement age, benefits reduction, increase in payroll tax or health insurance provision (e.g., Blau and Gilleskie, 2006; Gustman and Steinmeier, 2007; van der Klaauw and Wolpin, 2008; Laitner and Silverman, 2012). While very powerful to simulate the behavioral impact of policies, the challenges of such structural models include computational complexities, taking into account institutional rules, typically unobserved (while complex) choice sets, and unobserved sources of uncertainty faced by decision-makers (e.g., Aguirregabiria and Mira, 2010). While the latter type of studies only take into consideration partial equilibrium effects, there are also a few studies looking at the impact of Social Security reforms within a general equilibrium framework (e.g., İmrohoroğlu and Kitao, 2009, 2012).

In this paper, we complement existing studies by adopting a different approach. We ask respondents directly what they will do in the case of a cut of 30 percent of their Social Security benefits: whether they would work longer, claim Social Security later, reduce spending before retirement, and/or reduce spending after retirement. (Answer categories were "definitely yes," "maybe," and "definitely not.") For each of these options, we follow up with questions to assess the size of the response. The advantage of this approach is that it allows us to investigate, without assumptions on individuals' decision-making process or their knowledge of the Social Security system, the behavioral response to a reform currently considered *before* its enactment. Responses are those reported by individuals who could be affected by this reform. Using respondents' stated choice, rather than actual choice, is becoming common in many fields (Louviere et al., 2000). Comparisons of revealed and stated preference data show that both data sets produced comparable utility parameters (e.g., Adamowicz et al., 1994, Ben-Akiva and Morikawa, 1990, Hensher and Bradley, 1993). Stated intention also relates strongly to subsequent actual choice (e.g., Haider and Stephens, 2007; Delavande and Manski, 2010). However, stated preferences data are not without

caveats and may be susceptible to biases. In particular, the context and format of the hypothetical setting have been found to affect the response, and choice model estimation results may therefore be sensitive to the elicitation format (Ben-Akiva et al., 1994).

The credibility of our results relies on individuals being able to predict how they would react to the hypothetical scenario. Whether stated preferences or stated choice questions will be successful in eliciting responses that are as close as possible to individuals' actual behavior depends critically on how salient the event is for respondents and on whether they have already considered the scenario as a real possibility (McFadden, 1998). Several arguments suggest that the scenario we consider was salient and realistic, especially at the time of the survey in 2007. The need for Social Security reform to restore the solvency of the program has been well advertised in the media and by political leaders for a number of years.[1] Time and time again, the message has been repeated that under current law, full benefits will only be payable until sometime in the 2030s; projections vary somewhat from year-to-year. After that, only about 75 percent of benefits will be payable given the current structure of the system. Importantly, workers' Social Security statements that were mailed out every year until 2011 included this same message in bold face, and there is evidence that individuals consult their Social Security statement (Mastrobuoni, 2011). Moreover, in our sample, respondents believe on average that there is a 61 percent chance that Congress will change Social Security sometime in the next 10 years so that it becomes less generous than it is currently.[2] We focus on a 30 percent cut because this was a plausible number discussed at the time of our survey. For example, in 2006, the Social Security Board of Trustees (2006) suggested either a payroll tax increase or a cut in Social Security benefits by 26 percent in 2040 (the estimated point of trust fund exhaustion at the time), with reductions reaching 30 percent in 2080. Finally, the

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[1] For example, then President Bush launched his initiative "Strengthening Social Security" in 2005.
[2] This statistic is computed for our analytical sample of respondents who are not receiving Social Security benefits at the time of the interview but report a positive probability of receiving Social Security benefit in the future (no weights applied).

credibility of our results also relies on whether individuals can forecast their Social Security benefits. There is evidence that the majority of people have relatively accurate expectations about their future Social Security benefits, and that the accuracy improves closer to retirement (Rohwedder and Kleinjans, 2006).

There has been other recent work using similarly stated choice data to look at retirement-related issues. For example, Luttmer and Samwick (2015) investigate the welfare loss faced by households due to political uncertainty associated with their future Social Security benefits. Like us, they ask survey respondents hypothetical questions about how they would change behavior (savings, labor supply, bequests) if their benefits could be guaranteed. Maurer et al. (2017) use a similar approach asking respondents to report their expected claiming age under various benefits payment options (e.g., lump sum). Michaud and van Soest (2008) investigate the impact of the 2000 repeal of the earnings test above the normal retirement age on retirement expectations (i.e., individual-specific subjective probability to work full-time past ages 62 and 65) of male workers. Van Soest, Kapteyn and Zissimopoulos (2007) investigate preferences for full and partial retirement by asking survey respondents to rate several hypothetical retirement trajectories involving early retirement, late retirement, and gradual retirement, each with its own corresponding income path. The major difference with respect to this literature is that we consider a different policy, that is realistic and salient for the sampled population: a 30% cut of Social Security benefits. Moreover, and importantly for policy, we can link these responses to the rich data elicited in the HRS, including linked Social Security earnings records which allow us to assess how individuals' behavioral response partially offsets the loss in benefits and to determine the actual change in the annual Social Security benefits post-reform.

We designed a survey module that elicited stated choice data from a subsample of respondents to the Health and Retirement Study (HRS) who were interviewed over the Internet in the summer of 2007. We link their answers to the rich background information collected in the HRS core survey and to administrative Social Security earnings records. About three quarters of our respondents report that they would

"definitely" adjust their behavior in the case of a 30 percent cut in their Social Security benefits. Thirty-six percent report that they would only reduce spending, while another 30 percent report that they would both work longer and reduce spending, underscoring the importance of considering these options jointly. At a qualitative level, we find important differences in the response by marital status, working status, and socioeconomic status (SES). Non-workers and those living in a couple are less likely to report that they would "definitely" work longer or reduce spending, while the opposite is true for those with lower education and those belonging to a lower wealth tertile.

We investigated the magnitude of the adjustment in terms of spending and find that respondents would on average reduce their spending by 18.2 percent before retirement, and by 20.4 percent after retirement. About two-thirds of the respondents who would consider reducing spending before retirement would start doing so immediately after the reform's enactment. We also conducted a more detailed quantitative analysis of respondents' answers about delaying their claiming of Social Security benefits. On average, Social Security claiming would be postponed by 1.08 years. We investigate how working longer and claiming Social Security later would compensate partially for the loss in benefits among the individuals who are currently working. If this time was spent working by everyone, then the annual Social Security benefit would be adjusted upward because of both the additional earnings and the fact that there would be less of an early claiming penalty or a higher delayed claiming credit.[3] Rather than experiencing a 30 percent drop in the annual benefit, respondents would experience a 21 percent drop on average when taking into account their adjustments to claiming later and working longer. Comparing the change in the present value of future Social Security benefits to the change in the present value of future earnings to assess the net financial effect we find a median net loss of $9,700 or 3.5 percent of median wealth holdings.

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[3] In the U.S. Social Security system, claiming benefits and retiring are separate decisions, although the majority of people do these simultaneously. We discuss the institutional features in more detail in Section 2.1.

The paper is organized as follows. We present the data and survey design in Section 2. We investigate the heterogeneity in the behavioral response to a Social Security reform by observable characteristics in Section 3. We then assess the magnitude of reductions in spending and labor supply increases in Sections 4 and 5 respectively. Section 6 compares the stated behavioral response from our study with findings from other studies. We conclude in Section 7.

2   Data: The HRS Internet Survey

The data on individuals' responses to a 30 percent Social Security benefit cut come from a module of the Health and Retirement Study Internet Survey, which is a supplementary survey of the HRS.[4] The HRS is a panel survey that is representative of the U.S. population ages 51 and over. In the core survey, the HRS collects data on close to 20,000 individuals and their spouses in about 13,000 households. Eligibility for the second wave of the HRS Internet Survey is determined by whether a respondent reports regularly using the Internet in the core survey in HRS 2004 or HRS 2006. A random subsample of 7,207 respondents qualified, but only 77.5 percent were invited to participate in the Internet Survey; the remainder of the sample was retained as a control group. The data for the second wave of the HRS Internet Survey was collected in two phases: the first part of the sample (34.4 percent or 1,919 respondents) was invited to participate in the spring of 2006 (Phase I) and the second part of the sample (65.6 percent or 3,667 respondents) was invited to participate in the summer of 2007 (Phase II). In both phases, the unit response rate, conditional on being invited to participate, was 70 percent. The stated choice module on Social Security reform was fielded in the second phase. We link the data from our module to the rich information available from the 2006 HRS core survey.

The subsample of the HRS Internet survey eligible to answer the module on stated choice is composed of respondents who at the time of interview did not yet receive

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[4] For more information see: http://hrsonline.isr.umich.edu/

Social Security benefits, but who reported a positive probability of receiving Social Security in the future. We discuss in Appendix A the representativeness of the HRS Internet sample and our stated choice sample compared to the entire HRS population.

2.1   Social Security Reform Scenario

The Old-Age, Survivors, and Disability Insurance (OASDI) program provides monthly benefits to qualified workers. Eligibility and benefit amounts are determined by the worker's contributions to Social Security. Eligible individuals can start claiming benefits as early as age 62, but doing so may result in a reduction of as much as 30 percent compared to retiring at the full retirement age (which is 66 for workers reaching age 62 in 2005 through 2016). Claiming after the full retirement age may result in larger benefits, with the largest benefits being reached when claiming at age 70. There is no means test to qualify for benefits, although there is a limit on income earned from working that applies to those under the full retirement age (Social Security Administration, 2017).

In our module, we ask respondents how they would respond to a 30 percent cut in Social Security benefits. In particular, we provide respondents with the following introduction:

In the next questions, we ask you to think about what you would do differently if everyone's Social Security benefits, including your own, were cut by 30 percent. Would you …?

This scenario was introduced after a sequence of questions about respondents' expectations of their future Social Security benefits (timing of claiming and monthly amounts).

A cut in Social Security benefits reduces eligible individuals' lifetime wealth. It also changes the marginal financial attractiveness of remaining at work. Within a life-cycle framework, we expect individuals to respond to such a reform by (i) working longer; and/or (ii) claiming Social Security benefits later; and/or (iii) reducing

consumption. Individuals could also decide not to do any of those adjustments for two distinct reasons: (i) they have already anticipated a reform and are currently optimizing their labor supply and consumption accordingly; (ii) they would spend down wealth faster without re-optimizing after the reform (and potentially leave fewer bequests). The latter case is consistent with various possibilities, including that individuals are close to subsistence consumption and cannot reduce it further, that bequests are accidental, or that re-optimizing retirement and consumption behavior is very costly (something ignored by a neo-classical life-cycle model).

