What Motivates Social Security Claiming Age Intentions?
Testing Behaviorally-Informed Interventions Alongside Individual Differences

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The decision of when to claim Social Security Administration (SSA) retirement benefits is a highly individual decision. Retirees must take into account their own family situations, income options (such as part-time work, pensions, or other retirement accounts), and consumption needs (Diamond and Hausman 1984). They must also deal with substantial individual uncertainty around subjective longevity and health status (Khan, Rutledge, and Wu 2014). Beyond these economic issues of when to optimally claim, individual differences in psychological preferences can also affect the claiming decision. For example, recent RRC-funded research has identified that measurable individual differences in loss aversion, intertemporal patience, and perceived ownership of SSA benefits are also highly predictive of claiming intentions (Shu and Payne 2016). While different strands of research have investigated the impact of heterogeneity on the claiming decision, as well as the impact of information display and interventions on claiming intentions (e.g., Brown, Kapteyn, and Mitchell 2016; Knoll 2011; Knoll, Appelt, Johnson, and Westfall 2015; Liebman and Luttmer 2015), there has been little work pulling together both measurement of individual differences and impacts of interventions in the same experiment.

Thus, in the current research, we aimed to test 1) the effectiveness of a variety of different interventions meant to help consumers better reason about Social Security claiming age, 2) the role that individual differences play in claiming age intentions, and 3) interactions between interventions and individual differences on claiming age intentions. By investigating these dimensions of decisions about claiming intentions, we hope to better model the decision and thus generate better predictive models of which retirees will decide to claim earlier or later.

Previous work on SSA claiming age has largely focused on non-psychological factors such as health and socioeconomic status, finding that consumers who are in poor health tend to claim earlier than those who are in better health (Gustman and Steinmeier 2005), and that workers with a higher socioeconomic status tend to work longer and claim later than workers with a lower socioeconomic status (Li, Hurd, and Loughran 2008). But, as Knoll (2011) and Shu and Shu (2018) have observed, there are a variety of psychological factors that may also play a role in the decision of when to claim benefits, some of which have been empirically investigated in intervention-based contexts, some of which have been investigated in measured contexts (i.e., as individual differences), and some that have not been tested. Although there are a wealth of interventions and measured constructs that *could be* investigated in the Social Security claiming

context, the temporal and financial scope of this project mean that a non-comprehensive set of interventions and constructs *can be* examined. As a result, we focused on interventions and constructs for which there was reliable, theory-driven evidence in either Social Security claiming contexts, financial decision-making contexts, or contexts that were conceptually closely related.

In what follows, we first briefly review bodies of research underlying psychologically-informed interventions, and then discuss individual difference factors that may be involved in SSA claiming age decisions.

Psychologically-Informed Interventions

Framing Interventions. The way that retirement age and payout benefits are framed can theoretically affect willingness to claim SSA benefits. In deciding when to claim SSA benefits, workers may evaluate their options in a relative context (Kahneman and Tversky 1979). That is, rather than deciding in an absolute sense whether a given retirement age makes financial sense, workers may compare the *gains* or *losses* that they would receive as a function of some reference point. If, for example, a worker had considered retiring at age 62, then retiring at age 64 could be framed as a 'loss,' in that the worker could have had two more years of time in retirement. But, retiring at age 64 could also be framed as a 'gain,' in that the worker could have a higher monthly payout from delaying their claiming age. In one related study, Fetherstonhaugh and Ross (1999) found that claiming age intentions differed as a function of whether a hypothetical retirement age represented a loss of money over time or a gain (with respondents choosing a later age when a younger age represented a loss of money). More recently, Brown, Kapteyn, and Mitchell (2016) found that respondents prefer a later claiming age when claiming later is framed as a gain.

Other work has examined framing in a different way. Namely, payouts can be framed either as an annuitized stream (paid monthly) or as a lump sum, which totals the monthly payouts over time. Prior work in this domain has investigated whether providing individuals with a table of cumulative payouts at different live-to ages can affect claiming intentions, and finds that such cumulative payout information tends to encourage earlier claiming (Shu and Payne 2016). A different approach may be to sum monthly payments into an annual total. Although this framing has not been examined in the context of SSA claiming decisions, existing research has found that for lower values of wealth, annuities seem less adequate than their equivalent lump sums; when retirement wealth is framed as an annuity, survey respondents report higher saving intentions

(Goda, Manchester, and Sojourner 2013; Goldstein, Hershfield, and Benartzi 2016). Framing Social Security benefits in terms of their monthly payouts has been the standard approach in both formal SSA communications and in prior research projects, but understanding the impact of displaying payout information as annual income rather than monthly may offer new insights into how individuals are evaluating these amounts as input to their decisions.

Normative Messaging. Previous work has indicated that consumers are often influenced by their perceptions of what is normative in a given context. Such messages can come in the form of *descriptive* norms (i.e., messages regarding what sort of behavior other people engage in) as well as *injunctive* norms (i.e., messages regarding what sort of behavior is valued by others in a given context). Although normative messaging has not been tested in the retirement claiming domain, other work has found that normative messages have encouraged hotel guests to participate in an environmental conservation program, and especially so when the normative messages were provincial in nature (i.e., when they referred not only to "other guests" but specifically to other guests who had shared "immediate situational circumstances" such as staying in the same hotel room; Goldstein, Cialdini, and Griskevicius 2008). Furthermore, injunctive messages have motivated consumers to be more mindful of their water usage (Schultz et al. 2007). Thus, in the context of Social Security claiming, norm-based messaging could emphasize what other retirees most often choose (descriptive), what other people recommend (injunctive), or what other people who are situationally similar typically do (people-like-you).