We ask individuals whether they intend to engage in those behaviors should a reform be enacted. Figure 1 replicates the screen that respondents see on the survey and shows the various options presented to them: work longer (or return to work for respondents currently not working), claim Social Security benefits later, spend less before retirement or spend less after retirement, and spend the same as originally planned after retirement (and thereby spend down wealth faster). While not exhaustive, these options represent the primary behavioral changes implied by the simple life-cycle model.[5] All options deliberately appear on the same screen to ensure that respondents consider them jointly when answering. Respondents can answer "Definitely Yes," "Definitely No," or "Maybe" for each option. The answer "Maybe" is introduced to allow for the fact that some respondents might still be uncertain about what they will do, because their adjustment to a cut might depend on events that are not yet realized, such as health events, uncertainty about future earnings, stock market performance, or job loss.

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[5] Respondents could anticipate additional actions beyond those implied by the simple life-cycle model, such as changing the investment allocation of their portfolio. Even though these additional actions may be considered secondary in importance, the fact that we did not list other options or allow additional mentions means that the list is potentially incomplete.

Figure 1: Main Screen from the Internet survey asking about individuals' responses to a 30 percent Social Security benefit cut

In the next questions, we ask you to think about what you would do differently if everyone's Social Security benefits, including your own, were cut by 30 percent. Would you ?

	Definitely yes	Maybe	Definitely not
Work longer	○	○	○
Claim Social Security benefits later	○	○	○
Before retirement: spend less (and therefore save more)	○	○	○
After retirement: reduce spending	○	○	○
After retirement: spend the same as originally planned (and thereby spend down wealth faster)	○	○	○

Choose "Next" to continue or "Back" to go back.

Next   Back

An alternative design could have been to ask respondents to report the subjective probability that they would engage in each of these behaviors using a percent chance format. This would have facilitated the quantitative interpretation of the answers as respondents may use different mappings of the likelihood of an action into the three categories we offered. On the other hand, some respondents may have found the alternative design more complicated. In the end, due to time constraints in the survey and practical considerations at the implementation stage, we opted for this simpler design.

The hypothetical scenario of reform we present does not specify the outcomes of all potentially relevant events, so the scenario is incomplete (see Manski, 1999). This could

be problematic for the interpretation of results if respondents believed, for example, that the Social Security benefit cut posed in the scenario was related to or even induced by other adverse events, such as a general economic downturn. However, the survey we analyze took place in 2007, before the financial crisis, and at a time where the need for reform to make the program financially sustainable in the long-run was widely discussed by policy makers, in the media, and also pointed out in the Social Security statement that was sent annually to all workers age 25 and over. It therefore seems unlikely – even though not impossible – that people would ponder what other circumstances could bring about the hypothesized benefit cut and what additional behavioral responses might be called for.

For each option that involved a change in behavior and to which respondents answered "Definitely Yes" or "Maybe," we administered follow-up questions to elicit the magnitude of the adjustment that the respondent would envision:

- Work longer: *At what age would you expect to stop working*?
- Claim Social Security benefits later: *At what age would you expect to start collecting Social Security benefits?* We also designed a detailed visual elicitation of the subjective probability of claiming at various possible claiming ages. See Section 5 for details.
- Spend less before retirement: *Would you reduce your household spending immediately or wait a few years with this adjustment?* (Answer "reduce spending immediately" (Yes/No) and if not immediately, then "reduce spending in how many years"); *By how much would you reduce your household spending?* (answer in percent)
- Spend less after retirement: *By how much would you reduce your household spending in retirement compared to what you had anticipated it would be without the cut in Social Security benefits?* (answer in percent)

2.2   Analytical sample

Table 1 presents descriptive statistics of the 1,020 observations in the stated choice sample. About 39 percent of the respondents are male, and 81 percent are living in a couple household. Most of the respondents sampled are between the ages of 54 and 59 (57 percent). About 30 percent have some college education, and 43 percent have graduated from college. We define wealth tertiles by marital status using the whole 2006 HRS sample. As such, 25 percent of the respondents are in the lowest wealth tertile and 39 percent are in the highest wealth tertile. 83 percent of the respondents are currently working.

Table 1: Descriptive Statistics of the Stated Choice Sample

Variables	Percent
Male	38.7
Couple	81.3
Age <54	22.4
54-59	57.2
60 or older	20.5
Spouse's age	
> 1 year younger	20.7
within one year	23.4
> 1 year older	37.2
High school or less	26.8
Some college	30.3
College or more	42.8
Lowest wealth tertile	25.2
Second tertile	35.6
Highest tertile	39.2
Own health: fair or poor	9.0
Spouse's health: fair or poor	9.3
Work for pay (2007)	82.6
N	1020

Variables come from the 2006 core HRS, except age and work for pay that come from the 2007 HRS Internet.

2.3   Basic response patterns

Item non-response on any of the options asked on the first screen is very low: it is less than 3 percent throughout. Table 2 shows respondents' answers to the options "work longer" and "claim Social Security later." The vast majority of the population either said "definitely yes" or "maybe" to these two possible adjustments in response to a 30 percent cut in benefits. More said "definitely yes" to working longer" (34 percent) than to claiming Social Security later (20 percent). At the same time, a larger fraction would "maybe" claim Social Security later (59 percent compared to 50 percent for working longer). That leaves only a relatively small group who disregarded these adjustment options (21 percent for claiming later and 16 percent for working longer).

Table 2 distinguishes the response patterns for workers and non-workers as they are quite different. Those who are currently not working for pay are much less likely to answer "Yes" to "work longer" (14 percent compared to 38 percent for the workers) and to "claiming Social Security later" (8.5 percent compared to 22 percent for the workers).

Table 2: Response Patterns for Working Longer and Claiming Social Security Later, in Percent (N=1,003)

	YES	MAYBE	NO	Total
Work longer				
Workers	38.3	49.1	12.6	100.0
Non-workers	14.2	54.6	31.3	100.0
All	34.1	50.1	15.9	100.0
Claim Social Security later				
Workers	22.1	60.2	17.7	100.0
Non-workers	8.5	55.1	36.4	100.0
All	19.7	59.3	20.9	100.0

In addition, respondents who answered "Yes" or "Maybe" to one of these adjustments tended to provide "Yes" or "Maybe" to the other (Appendix Table 2). Similarly, respondents who answered "No" to one question were more likely to answer

"No" to the other. Only 7 percent of respondents said "No" to working longer and "Yes" or "Maybe" to claiming later.[6]

Table 3 shows the answers to the options "spending less before retirement" and "reduce spending" after retirement. Respondents were more likely to answer "Definitely Yes" to spending less in a longer time horizon, that is after retirement. Sixty percent of the respondents said "Definitely Yes" to reducing spending after retirement, compared to 41 percent to reducing spending before retirement. Like in the previous table, the difference in the answer patterns between spending less before or after retirement results mostly from complementary variation in the "Maybes" rather than from large differences in the "Nos." Note that the non-workers are more likely to state "No" regarding spending less before and after retirement than the workers.

Again, there is strong correlation in respondents' answers to the two options involving reductions in spending: Respondents who answered "Yes" or "Maybe" to spending less before retirement are more likely to answer "Yes" or "Maybe" to spending less after retirement (Appendix Table 3).

Table 3: Response Patterns for Reducing Spending, in percent (N= 995)

Spend less …	YES	MAYBE	NO	Total
Before retirement				
Workers	41.3	50.9	7.8	100.0
Non-workers	37.2	40.7	22.1	100.0
All	40.6	49.2	10.3	100.0
After retirement				
Workers	61.6	34.0	4.4	100.0
Non-workers	52.9	36.6	10.5	100.0
All	60.1	34.5	5.4	100.0

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[6] One may wonder how this subsample would finance spending if claiming Social Security later without working longer. Further investigations show that this group is not any more likely to have access to an employer pension compared to the remainder of the sample, but it is more likely to be in the highest wealth quartile (P-value=0.022).

If we compare Tables 2 and 3, we conclude that respondents are more likely to consider spending less as an option. For example, only 5 percent would definitely not reduce spending after retirement, compared to 16 percent who would definitely not work longer. Only 4.6 percent of the sample said "definitely yes" to the last option "after retirement: spend the same as originally planned (and thereby spend down wealth faster)," which offered another way of saying that the person will "do nothing" with respect to spending later in life. In the remainder of the paper we will focus the analyses on the first four options which describe whether respondents would adjust their behavior.

We are interested in examining all adjustments simultaneously. However, doing so is challenging because we are considering four different options (work longer, claim Social Security later, spend less before retirement, and spend less after retirement) and three answer categories (Definitely Yes, Maybe, Definitely No). This represents 81 possible combinations of answers. As noted earlier, the answers to working longer and claiming later are strongly correlated. Thus, to reduce the dimensionality, we combine them into one category, which we will refer to as "working longer." Similarly, we found that spending less before retirement is correlated with spending less after retirement, so we also combine them into a "spending less" category. Appendix Table 3 illustrates the definition of the new variables of interest. The variable "work longer" takes the value one, if the respondent answered "Definitely Yes" to either "work longer" or to "claim Social Security later," and the value zero otherwise. Similarly, the second variable "reduce spending" takes the value one if the respondent answered "Definitely Yes" to either "spend less before retirement" or to "reduce spending after retirement," and zero otherwise. We are then left with analyzing respondents' four possible options: only spend less, only work longer, do both or do neither.[7]

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[7] An alternative grouping to reduce dimensionality might have been to combine the "definitely yes" and "maybe" answers to indicate respondents' intentions. However, that would have classified 90% of the sample as intending to do both reduce spending and work longer/claim Social Security later, leaving little variation to study. See Appendix Table 5.

Table 4 shows the distribution of answers among these four options. The most frequent option is to only spend less, which is chosen by 36 percent of respondents, followed by doing both, which is chosen by 30 percent. The least preferred option is to only work longer (9 percent). More than a quarter of the respondents did not choose "definitely yes" for any of the four options. This includes respondents who reported "maybe" and who may then engage in this behavior since less than 2.1 percent reported "definitely no" to all adjustment behaviors. As noted earlier, non-workers are less likely to consider working longer (alone or jointly with spending less) as an option.

Table 4: Distribution of Responses to Working Longer and Reducing Spending, Reduced Dimensionality

	Workers		Non-workers		All		T-test*
Response	N	Percent	N	Percent	N	Percent	
Do neither	196	23.7	68	38.6	264	26.3	0.000
Work longer	78	9.4	7	4.0	85	8.5	0.019
Spend less	283	34.2	74	42.1	357	35.6	0.048
Do both	271	32.7	27	15.3	298	29.7	0.000
All	828	100.0	176	100.0	1,004	100.0	

* *P-value for t-test of equality between proportion of individuals working and not working*

3   Heterogeneity in qualitative response

The response to a cut in Social Security benefits is likely to vary by individual and household characteristics. We investigate this in a multivariate framework using a bivariate probit model. This approach accounts for the fact that the decisions of whether to work longer or whether to reduce spending are determined jointly. As before, the dependent variable "work longer" takes the value one if the respondent answered "Definitely Yes" to either "work longer" or to "claim Social Security later," and the value zero otherwise. Similarly, the second dependent variable "reduce spending" takes the value one if the respondent answered "Definitely Yes" to either "spend less before retirement" or to "reduce spending after retirement," and zero otherwise. In

addition to basic demographic characteristics, we include among the independent variables tertiles of Social Security wealth and of other wealth. Social Security wealth is constructed as the expected present value of future Social Security benefits derived from respondents' answer to the question, "How much do you expect your Social Security benefits to be?" Other wealth includes all bequeathable wealth, including housing, financial assets, other real estate, transportation, and business assets minus all debt. It does not include the value of Social Security and employer pensions. In addition to current wealth, we include the subjective probability of receiving a bequest in the next 10 years to capture a positive anticipated wealth shock. Some respondents may be unable to adjust their labor supply due to caring responsibilities, which we control for by the number of grandchildren and an indicator for a parent or parent-in-law alive. Finally, respondents were asked the subjective probability that over the next 10 years there would be changes to Social Security that will reduce their future benefits compared to what they would get under the current system. This captures to some extent whether respondents think that the presented scenario is likely to happen in the medium-run and potentially whether they have already made some adjustments.[8] About 30 percent of the respondents answered 50 percent, and 40 percent provided a probability greater than 50 percent. We include indicators of answers to this subjective probability as independent variables. Aside from age and work status, the dependent variables come from the HRS 2006 core survey, so the implicit assumption is that they have not changed between 2006 and 2007 when the Internet survey module took place. Table 5 shows the estimation results.

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[8] See Manski (2004) for an overview of the literature using subjective probabilities.

Table 5: Bivariate Probit Results for Working Longer and Reduce Spending

	Work longer		Reduce spending	
	Coefficient	*P-Value*	Coefficient	*P-Value*
Male	0.023	*0.817*	-0.183	*0.068*
Couple	-0.569	*0.000*	-0.286	*0.036*
Age <54	0.037	*0.757*	-0.156	*0.193*
55-59	(ref)			
60 or older	0.146	*0.205*	-0.046	*0.684*
Spouse's age				
> 1 year younger	0.380	*0.003*	0.102	*0.425*
within one year	(ref)			
> 1 year older	0.238	*0.062*	0.263	*0.033*
Not working	-0.658	*0.000*	-0.308	*0.007*
high school or less	0.043	*0.706*	0.293	*0.011*
some college	0.105	*0.307*	0.129	*0.209*
college or more	(ref)			
Social Security Wealth				
Lowest tercile	0.162	*0.147*	0.018	*0.869*
Second tercile	0.061	*0.565*	0.085	*0.422*
Highest tercile	(ref)			
Other Wealth				
Lowest tercile	0.489	*0.000*	0.289	*0.016*
Second tercile	0.166	*0.099*	0.192	*0.054*
Highest tercile	(ref)			
Own health: fair or poor	-0.219	*0.164*	-0.061	*0.691*
Spouse's health: fair or poor	0.007	*0.960*	-0.057	*0.697*
Probability own SS benefits cut				
< 50 %	(ref)			
50%	-0.097	*0.384*	0.143	*0.189*
> 50 %	0.170	*0.103*	0.359	*0.001*
Prob of receiving bequest in the next 10 years	0.002	*0.160*	0.000	*0.738*
Number of grandkids	-0.004	*0.756*	0.014	*0.317*
Has a parent alive or spouse has a parent alive	0.061	*0.587*	-0.006	*0.957*
Constant	-0.381	*0.017*	0.194	*0.229*

Number of observations = 982. Correlation between random terms ρ = 0.310 which is statistically significantly different from zero (P<0.000). Regression also included an indicator for missing values on Social Security wealth.

Married persons are less likely to state that they would work longer or reduce spending than single persons, suggesting that spouses may be able to insure each other against this financial shock. Note however that there is heterogeneity depending on the spousal age difference. Those who are married to a younger spouse are more likely to

state they would work longer compared to persons in couple whose spouse is of the same age. This is consistent with spouses enjoying retiring at the same time (e.g., Gutsman and Steinmeier, 2000), and may reflect the fact that individuals are prepared to work longer if their spouse is still attached to the labor market. We also find different behavioral responses for individuals with an older spouse compared to those whose spouse is of the same age. Contrarily to the idea of joint retirement, those are more likely to report they would work longer (coefficient statistically significant at 10 percent only), and reduce spending. This may be due to the fact that an older spouse (with a shorter work life and life time horizon) offers less of an "insurance."

Non-workers are less likely to report working longer as a response to a Social Security cut, which is plausible since they may have lost ties to the labor market. They are also less likely to report that they would reduce spending compared to workers. So overall, their behavior is less elastic. Persons who are financially constrained are less likely to be able to rely on their accumulated wealth to buffer this shock. Indeed, individuals in the lowest wealth tertile are more likely to state that they would work longer and reduce spending compared to those in the highest wealth tertile. Note also that persons with high school or less, and those with lower earnings on average who may have already anticipated a long working life, are more likely to report that they would reduce spending than persons with a college degree. Table 5 also shows that individuals who expect the chance of a Social Security reform to be greater than 50% are more likely to state they would reduce spending.

To assess the magnitude of the variation by characteristics, we compute the associated marginal effects. Figures 2 through 4 graphically show the marginal effects for the characteristics with significant coefficients in the regression. Each graph shows the likelihood relative to the reference group of the four combinations of the two binary outcomes: do neither, only work longer, only spend less, or do both. They illustrate that respondents largely make adjustments along both the working and the spending dimension, underscoring the importance of considering these dimensions jointly.

For example, in Figure 2, respondents in the lowest wealth tertile are 17 percent more likely to answer "definitely yes" both to working longer and spending less than the reference group, that is, people in the highest wealth tertile. Conversely, those in the lowest tertile are almost 13 percent less likely than the reference group to do neither. As expected, the response of those in the middle wealth tertile lies in between that of the lowest tertile and the reference group. Figure 3 shows that non-workers are 16 percent more likely to do neither compared to working respondents, and 18 percent less likely to adjust along both dimensions. Figure 4 contrasts the response of married persons to that of singles and shows that those who are married are substantially (20 percent) less likely than singles to state that they would adjust along both dimensions, working longer and spending less. Instead, they are 13 percent more likely to do neither and 10 percent more likely to state that they would spend less.

Figure 2: Marginal Effect of Wealth Tertile (Reference group: Highest tertile)
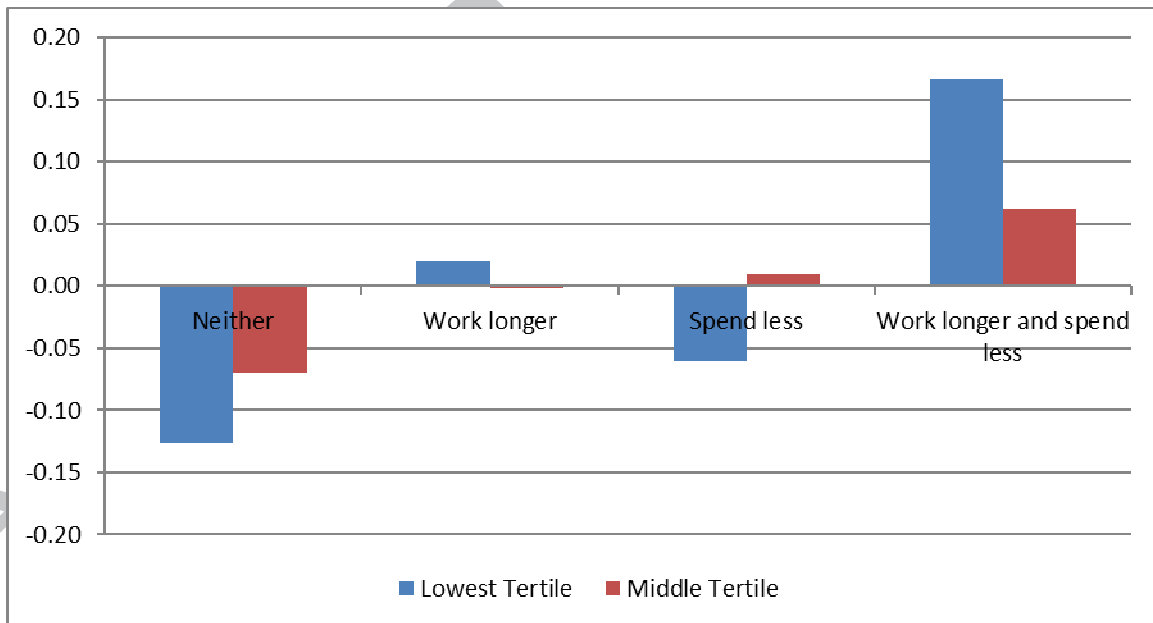
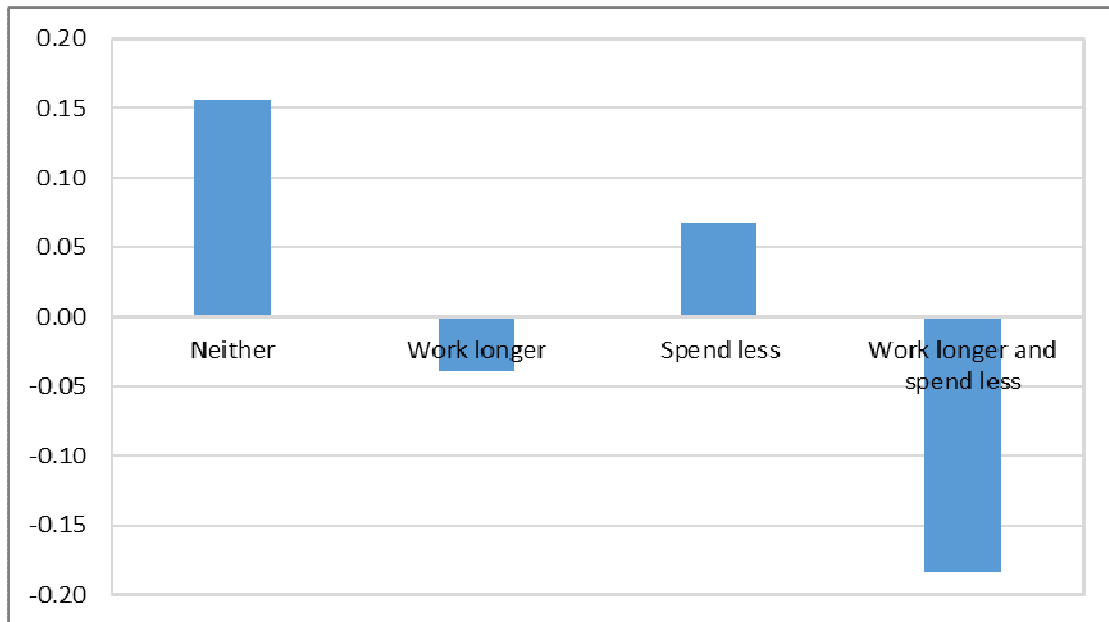Figure 3: Marginal Effect of Non-Workers compared to Workers (reference group)
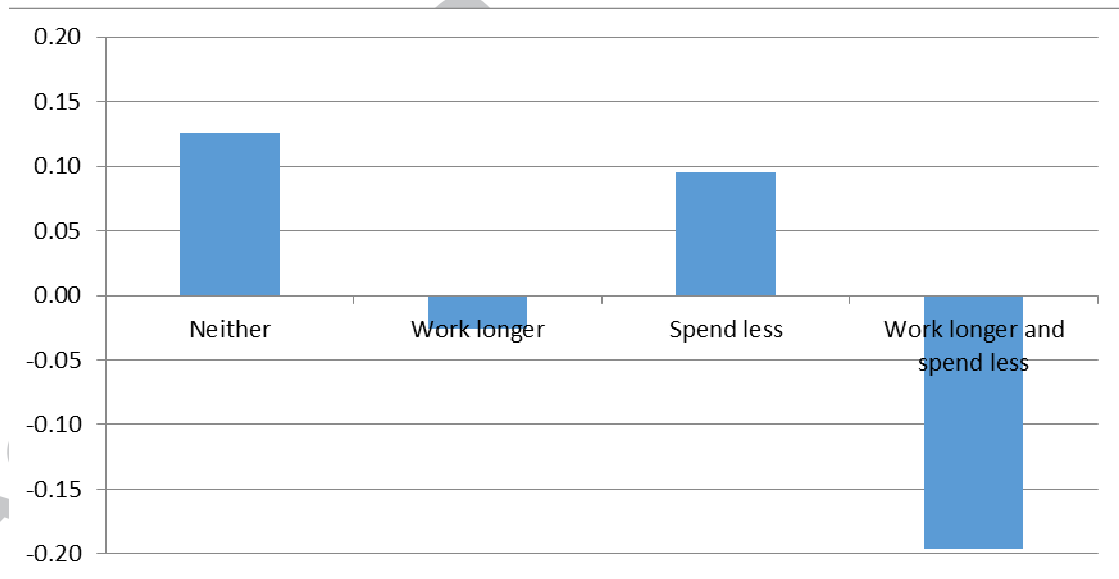