Considerations of Future Selves. A growing body of work has found that the way consumers consider their future selves can affect intertemporal decision-making (Hershfield and Bartels, 2018). Namely, consumers who feel more emotionally connected to their future selves tend to have accumulated more assets over time and also demonstrate lower discount rates in laboratory settings (Ersner-Hershfield et al. 2009). Drawing on these findings, researchers have attempted to make the emotional connection between current and future selves stronger by portraying distant selves in more vivid, emotional terms (Hershfield, John, and Reiff 2018). For example, retirement saving appeals that explicitly drew attention to the responsibility one might have for one's future self led to increased saving among a group of university employees, especially for those who already felt a sense of connection to their future selves (Bryan and Hershfield 2012). Other work has found that showing consumers' age-progressed renderings of their future selves can increase saving intentions (Hershfield et al. 2011).

Information-Based Interventions. People have difficulty forecasting how they will feel in the future about decisions that are made in the present (Wilson and Gilbert 2005). For example, consumers may over-estimate how happy they will be after a positive life event, but also over-estimate how negatively they will feel after a suboptimal event (Gilbert et al. 1998). One way of combatting affective forecasting errors, then, is to provide information that aids consumers in better anticipating their future feelings. Although such interventions have not been tested in the context of SSA claiming decisions, providing information that highlights the emotional reactions that other consumers have had from a) claiming too early and thus later regretting their choice or b) not having sufficient retirement funds, may nonetheless help consumers better understand the emotional consequences of claiming decisions.

Self-Reflective Interventions. Finally, to the extent that consumers tend to be biased toward the present, prior work has aimed to give more weight to the future rather than the present. Research in the tradition of query theory, for example, has found that people tend to consider the immediate benefits of an intertemporal choice before they consider the delayed benefits of an intertemporal choice. In the context of laboratory-based temporal discounting tasks, directing attention first toward the delayed benefits of an intertemporal choice, however, can result in greater patience, including for claiming decisions (Weber et al. 2007; Knoll et al. 2015). In related fashion, recent RRC-funded research has found that when survey respondents indirectly considered the benefits of claiming SSA benefits later in life, they reported later claiming age intentions (Greenberg et al. 2017). Interventions that ask individuals to think more deeply about the tradeoffs between earlier and later claiming, whether through direct queries or other forms of self-reflection, may generate deeper engagement with the decision and lead to changes in claiming intentions.

Individual Differences Relevant to Claiming Age Intentions

As with the interventions reviewed above, there are a host of individual differences that could be affect claiming age intentions. Understanding the effects of heterogeneity on claiming decisions has been an important focus of much of the prior research in this domain (Brown, Kapetyn, and Mitchell 2016; Gustman and Stenmeier 2005; Scott 2012; Shoven and Slavov 2012). However, much of this work has focused on observable demographic or employment characteristics as the primary sources of heterogeneity. In addition to these observable characteristics, we are interested in how individual differences in psychological (i.e., behavioral

or cognitive) factors may influence the decision making process that influences claiming intentions. Again, for both practical and theoretical reasons, we limited our investigation to factors that would seem to be most relevant based on prior work.

Personality. In the realm of saving behavior, prior research has found that self-reported saving was related to emotional stability, introversion, and conscientiousness, three of the Big Five personality traits (Brandstätter and Güth 2000). Additional work has found that conscientiousness is highly correlated with longevity, and that it also positively affects preparation for retirement (Hill et al. 2011, Hurd and Rohwedder 2011).

Financial Literacy and Numeracy. Many consumers are unfamiliar with basic economic concepts surrounding knowledge about credit, saving patterns, mortgages, etc. Lower levels of such financial literacy has been previously linked to lowered preparedness for retirement (e.g., Lusardi and Mitchell 2007). Along similar lines, *numeracy*, or the ability to understand and ultimately transform probability numbers (Peters et al. 2006), has been associated with different future wealth trajectories in retirement (with less numerate consumers showing evidence of poorer retirement trajectories; Banks, o'Dea, and Oldfield 2010).

Risk and Time Factors. Risk aversion is assumed to be a large driver in financial decisions regarding future wealth, including income during retirement (Arrow 1964). Higher levels of risk aversion should lead individuals to claim later, as they attempt to hedge against the downsides of running out of money in later life. We focus in this research on financial risk tolerance (Blais and Weber 2006) rather than a standard economic measure of risk aversion since it may better capture the emotional content of the long run risk concerns inherent in these decisions. In addition to risk tolerance, we are also interested in capturing differences in loss aversion, since loss aversion and risk aversion can yield different predictions for behavior in the context of claiming decisions (Rabin and Thaler 2001; Shu and Payne 2016). Our measure of loss aversion is one previously used in annuity choice research (Shu, Zeithammer, and Payne 2016) and is developed from work by Brooks and Zank (2005). Finally, since individual differences in time discounting can have large effects on how future financial outcomes are valued (Schreiber and Weber 2016), we measure differences in temporal discounting.

Attitudes toward the Future and Future Selves. How connected consumers feel to their future selves has been linked to a variety of important outcomes including health, saving behavior, asset accrual, and the tendency to make ethically sound decisions (Hershfield 2018).

Along similar lines, the tendency to plan for the future has been linked to FICO credit scores, reflecting an individual's creditworthiness (Lynch et al. 2009).

Demographic Factors. Previous work has found that basic demographic factors such as age, sex, education, income, marital status, dependents, and ownership of 401K or pension are either related to actual claiming age or claiming age intentions (Knoll 2011). Overall financial status, as measured through well-validated scales such as the CFPB Financial Well-Being scale, should also be predictive of claiming age intentions.

Attitudes toward Social Security. Prior research has found that perceptions of the solvency of the Social Security Administration can affect the timing of claiming decisions (Gustman and Steinmeier 2015). In addition to solvency concerns, more psychologically-driven individual level attitude measures have also been found to affect claiming intentions. Psychological ownership, or the feeling that an entitlement is "mine," can affect intentions toward social programs (Shu 2018). Prior RRC funded research has found that high measures of perceived, or psychological, ownership toward Social Security contributions and benefits can lead to earlier claiming intentions (Shu and Payne 2016).

Overview of Current Research

In the current research, and as described in more detail below, we examine thirteen interventions (derived from the literature reviewed earlier) alongside individual differences that represent personality, demographic factors, thoughts about the future and future self, financial literacy and numeracy, risk tolerance, and attitudes toward Social Security. This work thus complements and extends work by Brown, Kapteyn, and Mitchell (2016) on how gain/loss framing affects claiming, by Knoll et al. (2015) on how ordering of information queries about benefits of claiming can change claiming preferences, and by Beshears et al. (2014) on how information framing can affect retirement income decisions. Notably, although this prior research has examined various interventions and individual difference measures that may affect SSA claiming age, no work has examined these interventions, individual differences, and their possible interactions in a single, standardized setting with uniform outcome variables.

The Experiment

The experimental design, data collection plan, and analysis plan were all preregistered (http://www.aspredicted.org/blind.php?x=356m32). At the time of this draft, data collection

continues; it will continue until we hit our preregistered stopping rule ($N = 4500$). Because data collection is still in progress, all results are preliminary and subject to change.

Participants

We recruited 3,508 participants from Amazon Mechanical Turk (AMT) to participate in this experiment in exchange for a small payment (median age 47; 63% female). Previous research has found that AMT has demographics that are reasonably similar to the general population in the US (Berinsky, Huber, and Lenz 2012). Perhaps more importantly, a variety of experiments and correlational studies have found similar results using participants recruited from AMT as compared to participants recruited from representative or probability samples (Coppock 2018; Mullinix et al. 2015; Snowberg and Yariv 2018). Given the goals of this research and the large sample size required to ensure informative results, AMT was an appropriate option.

To ensure that our stimuli were relevant for our sample (e.g., not college students, and not already receiving Social Security retirement benefits), participants were prescreened to be between the ages of 40 and 61 via TurkPrime (Litman, Robinson, and Abberbock 2017). Our target sample size of 4500 participants was based on a power analysis to ensure an 85% chance of detecting an effect of a treatment (relative to the control group) of at least 0.25 standard deviations (e.g., with a standard deviation of approximately 3 years, this grants us an 85% chance of finding a significant effect of treatment if the treatment affects the mean claiming age intention by 9 months). Because the control group served as the comparison for all 13 treatment groups, power is enhanced by ensuring extra precision of the estimated mean claiming age intention in the control group. Thus, we structured the data collection to aim to have a sample in the control group twice as large as those in the treatment groups.

Experimental Design

Our experimental design contained one control group and 13 different interventions, for 14 arms total. The 13 interventions can be separated into 5 broad classes of interventions: framing payment information, normative messages, consideration of future selves, informative treatments, and self-reflection treatments.

Control Group. In the control group, participants read about the importance of Social Security, the fact that retirement benefits vary with claiming age, and a table showing monthly benefits for each claiming age from 62 (early retirement) to 70 (delayed retirement) for a typical

retiree. This served as the base on which all treatments were variations, and the comparison for all treatment groups.

Payment Framing. The first class of interventions simply varied the nature of the presentation of Social Security benefits payment schedule. The default (used in the control and other conditions) presented monthly benefits for a typical retiree who started claiming at age 62 through age 70. Interventions in this category kept the informational content the same, but changed how the information was presented.

Annual Framing. In the annual framing condition, instead of seeing a table of monthly retirement benefits, participants saw a table of annual retirement benefits. These are of course precisely equivalent: the annual benefits the monthly benefits multiplied by 12.

Gains Framing. In the gains framing condition, in addition to seeing a table of monthly retirement benefits, participants also saw the difference between the monthly benefits earned by claiming at a given age and the monthly benefits earned by claiming at the earliest possible age (62). This frame highlights the gains that can be had from delaying claiming.

Losses Framing. In the losses framing, in addition to seeing a table of monthly retirement benefits, participants also saw the difference between the monthly benefits earned by claiming at a given age and the monthly benefits earned by claiming at the latest possible age (70). This frame highlights the losses that are incurred from early claiming.

Normative Messaging. The second class of interventions included a brief message about norms regarding claiming Social Security retirement benefits. Descriptive norms refer to how people do behave. Injunctive norms refer to how people ought to behave. In each case, after reading a brief message, participants reported back what they had learned to ensure they engaged with the material.

Descriptive Norm. Participants in the descriptive norm group were given information that most people chose to delay receiving Social Security benefits (that is, not claim as soon as possible). Specifically, they were informed that "Delaying claiming age is becoming increasingly common. About 6 out of 10 adults currently choose to delay claiming Social Security benefits."

Injunctive Norm. Participants in the injunctive norm group were given information about what people "ought" to do regarding claiming Social Security benefits. "Delaying your claiming age is a good idea for your financial well-being. Delaying claiming Social Security benefits is a wise choice."

People-Like-You Message. Participants in the people-like-you group were given similar information to the overall descriptive norm, but it was matched to the participant's gender to potentially heighten its relevance for the participant. "Delaying claiming age is becoming increasingly common among [men / women] like you. About 6 out of 10 [men / women] choose to delay claiming Social Security benefits."

Consideration of Future Selves. The third class of interventions included a prompt for participants to vividly picture themselves in the future, as previous research has found that picturing one's future self enables a connection between one's present and future self, reducing present-biased behavior. We tested three variations of this intervention.

Future Self Focus. In the future self focus intervention, we prompted participants to picture their future self and describe what they pictured. "Please vividly picture your future self in retirement (think about your future self's major likes and dislikes, needs, wants, desires, beliefs, values, ambitions, life goals, etc.). Use the space below to briefly describe what you pictured:"

Benefits to Future Self Focus. In the benefits to the future self intervention, participants read the same information as above, with one additional sentence: "By delaying claiming to age 70, your future self will have $931 more per month to satisfy [his / her] needs, wants, and desires." Thus, this condition explicitly made the connection between the future self and how the claiming age decision will affect that future self.

Future Family Benefits Focus. In the future family benefits focus condition, participants imagined their family, rather than just themselves, in the future, and considered the impact of the claiming age decision on future benefits as in the benefits to future self condition.

Information-Based Interventions. The fourth class of interventions provided participants with contextual information about their needs or those of others in retirement.