Figure 4: Marginal Effects for Married Persons compared to Singles (reference group)

In summary, we find that there is substantial heterogeneity in the qualitative response to a 30 percent Social Security benefit cut, notably by marital status, work status and socioeconomic indicators.

Table 4 shows that 26 percent of the sample simply expects to do nothing in response to a 30 percent cut in Social Security benefits, at least they state nothing definitive with respect to working longer or spending less and give "maybe" response at most. We have investigated some channels that may explain the lack of behavioral response: e.g., people who expect to leave a large bequest may just consider leaving a smaller bequest, or people may expect to rely on (more) transfers from relatives or provide less transfers to relatives. We cannot measure these aspects perfectly but we do not find any increased likelihood of reporting "do nothing" among those with a higher probability of leaving more than $100K of bequest, or among those who report a higher probability of receiving a bequest, or among those who gave or received a transfer or financial help from relatives (table not shown).

While we control for respondents being married and for spousal age difference, our analysis implicitly assumes that the decision-making is made at the individual level. However, for partnered persons, the relevant locus of decision may be the couple. We have 155 couples in our sample. It is unlikely that respondents have discussed with their spouse their answers to the survey so our stated choice data cannot fully capture the joint decision-making. Still, it may be illuminating to look in more detail at the behavioral responses of those individuals living in couples. We find that a majority of individuals in a couple are in agreement: 62 percent of couples agree on the work dimension (18 percent both stating they expect to work longer; 44 percent both stating they expect not to work longer) and 57 percent of couples agree on the spending dimension (42 percent both stating they would reduce spending, and 15 percent both stating they would not reduce spending). Appendix Table 6 is similar to Table 5 but the sample is restricted to individuals in couples for which both partners are in the sample. The specification now includes as covariates the spouse's response to the stated choice questions. Individuals are more likely to state they would be working longer if their spouse stated the same. We do not see any significant effect of a spouse stating that s/he would reduce spending.

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3   Quantitative assessment of the reduction in spending

Respondents who answered "Definitely Yes" or "Maybe" to the option "spend less before retirement" were asked whether they would reduce their household spending immediately or how many years they would wait to do so, and by how much they would reduce their spending (to be stated in percent). Those who answered "Definitely Yes" or "Maybe" to "reduce spending after retirement" were also asked by how much in percent they would reduce their spending. The rate of item non-response is very low on these follow-up questions (less than 1.5 percent). We use these responses to study the magnitude by which households indicate they would reduce spending and how these vary by characteristics.

Most respondents who state they would reduce spending before retirement report they would start the reductions immediately (almost two-thirds of the respondents). Among those who said "Definitely Yes" or "Maybe" to spend less before or after retirement, the most frequently reported reductions are 20 percent, 10 percent, and 30 percent. Overall, if we set to zero the reduction of respondents who would definitely not reduce their spending, we find that respondents would on average reduce their spending by 18.2 percent before retirement, and by 20.4 percent after retirement in response to a 30 percent cut of their Social Security benefits.

Respondents who answered "Definitely Yes" to reducing their spending both before and after retirement tend to report larger intended reductions in spending than those who said "Maybe," and they also tend to report that they will start decreasing spending earlier. Table 6 shows, for example, that the median of reported reductions among those who would "definitely" consider reducing their spending both before and after retirement is 20 percent for after retirement, while it is 15 percent for after retirement among those who would "Maybe" consider reducing both.

Table 6: Magnitude of Reduction in Spending

| | Before Retirement | | | | After Retirement | | |
| | In how many years start reductions | | Magnitude in percent | | Magnitude in percent | | |
	Median	Mean	Median	Mean	Median	Mean	N
Definitely yes to:							
Reduce both	0	0.98	20	21.31	20	23.59	351
Reduce before retirement only	0	1.15	20	18.40			53
Reduce after retirement only					20	23.40	247
None of the above							344
Total							*995*
Maybe to:							
Reduce both	0	2.69	20	19.48	15	18.33	247
Reduce before retirement only	0	2.45	20	21.32			242
Reduce after retirement only					15	17.72	96
None of the above							410
Total							*995*

To investigate how the magnitude of the reductions varies by characteristics, we conducted a multivariate analysis. Because reductions in spending before and after retirement are determined jointly, we estimate a model of two seemingly unrelated regressions (Zellner, 1962), with spending reductions before retirement, and spending reductions after retirement, as dependent variables. This model allows correlation between the random error terms of the two equations. Note that the earlier a household shifts to the lower spending path, the smaller the required percent reduction in annual spending to make up for the cut in Social Security benefits. The number of years over which spending reductions before retirement would be in effect varies across households. This is because some respondents said they would act immediately, while others said they would wait some years; furthermore, the time remaining until retirement varies with age and with the (anticipated) timing of retirement. To reflect this interaction, we multiply the annual percent reduction and the number of years that

the reduction would be in effect and use the result as the dependent variable.[9] For respondents who say that they will definitely not reduce spending before retirement, this dependent variable is set to zero. The mean cumulated reduction in spending over all the years before retirement corresponds to 173 percent of the current annual spending flow.[10] For the magnitude of the reduction in spending after retirement, we use the reported percent reduction directly as the dependent variable, assuming that the anticipated duration of retirement is about the same across households.[11]

Table 7 presents the estimation results. As in Table 5, the control variables come from the HRS 2006 core survey, with the exception of age, work status and Social Security wealth which are derived from the 2007 HRS Internet module. Consistent with the idea put forward earlier that spouses can insure each other, we find that being in a couple household is associated with a lower intended reduction in spending, both before and after retirement. The coefficients associated with wealth and education are statistically significant and indicate that those with fewer material resources or less human capital need to make larger adjustments: Individuals with high school or less or some college report a larger reduction in spending after retirement than those with college or more; those in the lowest wealth tertile report a larger magnitude of the reduction in spending, both before and after retirement compared to those in the highest tertile. As was found earlier, Table 7 shows that respondents who report a higher subjective probability of future Social Security benefits cuts also report a larger reduction in

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[9] To obtain the number of years that the reduction in spending will be in effect before retirement, we compute for each respondent the remaining number of years until retirement (given by the expected Social Security claiming age minus the respondent's current age) and subtract the number of years respondents stated they would wait until starting to decrease their spending. This computed number of years until the spending reduction would begin is negative for 11 respondents because of measurement error in at least one of the numbers used in the computation. For these 11 cases, we set the number of years to zero. One respondent reported a reduction in spending before retirement equal to 300 percent. We set this reduction to 100 percent.

[10] Note that a cumulative reduction of more than 100 percent of *annual* spending is feasible, because this is a measure of cumulative spending reductions over several years, but expressed in terms of the flow of annual spending.

[11] In principle, we could also multiply this number by the anticipated average number of years after retirement. However, this would call for computing the household's life expectancy, because spending is determined at the household level. So, we implicitly assume for simplicity that all respondents will have the same expected number of years after retirement. It is therefore just a constant multiplying the reported percent reduction in spending that we do not need to estimate.

spending before retirement. We do not find any difference by age in the expected reduction in spending after retirement but we see an age gradient before retirement, with younger persons expecting larger reductions. We would have expected the opposite since younger individuals have more time to make up for the future decline. Further examination of this finding reveals that it is driven by the fact that younger respondents have a (mechanically) larger expected number of years prior to retirement. There is no gradient by age in the reported percent reduction before retirement.

Table 7: Seemingly Unrelated Regression Results for Reduction in Spending Before and After Retirement

	Overall Reduction in Spending Before Retirement		Reduction in Spending After Retirement	
	Coefficient	P-Value	Coefficient	P-Value
Male	1.330	0.916	-1.914	0.042
Couple	-49.438	0.004	-2.988	0.019
Age <54	69.999	0.000	-0.011	0.992
54-59	(ref)		(ref)	
60 or older	-63.369	0.000	-1.217	0.257
Spouse's age				
> 1 year younger	4.767	0.771	-0.018	0.989
within one year	(ref)		(ref)	
> 1 year older	23.320	0.137	-0.402	0.730
Not working	-10.145	0.488	-1.438	0.187
High school or less	28.938	0.043	2.453	0.021
Some college	21.172	0.103	1.631	0.091
College or more	(ref)		(ref)	
Social Security Wealth				
Lowest tertile	22.643	0.107	2.425	0.020
Second tertile	1.576	0.906	1.555	0.118
Highest tertile	(ref)		(ref)	
Other Wealth				

Lowest wealth tertile	58.659	0.000	3.417	0.002
Second tertile	13.401	0.288	1.611	0.086
Highest tertile	(ref)		(ref)	
Own health: fair or poor	-29.642	0.127	0.030	0.983
Spouse's health: fair or poor	-2.380	0.897	1.892	0.166
Probability own SS benefits cut				
< 50 %	(ref)		(ref)	
50%	16.766	0.227	-0.369	0.721
> 50 %	41.332	0.002	1.595	0.103
Prob of receiving bequest in the next 10 years	0.028	0.858	0.007	0.541
Number of grandkids	0.412	0.810	0.243	0.056
Has a parent alive or spouse has a parent alive	12.127	0.388	-0.114	0.913
Constant	127.715	0.000	18.647	0.000

Number of observations = 957

4   Quantitative assessment of the response to delay claiming Social Security benefits

We now turn to quantifying individuals' response with respect to delaying claiming Social Security benefits. We focus on this particular aspect for two reasons. First, from the point of view of the Social Security program, changes in the timing of claiming Social Security affect the finances and cash flow of the Social Security program directly and are therefore important in understanding the implications of the reform scenario. Second, the data for measuring the size of the response are more detailed for the option "claim Social Security later" than for "working longer."

We asked respondents who answered "Definitely Yes" or "Maybe" to the option of claiming Social Security later (see Figure 1) for a point estimate of their revised expected claiming age and also for the probability distribution of claiming at various possible ages using an innovative visual design. These follow-up questions took the following format:

"You said that you would consider claiming Social Security benefits later than originally planned.

At what age would you expect to start collecting Social Security benefits if Social Security benefits were cut by 30 percent? _____

<next screen>

Often people are uncertain about when they will start collecting these benefits.

On the next screen we will show you 20 balls that you can put in eight different bins. Each bin stands for a particular age. Please put the balls in the bins to show the chances that you will start collecting at each age.

Figure 5 shows the screen where respondents allocate the balls across the various bins. We developed this innovative visual format to elicit individuals' entire probability distribution of beliefs for the realization of an event. (See Delavande and Rohwedder (2008) for a methodological assessment of this approach.) A main advantage of this approach is that respondents can provide the entire density distribution without having to be particularly proficient in the properties of probabilities. Respondents had a more detailed introduction to this "bins-and-balls" exercise earlier in the survey when we elicited the same detailed probability distribution of respondents' expected Social Security claiming age, but without the reform scenario. Appendix Figure 1 replicates the introduction to that earlier elicitation of individuals' entire distribution of claiming ages, and Appendix Figure 2 replicates the training example which we included at that time. As a result of these two elicitations—one without the reform scenario and one with the reform scenario—we have a prior and a posterior distribution for every respondents' subjective distribution of expected Social Security claiming ages. We use this information in three ways. First, we assess the aggregate response to the timing of Social Security claiming in the population. Second, we compute how much individual annual Social Security benefits change after taking into account that respondents might work longer and claim later. Finally, we approximate the net financial impact of the 30 percent benefit cut, taking into account the behavioral response to the reform scenario.

Figure 5: Bins-and-Balls Design for Eliciting Individuals' Probability Distribution of the Age at Which They Will Claim Social Security

4.1 Aggregate Effect on the Timing of Social Security Claiming

We compute the average distribution of claiming ages in the population with and without reform by averaging the number of balls in each bin over all respondents. We also include those respondents who indicated that they would definitely not claim Social Security later. For them we assign as the post-reform distribution of possible claiming ages the distribution that they gave when asked for their distribution without reform. In Figure 6, we have converted these population distributions into cumulative distributions. The posterior distribution is located to the right of the prior distribution, implying that at the population level, respondents have shifted their expected timing of claiming toward claiming later. Integrating over the area between the two distributions yields the size of the aggregate response, which amounts to a difference of 1.08 years in total. This implies that on average a 30 percent cut in Social Security benefits would prompt people to claim Social Security 1.08 years later.

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Figure 6: Expected Social Security Claiming Age: prior and post reform (N = 973)
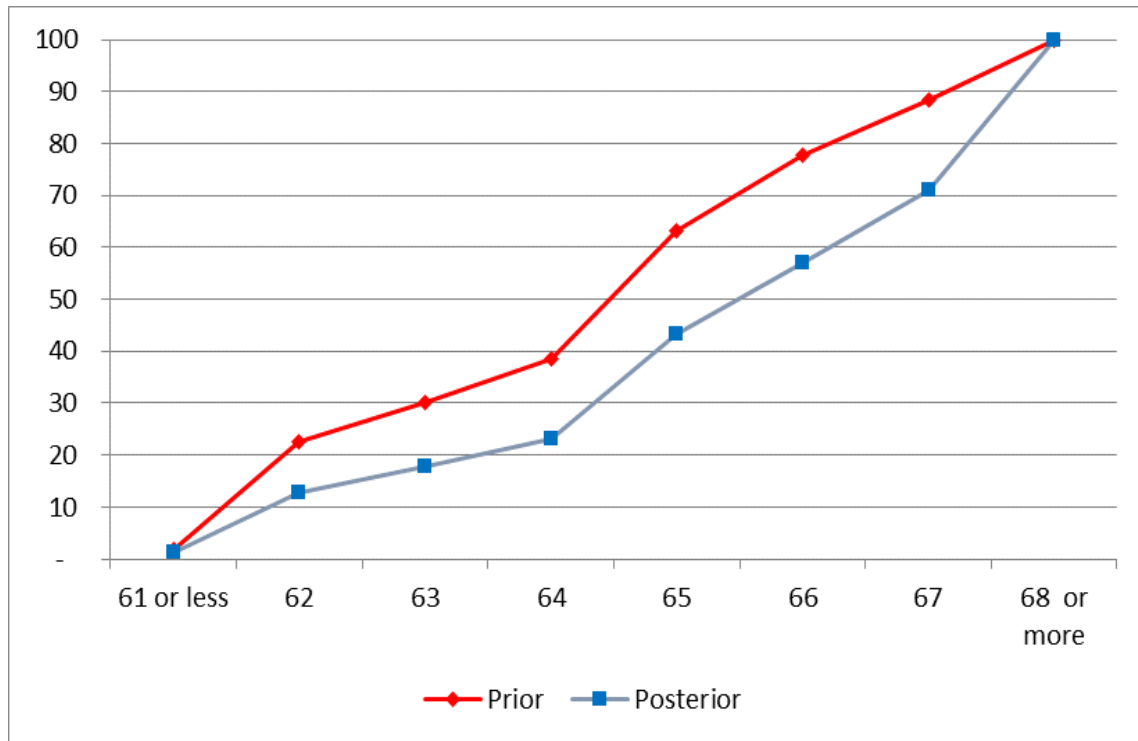
One question arises with respect to the group that said "Maybe" to the option of claiming Social Security benefits later: what did they assume when allocating the balls across the bins to indicate their revised distribution of expected claiming ages? Did they provide the distribution conditional on the event that they might postpone claiming so that we would need to know the chances that they would postpone for deriving the unconditional distribution, or did they provide the unconditional distribution in the first place? The question wording gave no indication that they should have given the conditional distribution. To shed light on this issue, we compared the difference between the prior and the posterior distribution of those who said "Definitely Yes" to that of those who said "Maybe." We find that the Yeses would postpone claiming by more than the Maybes (1.5 years versus 1.3 years).[12] We take this to suggest that

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[12] The difference is however not statistically significantly different from zero (P-value = 0.149).

respondents who answered "Maybe" did provide the unconditional distribution, which is what we assumed when constructing the aggregate distribution in Figure 6.

4.2   *Impact on respondents' annual Social Security benefit*

The 30 percent cut in benefits may be partially offset by respondents claiming and retirement behavior because of two effects: (1) additional earnings entering the calculations of benefits; and (2) a smaller early claiming penalty or a higher delayed claiming credit. In this section, we investigate the actual change in the annual Social Security benefits as a result of the reform, taking into account individuals' behavioral response. This is a simple and useful indicator for the impact of the reform scenario on long-term retirement security, because Social Security benefits pay a lifetime annuity that is indexed for inflation. As such, they provide a minimum consumption floor should the household run out of wealth during retirement. For this exercise, we restrict our sample to respondents who are currently working, because we do not observe the earnings of non-workers and lack information to infer their future labor force participation.

Because the majority of workers claim Social Security at the same time that they retire from their jobs (e.g., Coile et al., 2002), we assume that claiming Social Security later would also imply working longer by the same length of time. The size of the benefit increase resulting from additional earnings will vary across individuals because of differences in their earnings histories. For about half the sample, we are able to link respondents' data to their Social Security earnings records, thus allowing us to assess the impact additional earnings would have on their benefits.[13] Applying the exact Social Security formula to respondents' earnings histories, we compute each respondents'

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[13] The probability of a match with Social Security earnings records varies with some observable characteristics. For example, respondents in their early 60s are less likely to have a match and so are those in the highest wealth tertile. However, the means of outcomes of central interest to our analysis like the expected claiming age based on the bins-and-balls allocations, with and without reform, are not statistically different from each other for respondents with and without match to Social Security records. This finding is in line with results reported in Kapteyn et al. (2006) who compare subjective probabilities of working past 62 and past 65 in the HRS across those with and without match to Social Security earnings records.

Social Security benefit for each potential claiming age and weight the result by the respondents' subjective probability distribution of possible claiming ages using the prior distribution (i.e., without reform). This gives us the annual Social Security benefit the respondent would expect to receive *without* the reform scenario. In a second calculation, we reduce the Social Security benefit associated with each claiming age by 30 percent and weight these applying the posterior distribution of expected claiming ages (i.e., the distribution respondents gave under the Social Security reform scenario). This gives us the annual Social Security benefit that someone would expect to receive *with* the reform scenario (See the Appendix for details on the computation and underlying assumptions). We use the individuals' expected annual Social Security benefit with and without reform to compute the change ((SS with reform − SS without reform) / SS without reform). Respondents who said they would definitely not delay claiming Social Security benefits are assigned a benefit change of minus 30 percent.