Insufficiency of Retirement Funds. In this treatment, participants were explicitly informed about their likely income needs during retirement. "On average, many financial planners report that clients need approximately 70%-80% of their pre-retirement income to retire and maintain the same lifestyle." Afterwards, participants were asked to report what they learned to ensure they engaged with the message.

Commonality of Regret. In this treatment, participants were informed about the regret that current retirees feel about having claimed too early. Rather than informing them about their

needs directly, they were informed about others' assessments of the impact of their claiming decisions. "According to a survey by the Nationwide Financial Retirement Institute, about 4 out of 10 retirees say they wish they would have waited to collect Social Security benefits." (Nationwide 2014). Afterwards, participants were asked to report what they learned to ensure they engaged with the message.

Self-Reflective Interventions. Rather than directly providing participants with additional information, the fifth and final class of interventions primarily asked participants to reflect on their own thoughts.

Query Theory. The first such self-reflection intervention relies on query theory, which supposes that the order of decisions aspects considered affects the final decision. Rather than providing a balanced test of first considering reasons to claim benefits later, and then consider reasons to claim benefits earlier, we simply encouraged participants to list reasons why it would be good to receive benefits later or bad to receive benefits early. Participants reported one thought at a time, generating their own reasons for claiming earlier versus later.

Right-Tail Longevity. The second self-reflection considered the impact of considering the downside risk of "living too long". These participants were encouraged to consider at what age they would recommend someone who was going to live to an old age should claim benefits, and then to consider someone they knew personally who lived to an old age in retirement. This intervention was adapted from Greenberg et al. (2017), and was designed to emphasize the later years of retirement, when the larger benefits gained from claiming later would dominate the additional years of benefits foregone by not claiming earlier.

Individual Differences and Potential Moderator Measures

After indicating claiming age intentions, all participants responded to a set of individual difference measures related to claiming age intentions or which may plausibly moderate the effects of the experimental treatments.

In the first block, participants completed a three-item financial literacy quiz (Lusardi and Mitchell 2011), a five-item measure of numeracy (Weller et al. 2013), a ten-item measure of the Big Five personality factors (openness, conscientiousness, extraversion, agreeableness, and stability; Gosling, Rentfrow, and Swann 2003), a four-item measure of financial risk tolerance (Blais and Weber 2006), and a set of nine binary choices between a sum of money today and a

sum of money one year from now to assess intertemporal discounting preferences (e.g., Harrison, Lau, and Williams 2002).

Participants then answered a brief set of demographic questions (including current retirement savings, education, income, marital status, dependents, and ownership of 401(k) or pension; participants reported their sex at the beginning of the survey and age was assessed via the TurkPrime prescreen procedure) before a second block of individual difference items.

This second block of individual difference items included subjective health status, a six-item measure assessing propensity to plan for the use of money over the next year (Lynch et al. 2009), an attention reminder, ten binary choices between risky gambles to assess loss aversion (Shu, Zeithammer, and Payne 2016), a one-item measure assessing future self-connectedness (Ersner-Hershfield et al. 2009), a six-item measure assessing susceptibility to interpersonal influence (Bearden, Netemeyer, and Teel 1989), subjective probabilities of living to 65, 80, and 95 which were used to calculate life expectancy (Payne et al. 2013), and the short five-item version of the CFPB Financial Well-Being Scale.

Finally, we assessed participants' attitudes toward Social Security by asking them to self-assess the extent to which they expect to rely on Social Security benefits, their subjective knowledge about Social Security (adapted from Hadar, Sood, and Fox 2013), the extent to which they expect benefits to be available when they retire (i.e., SSA solvency), and their perceived ownership over their Social Security benefits (Peck and Shu 2018; Shu and Payne 2016).

Method

Participants first read basic information about Social Security retirement benefits and were given a monthly benefits table for a typical retiree. These instructions emphasized that claiming age has a permanent effect on the amount of money retirees will receive for the rest of their life, and noted that full retirement age typically means 66, but it is possible to claim as early as 62 or as late as 70.

After the intervention, if any, participants imagined themselves having just turned age 60 and reported their intended claiming age (again with access to the monthly benefits table). This measure included a "I don't know" option. If participants reported "I don't know," they were then asked to report their intended claiming age if they had to decide; we use this measure for the few participants (<4%) who reported "I don't know." Participants then completed the set of individual difference measures. Median survey duration was 15 minutes.

Analysis Plan

Our preregistered analysis plan proceeded in the four stages described below.

1. First, we analyzed intended claiming age as a linear function of 13 indicator variables, one for each treatment arm. This allowed us to assess the causal effect of each treatment on claiming age against the control condition.

2. Second, we repeated that same analysis while including gender, age, and income as controls.

3. Third, to the second specification we added one individual difference measure at a time to consider their individual relations to claiming age intentions above and beyond the treatments, gender, age, and income.

4. Fourth, to the second specification we added one of 23 theoretically relevant preregistered interactions, along with the component individual difference measure.

Throughout, we also note several additional revealing exploratory analyses that we discovered upon observing the data.

Results

The first finding to note is that participants intended to claim later (median = 68; mean = 67.1; sd = 2.8) than the current distribution of true claiming ages would suggest. As with most such experiments, the *differences* between conditions are likely more informative than the *levels*.