Averaging this change over the entire population of workers (and not just those who considered delaying claiming), we find that individuals' annual Social Security benefit would be 21 percent lower on average once we take into account their response to the reform. In other words, individuals' response of working longer and claiming later would make up for about one third of the initial 30 percent cut in benefits. Investigating how much of this response can be attributed to additional earnings increasing the annual Social Security benefit, we find the answer is 34 percent. The remaining 66 percent of the response result from a smaller early claiming penalty or a larger delayed claiming credit.[14]

However, the average change in the annual Social Security benefit masks the substantial heterogeneity in the population. Table 8 shows the deciles of this metric. These span from minus 30 percent, pertaining to those who said they would definitely

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[14] More precisely, the 30 percent cut in annual Social Security benefits amounts to $5,877 on average, expressed in 2007 dollars. Taking into account the behavioral response, the average remaining cut amounts to $4,483. About 34 percent or $476 of this difference stems from additional earnings that increase the primary insurance amount (PIA), and the other 66 percent or $918 result from a smaller early claiming penalty or a larger delayed claiming credit.

not claim later, to minus 8 percent at the 90th percentile; the median is minus 23 percent.

Table 8:   Distribution of Changes in Annual Social Security Benefits Among Workers Taking into Account Individuals' Response to Reform

Percentile	Centile
10	-0.300
20	-0.300
30	-0.297
40	-0.264
50	-0.232
60	-0.205
70	-0.172
80	-0.139
90	-0.076

N= 370

Mean = -0.212

4.3   Overall net financial impact

Gauging the overall financial impact of the reform scenario is substantially more complex than what is captured in the metric of the change in the annual Social Security benefit. For example, the latter misses the fact that by claiming later the individual receives benefits for a shorter period of time. Then again, working longer will give the individual additional earnings that can finance consumption instead and possibly add to savings at the same time. Mortality risk is not accounted for either. We therefore compare the present value of the sum of future earnings and future Social Security benefits with and without reform. Note that taxes—Social Security and income taxes— also affect the overall financial effect of the reform, but in a complex manner. We do not take these into account in our assessment of the net financial impact, because their analysis requires information on the response of other household members that we do

not have.[15] As in Section 4.2, our analysis is restricted to individuals who are currently working.

In the present value calculations, we assume a real rate of return of 3 percent and a rate of inflation of 2 percent. Note that taking differences of variables that are measured with error tends to amplify the measurement error. We therefore focus our analysis on median values for this exercise. Table 9 shows the results in thousands of 2007 dollars, for the entire sample of working respondents for whom we have matched Social Security records and also by wealth tertiles.[16]

Overall, the reform scenario—after accounting for the behavioral response of working longer—would reduce the present value of future Social Security benefits by $57,000 (median reduction). Additional earnings from working longer—about $33,000 at the median in present value terms—make up for some of these losses. Computing the net effect for each respondent, we find that the median remaining loss is just under $10,000, which corresponds to 3.5 percent of median bequeathable wealth ($277,000) in this population.[17]

When comparing the effect across wealth tertiles, we find that the net financial effect is not all that different, ranging between $-6,400 and $-15,200. To gauge whether these amounts represent big losses, we set them in context with the households' balance sheets and compare them to median wealth levels within the wealth tertiles that we used for stratification in Table 9. For people in the lowest wealth tertile, the median net financial loss amounts to as much as 19 percent of median total wealth holdings, whereas for the middle and highest wealth tertile, the net financial loss is much smaller in comparison with total wealth (5 percent and 1 percent, respectively).

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[15] For example, income taxes owed before and after retirement would also be affected by the Social Security reform scenario. But assessments of taxes that the household owes would need to take into account the spouse's income history which we may not know, nor do we know how many of the spouses would respond to the Social Security reform scenario, because they did not participate in the Internet survey.

[16] Wealth tertiles are computed separately for singles and couples to account for the fact that couple households have much higher wealth holdings than singles. We also checked for variation in wealth by age band, but found that it is not that strong, especially since 80 percent of our sample are in their 50s.

[17] Bequeathable wealth (RAND HRS variable "H8ATOTB") includes housing, real estate, transportation, business, net financial assets such as individual retirement accounts (IRAs), stocks, bonds, checking, and debt.

Table 9: Net Financial Impact of Reform Scenario, medians in thousand [2007] dollars (N=375)

Wealth Tertile	Difference in Present Value of Future SS Benefits	Difference in Present Value of Future Earnings	Net Financial Impact [*]	Total Bequeathable Wealth
Lowest	-48.7	28.4	-9.7	49.9
Middle	-57.1	31.0	-15.2	291.3
Highest	-63.3	60.3	-6.4	916.0
All	-56.9	32.6	-9.7	277.0

[*] The net effect is computed at the respondent-level as the sum of the difference in the present value of future Social Security benefits and the difference in the present value of future earnings.

5   Comparison with existing studies

Our stated choice analysis relies on the assumption that respondents are able to accurately predict what they would do under the hypothetical scenario. To further examine the credibility of this assumption, we compare our results to those found by other studies investigating the impact of a Social Security reform using relatively recent cohorts. This exercise provides solely suggestive evidence as it is hard to make precise comparisons between existing studies and ours due to different sample selection, timing, places and the set of reforms considered. For example, our analytical sample is restricted to respondents who report a positive probability of receiving Social Security benefit in the future. No other study would have a directly comparable study sample. Nevertheless the comparisons with the findings from other studies suggest that the behavioral responses provided by our respondents are plausible.

We start our comparison with US-based studies. Van der Klaauw and Wolpin (2008) estimate a dynamic programming model taking into account Social Security rules, borrowing constraints, uncertain health and survival, Medicare, and health insurance

and simulate the impact of various changes in Social Security rules on saving and labor supply. One of the changes they investigate is a 25 percent and a 50 percent cut of Social Security benefits which is similar to our scenario of a 30 percent benefit cut. They look at the immediate impact had a reform been implemented in 1992 and implications over the following 15 years for a sample of low income-households (i.e., those who do not expect to collect a defined benefit pension plan from a previous job). The total increase in average hours worked due to a 50 percent cut amounts roughly to an additional year of work for married couples aged 51-61 in 1992, 4.7 months for the single men aged 51-61 in 1992, and 2.4 months for the single women aged 51-61 in 1992.[18] This is somewhat less than what respondents report given that we consider a 30 percent cut.

French (2005) estimates a structural life cycle model of labor supply, retirement and savings in which future health and wages are uncertain, and taking into consideration borrowing constraints. He uses data from the Panel Study of Income Dynamics and therefore looks at adjustments over the entire life cycle. He simulates the impact of a 20% Social Benefits cut on labor supply and assets. Such a reduction delays exit from the labor market by three months over the entire sample. However, he notes that most of the labor supply response would be after the age of 62. This is therefore not inconsistent with the larger effect we find given that our sample is older and that we look at a 30% cut. Interestingly, he notes that the increased years in the labor market after age 62 replaces about 21% of the lost income due to the cut, which is what we find in our sample.

Mastrobuoni (2009) looks at the impact of the increase in the normal retirement age (NRA) of 2 months per year implemented for cohorts born in 1938 and after. Each two months increase of the NRA represents roughly a 1 percentage point reduction in Social Security benefits and is found to lead to a one-month delay in retirement. This is a

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[18] These numbers are computed using the average increase in total hours worked reported by Van der Klaauw and Wolpin (2008), from table 11 divided by the annual baseline hours worked from tables 8 to 10 for married couples, single males, and single females, respectively. Because the average increase is computed over all age groups while the increase in annual baseline hours is taken from the 51-61 year-olds, these reported results constitute a lower bound.

larger effect than what we find since a 30 percent cut lead to a delay of 13 months. Note however, that there may be framing effects associated with claiming at the time of the NRA, therefore magnifying the effect of the reform (Brown et al., 2011; Behagel and Blau, 2012; Liebman and Luttmer, 2012). In particular, Behagel and Blau (2012) develop a model of retirement that incorporates reference dependence (the reference being the NRA) and loss-aversion and show that, under plausible parameters, a reform framed as an across-the-board cut irrespective of claiming age (i.e., like the one we consider in our hypothetical scenario) would increase retirement age less than one increasing the age at which a given reference benefit level is available (i.e., the one implemented in the US).

In the German context, Haan and Prowse (2014) use a dynamic structural model to understand the relationship between life expectancy, the public pension system and individuals' employment, retirement and consumption decisions over the life-cycle, and look at reforms designed to cope with the fiscal challenges posed by increasing life expectancy. They find that a 26.8 percent cut in the per-year value of public pension benefits (a cut that would neutralize the effect of a 6.4 year increase in age 65 life expectancy on the Government's deficit) would increase retirement age by 1.21 years on average, which is very close to what we find.

6 Conclusions

Social Security is the most important source of retirement income for a large fraction of the population. Any prospective Social Security reform to return the program to long-term solvency is likely to involve benefit cuts of some form or another. In this paper, we investigated how individuals in their 50s and 60s would change their spending and/or labor supply if everyone's Social Security benefits were cut by 30 percent. In the absence of data on actual Social Security benefit cuts in the U.S. to identify how people would respond, we asked individuals to tell us what they would to do under such a reform scenario. We find that three quarters of our respondents report that they would "definitely" adjust their behavior in the event of a benefit cut. A little over a third report that they would only reduce spending, while another thirty percent report that they

would both work longer and reduce spending. About 9 percent would only consider working longer as a response to the cut in benefits. There is substantial heterogeneity in the response by marital status, work status, education and wealth.

In terms of magnitude, we find that respondents would on average reduce their spending by 18.2 percent before retirement, and by 20.4 percent after retirement, in response to a 30 percent Social Security benefit cut. As for delaying their claiming of Social Security benefits, we find that Social Security claiming would be postponed by 1.08 years on average. We investigate how working longer and claiming Social Security later would compensate partially for the loss in benefits among the individuals who are currently working under the assumption that individuals retire and claim at the same time. We find that respondents would experience on average a 21 percent drop rather than the 30 percent drop in the annual benefits. A more comprehensive analysis of the net financial effect compares the change in the present value of future Social Security benefits to the change in the present value of future earnings. It implies a median net loss of $9,700 or 3.5 percent of median wealth holdings. Examining how this effect varies by wealth reveals that individuals in the lowest wealth tertile would face a net loss that amounts to almost 20 percent of median total wealth holdings in that group. The net loss is much smaller in relation to wealth holdings for the second and third wealth tertile (5 and 1 percent of median wealth holdings, respectively).

The results of this study provide unique information on individuals' responses to a Social Security reform that would implement a 30 percent cut in benefits. Because our estimates are not based on data from empirical observations of actual choices in a realized scenario, but instead on respondents' stated choices about a hypothetical scenario, there remains uncertainty as to how closely these stated choices reflect actual behavioral responses. The high saliency of the Social Security reform scenario that we pose to respondents should alleviate this concern. Our results based on stated preferences therefore complement existing studies based on revealed preferences.

Acknowledgements

References

Data

Health and Retirement Study, wave 2006, public use dataset. Produced and distributed by the University of Michigan with funding from the National Institute on Aging (grant number NIA U01AG009740). Ann Arbor, MI.

Health and Retirement Study, 2007 Internet Survey. Produced and distributed by the University of Michigan with funding from the National Institute on Aging (grant number NIA U01AG009740). Ann Arbor, MI.

RAND HRS Data, Version H. Produced by the RAND Center for the Study of Aging, with funding from the National Institute on Aging and the Social Security Administration. Santa Monica, CA (February 2008).

Research Studies

Adamowicz W, J. Louviere, M. Williams, 1994. "Combining stated and revealed preference methods for valuing environmental amenities," *Journal of Environmental Economics and Management*, 26, 271-292.

Aguila, Emma, 2011. "Personal Retirement Accounts and Saving," *American Economic Journal: Economic Policy*, 3(4), 1-24.

Aguirregabiria, Victor and Pedro Mira, 2010. "Dynamic discrete choice structural models: A survey," *Journal of Econometrics*, 156(1), 38–67.

Attanasio, Orazio P. and Susann Rohwedder, 2003. "Pension Wealth and Household Saving: Evidence from Pension Reforms in the U.K.," *American Economic Review*, 1499-1521.

Attanasio, Orazio P. and Agar Brugiavini, 2003. "Social Security And Households' Saving," *The Quarterly Journal of Economics*, 118(3), 1075-1119.

Behaghel, Luc, and David M. Blau, 2012. "Framing Social Security Reform: Behavioral Responses to Changes in the Full Retirement Age," *American Economic Journal: Economic Policy*, 4(4): 41-67.

Ben-Akiva, M.E. and Morikawa, T., 1990. "Estimation of switching models from revealed preferences and stated intentions," Transportation Research A 24A(6): 485-95.

M. Ben-Akiva, M. Bradley, T. Morikawa, J. Benjamin, T. Novak, H. Oppewal, V. Rao., 1994. "Combining Revealed and Stated Preferences Data," *Marketing Letters*, 5(4): 335-349.

Blau, D.M., Gilleskie, D.B., 2006. "Health insurance and retirement of married couples," *Journal of Applied Econometrics* 21, 935–953.

Board of Trustees. 2006. "The 2006 Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and Federal Disability Insurance Trust Funds," Washington, D.C., Social Security Administration.

Board of Trustees. 2016. "The 2016 Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and Federal Disability Insurance Trust Funds," Washington, D.C., Social Security Administration.

Brown, Jeffrey R., Arie Kapteyn and Olivia S. Mitchell, 2011. "Framing Effects and Expected Social Security Claiming Behavior," NBER Working Papers 17018.

Coile, Courtney C., Peter Diamond, Jonathan Gruber, and Alain Jousten. "Delays in Claiming Social Security Benefits." *Journal of Public Economics*, 84(3): 357-385, 2002.

Delavande, A. and C. Manski, 2010. "Probabilistic Polling and Voting in the 2008 Presidential Election: Evidence from the American Life Panel," *Public Opinion Quarterly*, 74 (3): 433-459.

Delavande, Adeline and Susann Rohwedder, 2008. "Eliciting Subjective Probabilities in Internet Surveys," *Public Opinion Quarterly*, 72: 866–891.

Friedberg, Leora, 2000. "The Labor Supply Effects of the Social Security Earnings Test," *The Review of Economics and Statistics*, 82 (1), 48-63.

French, E., 2005. "The effects of health, wealth and wages on labor supply and retirement behavior," *Review of Economic Studies*, 72, 395–427

French, Eric and John Jones, 2012. "Public Pensions and Labor Supply over the Life Cycle," *International Tax and Public Finance*, 19(2), 268-87.

Gruber, Jonathan and Peter Orszag, 2003. "Does The Social Security Earnings Test Affect Labor Supply And Benefits Receipt?" *National Tax Journal*, v56 755-773.

Gruber, Jonathan and David A. Wise, eds., 1999. Social Security and Retirement Around the World, Chicago: University of Chicago Press.

Gruber, Jonathan and David A. Wise, eds., 2004. Social Security Programs and Retirement Around the World: Micro-Estimation, Chicago: University of Chicago Press.

Gruber, Jonathan, and David A Wise, eds., 2009. Social security programs and retirement around the world: Fiscal implications of reform: University of Chicago press.

Gustman and Steinmeier, 2007. "Projecting Behavioral Responses to the Next Generation of Retirement Policies," NBER Working Paper No. 12958.

Haan, Peter and Victoria Prowse. 2014. "Longevity, life-cycle behavior and pension reform." *Journal of Econometrics* 178, 582–601.

Haider, Steven J., and Melvin Stephens, Jr., 2007. "Is there a retirement-consumption puzzle? Evidence using subjective retirement expectations," *Review of Economics and Statistics*, 89(2): 247-269.

Hensher, D.A. and Bradley, M., 1993. "Using stated response choice data to enrich revealed preference discrete choice models," *Marketing Letters* 4(2): 139-51.

Hurd, Michael D., Pierre-Carl Michaud and Susann Rohwedder, 2012. "The Displacement Effect of Public Pensions on the Accumulation of Financial Assets," *Fiscal Studies,* 1; 33(1): 107–128.

İmrohoroğlu, Selahattin and Sagiri Kitao, 2009. "Labor supply elasticity and social security reform," *Journal of Public Economics*, 867–878.

İmrohoroğlu, Selahattin and Sagiri Kitao, 2012. "Social Security Reforms: Benefit Claiming, Labor Force Participation, and Long-run Sustainability," *American Economic Journal: Macroeconomics*, 4(3): 96–127.

Kapteyn, Arie, Pierre-Carl Michaud, James P. Smith and Arthur van Soest, 2006. "The Effects of Attrition and Non-Response in the Health and Retirement Study," RAND Working Paper WR-407.

Rohwedder, Susann and Kristin Kleinjans, 2006. "Dynamics of Individual Information about Social Security," mimeo.

Krueger, Alan, and Jorn-Steffen Pischke, 1992. "The Effect of Social Security on Labor Supply: A Cohort Analysis of the Notch Generation," *Journal of Labor Economics*, 19(4): 412-37.

Laitner John and Dan Silverman, 2012. "Consumption, Retirement and Social Security: Evaluating the Efficiency of Reform that Encourages Longer Careers," *Journal of Public Economics*, 96(7-8), 615-634.

Liebman, Jeffrey B and Erzo F.P Luttmer, 2012. "The Perception of Social Security Incentives for Labor Supply and Retirement: The Median Voter Knows More Than

You'd Think" (with Jeffrey B.), *Tax Policy and the Economy*, Volume 26 , edited by Jeffrey R. Brown, University of Chicago Press, pp. 1-42.

Louviere, J., D. Hensher and J. Swait, 2000. *Stated Choice Methods: Analysis and Applications*. Cambridge University Press.

Luttmer, Erzo F.P and Andrew A. Samwick, 2015. "The Costs and Consequences of Perceived Political Uncertainty in Social Security," NBER Working Paper No. 21818.

Manski, Charles F., 1999. "Analysis of Choice Expectations in Incomplete Scenarios," *Journal of Risk and Uncertainty*, 19:1-3; 49-65.

Manski, Charles F., 2004. "Measuring Expectations," *Econometrica* 72(5): 1329-76.

Mastrobuoni, Giovanni, 2009. "Labor supply effects of the recent social security benefit cuts: Empirical estimates using cohort discontinuities," *Journal of Public Economics* 93, 1224–1233.

Mastrobuoni, Giovanni, 2011. "The role of information for retirement behavior: Evidence based on the stepwise introduction of the Social Security Statement," *Journal of Public Economics* 95, 913–925.

Maurer, Raimond, Olivia S. Mitchell, Ralph Rogalla, Tatjana Schimetschek, 2017. "Will They Take the Money and Work? An Empirical Analysis of People's Willingness to Delay Claiming Social Security Benefits for a Lump Sum," *Journal Risk and Insurance*, doi:10.1111/jori.12173.

McFadden, D., 1998. "Measuring Willingness-To-Pay for Transportation Improvements," in T. Gärling, T. Laitila, and K. Westin, eds, Theoretical Foundation of Travel Choice Modeling (Amsterdam: Elsevier Science), 339-64.

Michaud, P.-C. and A. van Soest, 2008. "How Did the Elimination of the U.S. Earnings Test above the Normal Retirement Age Affect Labour Supply Expectations?" *Fiscal Studies* 29(2), pp. 197-231.

Organisation for Economic Co-operation and Development (OECD). 2006. Live Longer, Work Longer, OECD, Paris.

Martin, John P and Edward Whitehouse, 2008. "Reforming Retirement-Income Systems: Lessons from the Recent Experiences of OECD Countries," *IZA Discussion Papers*, No. 3521

Samwick, Andrew A., 2000. "Is Pension Reform Conducive to Higher Saving?" *The Review of Economics and Statistics*, 82(2): 264–272.

Sass, Steven A, Courtney Monk, and Kelly Haverstick, 2010. "Workers Response to the Market Crash: Save More, Work More," Center for Retirement Research Brief, Boston College. Available at: http://crr.bc.edu/briefs/workers_response_to_the_market_crash_save_more_work _more. html

Social Security Administration, 2017. "Annual Statistical Supplement to the Social Security Bulletin, 2016"*SSA Publication No. 13-11700*.

Van Soest, Arthur, Arie Kapteyn and Julie Zissimopoulos, 2007. Using Stated Preferences Data to Analyze Preferences for Full and Partial Retirement. IZA Discussion Paper No. 2785.

Van der Klaauw, Wilbert and Kenneth I. Wolpin, 2008. "Social Security and the Retirement and Savings Behavior of Low-Income Households," *Journal of Econometric*s, 145(1), 21-42.

Zellner, Arnold, 1962. "An efficient method of estimating seemingly unrelated regression equations and tests for aggregation bias," *Journal of the American Statistical Association* 57: 348–368.

Appendix A: Representativeness of the stated choice sample

To find how representative the HRS Internet sample and our stated choice sample are compared to the entire HRS population, we compare their characteristics in Appendix Table 1. The first column shows the characteristics of respondents from the 2006 HRS core who do not currently receive Social Security benefits, the second column restricts the sample to those who are eligible to participate in the HRS Internet survey (Wave 2, Phase II) and do not receive Social Security benefits, and the third column only includes our stated choice sample. It shows that the stated choice sample and the Internet sample are closely comparable. Compared to all HRS respondents, the stated choice sample tends to be slightly more educated and wealthier, but the differences are rather small in magnitude, though statistically significant, under the assumption that the samples are independent. We should still bear them in mind when generalizing our findings to the population since we find larger behavioral responses to the hypothetical scenario among the less wealthy and less educated individuals. Respondents in the stated choice sample are also 9 percentage point more likely to be working in 2006. The stated choice sample is however very comparable to the Internet eligible sample.