Full results for the preregistered analyses are given in Tables 1-3. Figure 1 includes estimates and 95% confidence intervals for raw condition means. Collectively, the treatments had an effect on claiming age intentions, given a significant omnibus test ($F(13, 3494) = 2.092$, $p = .012$). Figure 2 includes estimates and 95% confidence intervals for condition means controlling for gender, age, and income. Again, the treatments had an effect on claiming age intentions above and beyond the controls, given a significant model comparison test against the controls-only model ($F(13, 3403) = 2.217$, $p = .007$). The text below refers to the estimates including controls, but we note the estimates and pattern of results are extremely similar.
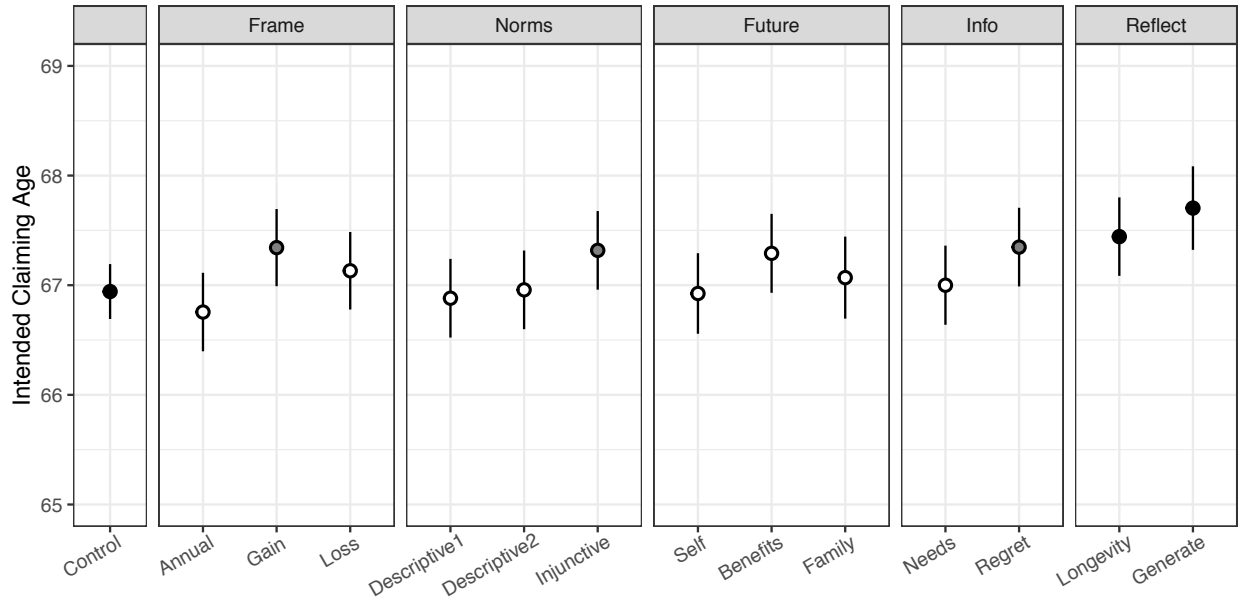
Figure 1. Raw condition means. Error bars represent 95% confidence intervals of the condition means. Filled circles represent significant comparisons relative to the control condition (also filled); black represents *p* < .05; gray represents *p* < .1.
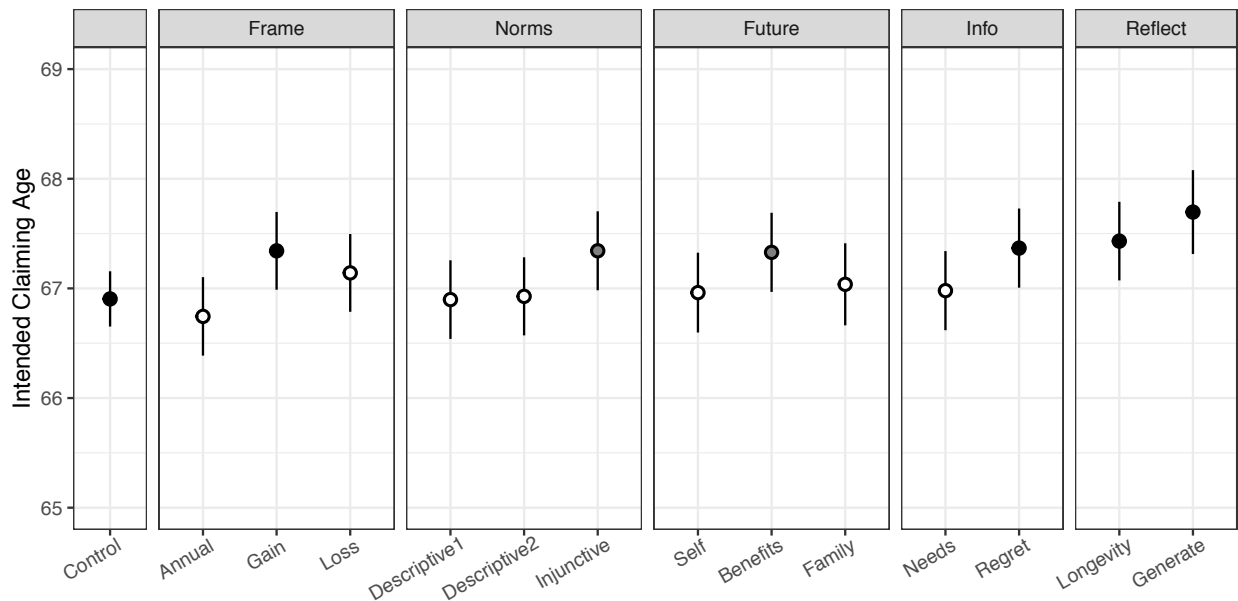

Figure 2. Condition means, adjusted for gender, age, and income. Error bars represent 95% confidence intervals of the condition means. Filled circles represent significant comparisons relative to the control condition (also filled); black represents *p* < .05; gray represents *p* < .1.

The self-reflection treatments exhibited the largest effects relative to control: the query theory intervention generated a 10-month delay in average claiming age intentions and the longevity intervention generated a 6-month delay in average claiming age intentions. Generating

one's own reasons to delay, or explicitly considering the consequences of claiming too early, lead to later reported claiming intentions.

Four other treatments had significant or marginally significant effects compared to the control group. The gain frame and the commonality of regret conditions each led to significantly more delayed claiming age intentions (5-to-6-months), and the injunctive norm and future benefits conditions each led to marginally more delayed claiming age intentions (5-months).