   While Internet samples tend to be more educated and wealthier than the general population, which is also true in the case of the entire HRS Internet sample, this is not the case in our analysis. The reason is that we focus on respondents who do not yet receive Social Security, implying that our sample consists mostly of respondents age 65 or younger. At these younger ages, there are no large differences by characteristics between Internet users and non-users.

   Note that the stated choice sample is not completely comparable to the other samples because the stated choice sample retains only respondents who report a positive subjective probability of receiving Social Security in the future, and excludes those who report a zero percent subjective probability. This subjective probability is not elicited in the core HRS (rather, a yes/no format question is asked); thus, we cannot replicate the selection in an identical manner. Some of the differences in characteristics might therefore also be explained by this different selection criterion.

Appendix B: Computation of Social Security Benefit Entitlements

   According to Social Security rules, benefits are calculated as a function of the individuals' top 35 earnings years. A worker's earnings (up to a taxable maximum defined each year) are first indexed using the Average Wage Indexing (AWI) series to the average wage level when she is 60 to reflect the change in wage levels that occurred during her working life. Up to 35 years of earnings are used to compute average indexed monthly earnings (AIME). The Primary Insurance Amount (PIA) is the sum of three

separate percentages of portions of the AIME. The bend points for the formula are year-specific. The PIA is the monthly benefit the worker would receive if she retires at her normal retirement age. If she retires earlier than her normal retirement age, she will receive a reduced monthly benefit. If she retires later than her normal retirement age, she will receive an increased benefit.

We use Social Security earnings records, which are available in the HRS up to the year 2003. For subsequent years until the respondent retires (i.e., claims Social Security), we forecast each respondent's earnings: starting from the last observed earnings, we apply a nominal rate of growth of 5 percent. This growth rate equals the average nominal growth rate observed in the Average Wage Index during the 45 years preceding 2007, the year of our survey. To the resulting earnings histories, we apply Social Security rules:

- Determine taxable maximum in each year.
- Index earnings before the age of sixty to the year the respondent turns 60.
- Choose top 35 years (or 35*4 quarters).
- Compute AIME.

Up to the year 2007, we use the published values of the AWI, of the taxable earnings limit, and of the bend points in the PIA formula for computing the PIA. For subsequent years, we forecast these values applying a nominal growth rate of 5 percent as we did with earnings.

For each respondent, we calculate the AIME and the PIA for each possible claiming age from 62 to 70. (In this context, the AIME may differ depending on the claiming age because an individual who claims later is assumed to have worked longer.) For respondents who are already 62 or older at the time of the survey, we perform the calculation for each age from the current age to age 70. We use the results to compute the annual Social Security benefit associated with each possible claiming age, taking into account any applicable early claiming penalty or delayed claiming credit. We also calculate the present value of the Social Security benefits associated with each claiming age for every respondent using the following formula:

Proceed in two stages to obtain wealth equivalent 2007:

a) Calculate present value for year[j] when R claims at age j

(SS is an indexed annuity, so discount by real rate of return for any period j+t):

$$PVSS[j] = \sum_{t=j}^{110} \left(SSB[j] \cdot P\left(alive\,at\,t \mid alive\,in\,2007\right) \right) \cdot 1.03^{j-t}$$

b) Convert into wealth equivalent discounting from year[j] back to 2007 by nominal rate of return = 5%

$$PVSS[j]07 = PVSS[j] \cdot 1.05^{(2007-year[j])}$$

To construct the survival probabilities, we used SSA life tables for the 1949 cohort of men and women, obtained from the Berkeley Mortality Data Base. 1949 is the mode of birth year in our sample.

Appendix Table 1: Comparison of Sample Characteristics between the Stated Choice Sample, the HRS Core, and the Sample of Those Eligible to Be Interviewed Over the Internet, unweighted

	HRS Core 2006, No Social Security N=5529	Internet eligible, No Social Security N=3355	Stated Choice Sample N=1020	P-Values from the t-test of differences between column 1 and 3*	P-Values from the t-test of differences between column 2 and 3*
Age (2007 internet module)	56.82	56.64	55.94	0.00	0.00
Male	0.39	0.38	0.39	0.70	0.56
Years of education (2006 core)	13.31	14.38	14.44	0.00	0.47
Wealth Quartile (2006 core)	2.43	2.70	2.70	0.00	0.84
Work for pay (2006 core)	0.76	0.82	0.85	0.00	0.01
Work for pay (2007 internet module)	(n/a)	(n/a)	0.83	(n/a)	(n/a)

*P-value under the assumption of independent samples.

Appendix Table 2: Response Patterns for Working Longer and Claiming Social Security Later, in percent (N=1,003)

	Claim Social Security later			
Work longer	YES	MAYBE	NO	Total
YES	15.55	15.15	3.39	34.10
MAYBE	3.69	37.79	8.57	50.05
NO	0.50	6.38	8.97	15.85
Total	19.74	59.32	20.93	100.0

Appendix Table 3: Response Patterns for Reducing Spending, in percent (N=995)

Before Retirement: spend less	After retirement: reduce spending			
	YES	MAYBE	NO	Total
YES	35.28	5.13	0.20	40.60
MAYBE	22.41	24.82	1.91	49.15
NO	2.41	4.52	3.32	10.25
Total	60.10	34.47	5.43	100.0

Appendix Table 4: Scheme for Reducing Dimensionality

			"Work longer" dimension:	
			= 1 if **Definitely YES** to "work longer" or "claim Social Security later." = 0 otherwise.	
			0	1
"Reduce Spending" Dimension	= 1 if **Definitely YES** to "reduce spending before retirement" or "reduce spending after retirement." = 0 otherwise.	0	Definitely yes to none	Only definitely yes to working longer
		1	Only definitely yes to reducing spending	Definitely yes to both

Appendix Table 5: Alternative grouping of responses, combining YES and MAYBE to indicate respondent intentions

Response	N	*Percent*
Do neither	21	*2.1*
Work longer (yes or maybe)	12	*1.2*
Spend less (yes or maybe)	69	*6.9*
Do both (yes or maybe)	902	*89.9*
All	1,004	*100.0*

Appendix Table 6: Bivariate Probit Results for Working Longer and Reduce Spending for Couples

|	Work longer		Reduce spending	
	Coefficient	*P-Value*	Coefficient	*P-Value*
Male	0.120	*0.538*	0.108	*0.578*
Age <54	0.145	*0.483*	-0.182	*0.373*
55-59	(ref)		(ref)	
60 or older	0.008	*0.975*	-0.568	*0.038*
Spouse's age				
> 1 year younger	0.340	*0.100*	-0.029	*0.893*
within one year	(ref)		(ref)	
> 1 year older	0.371	*0.122*	0.168	*0.509*
Not working	-0.800	*0.001*	0.131	*0.574*
high school or less	-0.193	*0.361*	0.377	*0.068*
some college	0.116	*0.539*	-0.027	*0.890*
college or more	(ref)		(ref)	
Social Security Wealth				
Lowest tercile	0.101	*0.661*	0.065	*0.761*
Second tercile	0.284	*0.161*	0.260	*0.213*
Highest tercile	(ref)		(ref)	
Other Wealth				
Lowest tercile	0.344	*0.083*	0.175	*0.380*
Second tercile	0.129	*0.473*	0.159	*0.395*
Highest tercile	(ref)		(ref)	
Own health: fair or poor	-0.363	*0.238*	-0.333	*0.287*
Spouse's health: fair or poor	0.159	*0.610*	-0.400	*0.194*
< 50 %	(ref)		(ref)	
50%	-0.258	*0.221*	0.349	*0.110*
> 50 %	0.097	*0.632*	0.400	*0.059*
Prob of receiving bequest in the next 10 years	0.002	*0.374*	0.003	*0.165*
Number of grandkids	0.000	*0.996*	0.060	*0.121*
Has a parent alive or spouse has a parent alive	-0.009	*0.965*	0.159	*0.460*
Spouse reports reduce spending	0.239	*0.164*	0.066	*0.777*
Spouse reports working longer	0.463	*0.040*	0.209	*0.225*
Constant	-1.222	*0.000*	-0.614	*0.062*

Number of observations = 300. Correlation between random terms ρ = 0.337 which is statistically significantly different from zero (P=0.001). Regression also included an indicator for missing values on Social Security wealth.

Appendix Figure 1: Introduction to the Bins-And-Balls Exercise

For some people it is not easy to predict when they will start collecting their Social Security benefits. In the next question, we ask you to think about the age at which you will start collecting these benefits. We will show you 20 balls that you can put in eight different bins, reflecting what you think are the chances out of 20 that the age at which you will start collecting falls in each bin. The more likely you think it is that the age at which you will start collecting falls in a given bin, the more balls you should assign to this bin. For example, if you put all the balls in the bin 63, it means you are certain that you will start collecting these benefits on or after your 63rd birthday and before your 64th birthday. Another example is illustrated on the next screen.

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Appendix Figure 2: Training Example to Familiarize Respondents with Bins-and-Balls Design
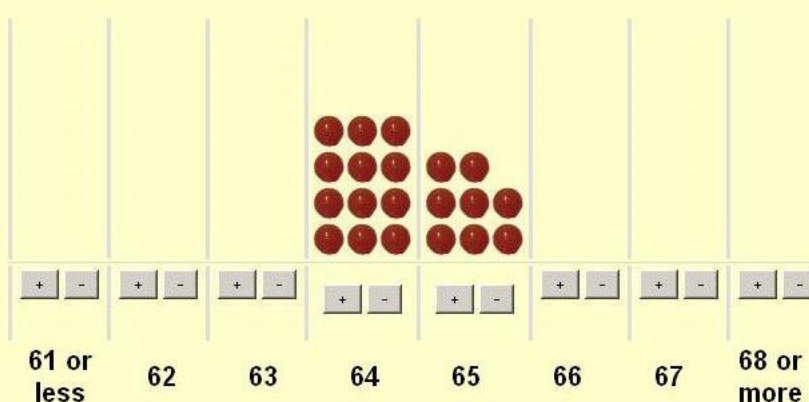
In this example, there are no balls in the ranges below 64 or above 66, so for this person it is certain that benefits will not be collected before turning age 64 and after turning age 66. 12 out of 20 balls are in the bin 64 meaning that the chance that benefits are collected on or after the 64th and before the 65th birthday is 12 out of 20 (60 percent). There is a smaller chance, 8 out of 20 (40 percent), that benefits are collected at age 65. Of course this is just an example to illustrate; the chances you have in mind may be completely different. Now it's your turn! Choose next to start allocating balls.

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