Because of the non-normal distribution of claiming age intentions, we also examined exploratory analyses regarding the distributions of claiming ages. Proportion intending to claim at age 66 showed a decrease in query theory condition (presumably as they are choosing to claim later, at age 70), and a statistically and substantively significant increase in the annual frame condition (from 14% in the control group to 27% in the annual frame condition; other conditions ranged from 7% to 16%). Age 66 is the earliest one could claim given the sample benefits table and receive more than $20,000 a year in benefits, possibly reflecting a prominent target value in the annual frame that led participants to intend to claim *earlier* than they would have otherwise. Such target or goal values may have had an ironic effect in the annual frame.

Individual Differences. As given in Table 2 and shown in three panels of Figure 3 below, several of the measured individual differences were significantly linked to claiming age intention, controlling for age, income, and sex. The top panel represents attitudes and beliefs directly related to Social Security. The better an individual's subjective health, the longer their life expectancy, and the more they expect to rely on Social Security, the later they intend to claim. In contrast, the more they expect Social Security to be solvent when they claim, the more they claim to know about Social Security, and the more they feel a sense of ownership over it, the more likely they are to intend to claim earlier.

The second panel shows the "Big Five" personality characteristics: five factors that help to explain considerable variance in individual predispositions across people. Agreeableness, Openness to Experience, and Emotional Stability are each related to delayed claiming intentions. Neither conscientiousness nor extraversion are related to claiming intentions.
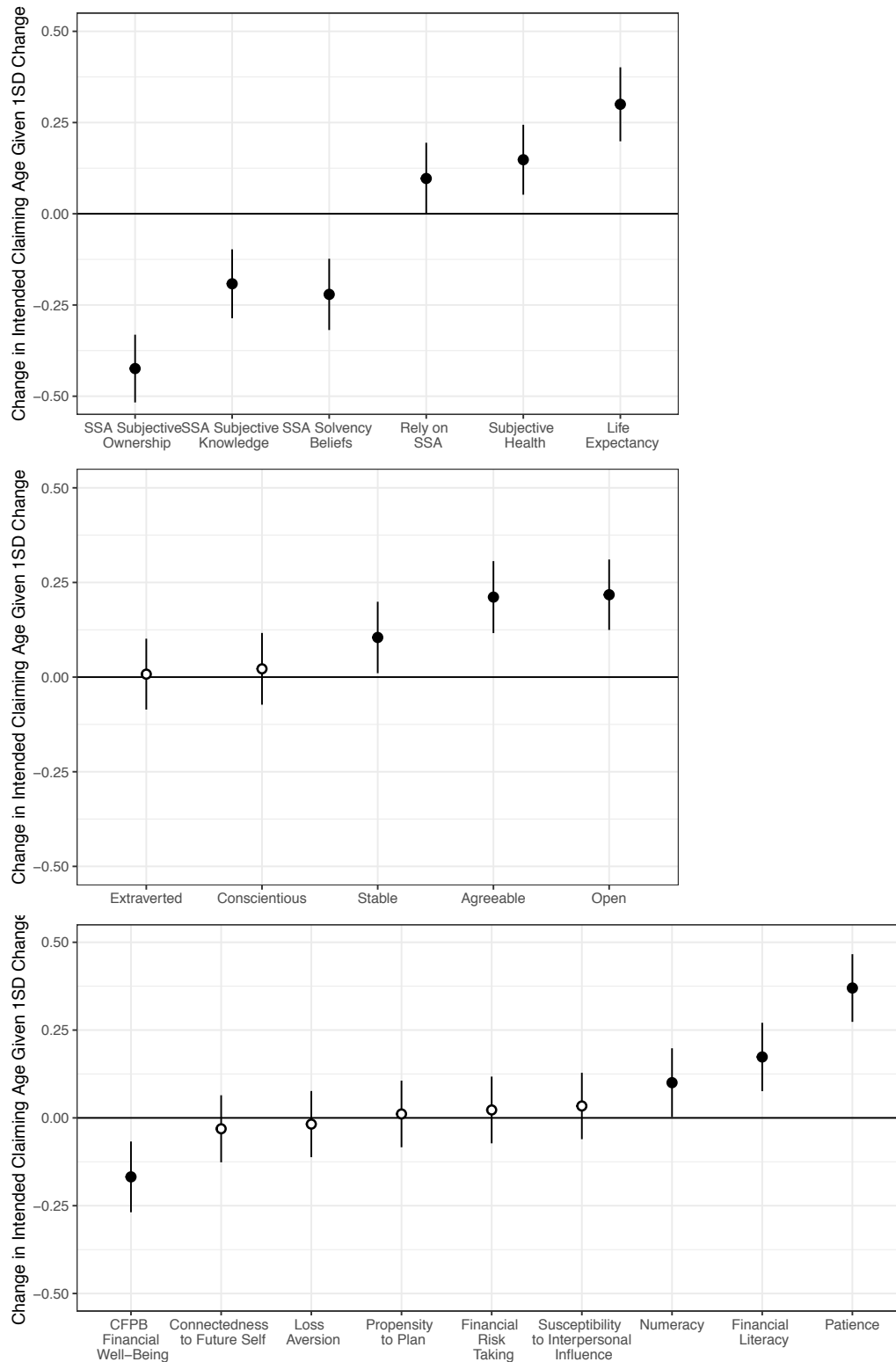
Figure 3. Coefficients on individual difference, attitudinal, and belief moderators. Error bars represent 95% confidence intervals. Coefficients represent expected change in intended claiming age (in years) based on a 1 standard deviation change in the underlying moderator.

The third panel assesses a variety of measures regarding an individual's financial status and abilities. The greater their self-reported financial well-being, the earlier they intend to claim. The greater their financial literacy, numeracy, and especially patience, the later they intend to claim. Neither future-self connectedness, financial risk taking, interpersonal influence, loss aversion, nor propensity to plan were associated with claiming age intentions.

Interactions. Of the 23 theoretically-motivated interactions we preregistered that we would test (out of 20 * 13 = 260 possible interactions), two emerged as statistically significant and one as marginally significant, as shown in Table 3.

First, there was an interaction between the *focus on benefits to future-self* intervention, in which participants were asked to think vividly about their future self and consider the financial gains from delayed claiming, and intertemporal discount factor, such that there was a greater effect of the future benefits intervention on intended claiming age among low-patience individuals compared to high-patience individuals. This is depicted in Figure 4.
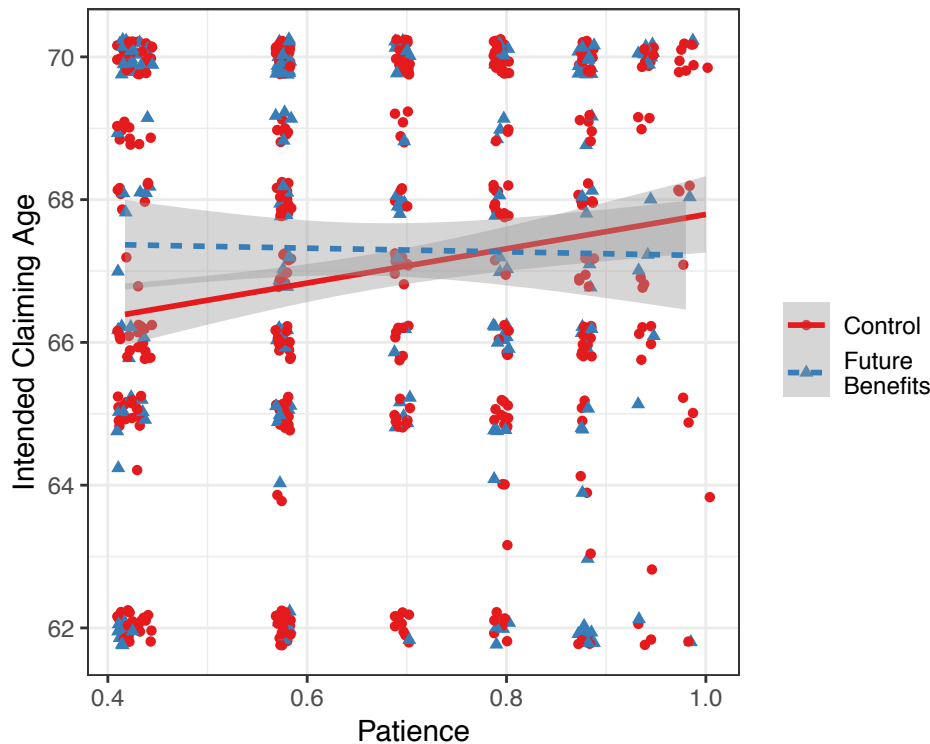

Figure 4. Interaction between patience and benefits to the future self condition on intended claiming age.

Second, there was an interaction between the *information about commonality of regret* intervention, in which participants were asked to consider the fact that 4 of 10 retirees regret not delaying claiming, and loss aversion, such that there was a greater effect of the commonality of regret intervention among participants who were low in loss aversion. This is depicted in Figure 5.
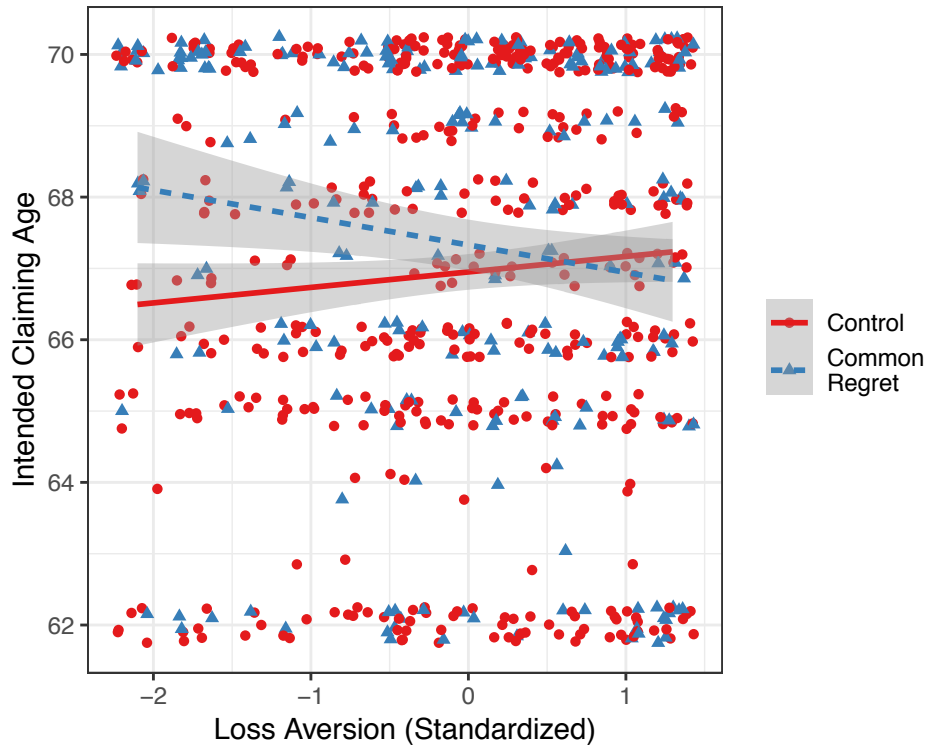

Figure 5. Interaction between loss aversion and information about others' regret over claiming too early.

Finally, there was a marginally significant interaction between focus on benefits to one's future family and propensity to plan such that the relationship between propensity to plan and intended claiming age was positive when focused on one's future family and not statistically different from zero in the control condition.

Discussion and Conclusion

Little work has compared a set of interventions designed to affect SSA claiming age intentions, or how such interventions vary according to plausibly relevant individual differences. The findings presented here represent initial investigation of these topics; as data collection is ongoing, more definitive results may yet emerge. We also intend to follow up this initial

exploratory study with a more direct investigation of the significant results found here, with the intention of both replicating these early results and further exploring the causal mechanisms they may represent.

Taken together, the current findings indicate that although claiming intentions are relatively difficult to influence, several interventions including gains frames, considering future regret, right-tail longevity concerns, and generating reasons why one might want to delay each have the potential to delay claiming age intentions, and consideration of future benefits and others' regret may exhibit heterogeneity across different types of people. Though this work relies on claiming age intentions in a convenience sample, they are suggestive of drivers of individuals claiming age, of how claiming age may differ across people and situations, and sets the groundwork for future research to examine heterogeneity in effects and personal characteristics.

Research on the psychology of decumulation has suggested that options for improving retirement decision making around decumulation should include financial literacy training, defaults, disclosures, framing, and/or customized interventions (Shu and Shu 2018). The interventions tested here fall into several of these categories and offer some initial insight on which approaches may be the most effective. Future potential projects could build on the types of interventions tested in our project to explore how active matching of individuals according to their profiles may lead to more effective customized information displays. As an example, online claiming calculators and tools could be modified to begin with the collection of key individual factors such that individuals would then be directed to a tool most helpful to their own situation. We are hopeful that this ongoing research will provide us with insights that can guide our understanding of how individuals make these important decisions.

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Table 1. Treatment effects on intended claiming age.

	Intended Claiming Age			
	(1)		(2)	
	b	se	b	se
Frame - Annual	-0.187	0.223	-0.159	0.223
Frame - Gains	0.401*	0.220	0.438**	0.222
Frame - Losses	0.190	0.221	0.237	0.222
Norms - Descriptive	-0.061	0.223	-0.006	0.224
Norms - Injunctive	0.376*	0.223	0.439*	0.224
Norms - People Like You	-0.015	0.223	-0.023	0.222
Future Self - Self Benefits	0.348	0.224	0.425*	0.224
Future Self – Family Benefits	0.127	0.230	0.133	0.230
Future Self - Self	-0.018	0.227	0.057	0.226
Information - Needs	0.058	0.224	0.075	0.224
Information - Regret	0.405*	0.223	0.463**	0.224
Reflect - Query Theory	0.761***	0.233	0.792***	0.234
Reflect - Right Tail	0.501**	0.223	0.527**	0.223
Female			0.412***	0.099
Income ('000s)			0.006***	0.001
Age			-0.048***	0.008
Constant	66.942***	0.128	66.904***	0.137
N	3,508		3,420	
R^2	0.008		0.032	
F Statistic	2.092**	df = 13; 3494	7.103***	df = 16; 3403

Note: ***$p < .01$. **$p<.05$. *$p<.1$. Constant in Model 1 represents mean intended claiming age in the control condition. In Model 2, controls (gender, income, age) were mean-centered so that the constant in Model 2 represents estimated mean intended claiming age in the control condition.

Table 2. Individual differences predicting intended claiming age.

Moderator	Coefficient	SE
CFPB Financial Well-Being Scale	-0.168***	0.051
Financial Literacy	0.173***	0.050
Financial Risk Taking	0.023	0.048
Future Self Connectedness	-0.031	0.049
Interpersonal Influence	0.034	0.048
Discount Factor (Patience)	0.370***	0.049
Life Expectation	0.300***	0.052
Loss Aversion	-0.018	0.048
Numeracy	0.100**	0.050
Big 5 - Agreeableness	0.211***	0.049
Big 5 - Conscientiousness	0.022	0.048
Big 5 - Extraversion	0.008	0.048
Big 5 – Openness to Experience	0.218***	0.047
Big 5 - Stability	0.105**	0.048
Propensity to Plan	0.011	0.048
SSA Subjective Knowledge	-0.192***	0.048
SSA Perceived Ownership	-0.424***	0.047
Expected Reliance on SSA	0.097*	0.050
SSA Solvency Beliefs	-0.221***	0.050
Subjective Health	0.148***	0.049

Note: ***$p < .01$. **$p<.05$. *$p<.1$. These variables are entered individually in separate models, not together. In each model, gender, income, and age are included as controls, as are the 13 indicator variables for condition. Each variable was standardized prior to inclusion in the model, such that the coefficient represents the expected change in claiming age (in years) given a one standard deviation increase in the individual difference.

Table 3. Preregistered treatment x individual differences interactions predicting intended claiming age.

Moderator	Coefficient	SE
Annual x Financial Literacy	0.087	0.202
Annual x Numeracy	0.082	0.199
Gains x Financial Risk Taking	0.022	0.197
Losses x Financial Risk Taking	-0.016	0.193
Losses x Loss Aversion	-0.169	0.184
Descriptive Norm x Interpersonal	0.160	0.185
Injunctive Norm x Interpersonal	-0.157	0.198
People-Like-You Norm x Interpersonal	-0.124	0.175
Future Self x Patience	-0.167	0.190
Future Self x Propensity to Plan	0.072	0.193
Future Self x Future Self Connectedness	-0.171	0.193
Future Self x Subjective Health	-0.023	0.200
Future Benefits x Patience	-0.492**	0.194
Future Benefits x Propensity to Plan	0.130	0.201
Future Benefits x Future Self Connectedness	0.014	0.194
Future Family x Patience	0.174	0.202
Future Family x Propensity to Plan	0.330*	0.192
Future Family x Future Self Connectedness	0.202	0.194
Information: Needs x Financial Literacy	0.316	0.197
Information: Needs x CFPB Financial Wellness	-0.051	0.193
Information: Regret x Loss Aversion	-0.418**	0.182
Longevity x Subjective Health	0.007	0.195
Longevity x Life Expectation	-0.177	0.198

Note: ***$p < .01$. **$p<.05$. *$p<.1$. These variables are entered individually in separate models, not together. Each model includes the component individual difference (e.g., the model assessing the interaction of Annual Frame x Financial Literacy also includes a main effect of Financial Literacy). In each model, gender, income, and age are included as controls, as are the 13 indicator variables for condition. Each variable was standardized prior to inclusion in the model, such that the coefficient represents the expected change in the effect of the treatment on claiming age (in years) given a one standard deviation increase in the individual difference.