

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

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Abstract

Choosing when to claim Social Security Administration (SSA) benefits is an important decision for older Americans' financial health. While previous work has examined heterogeneity in claiming decisions, relatively little research has systematically tested the psychological factors that predict early or delayed SSA claiming or the effectiveness of theory-driven interventions meant to help with the claiming decision. A preregistered experiment and three replications examined the extent to which intended claiming age is a function of theory-driven interventions, individual difference measures, and relevant interactions between interventions and individual differences. The interventions that increased intended claiming age were those that suggest that delayed claiming may be the right choice (i.e., injunctive norm, information about the commonality of regret), those that highlight the financial benefits from delayed claiming (i.e., gains framing, focus on benefits to the future self), and those that guide preference construction through self-reflection (i.e., focus on right-tail longevity, reason generation). In addition, intertemporal discounting, subjective life expectancy, and perceived ownership of SSA benefits predicted intended claiming age. This research advances our understanding of which retirees will decide to claim earlier or later and offers practical insights for policy makers, financial planners, and consumer finance organizations.

Keywords

consumer financial decision making, Social Security, retirement, experimental methods, behavioral interventions

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The decision of when to claim Social Security Administration (SSA) retirement benefits represents one of the most consequential choices made by older Americans. Given that about one-third of workers in private industry have no pension coverage and only two-thirds of workers save for retirement, SSA benefits represent a substantial source of retirement income among the elderly (SSA 2022a). In addition to being highly consequential, the choice of when to claim (between ages 62 and 70) is also complex. Retirees must take into account their own family situations, income options (e.g., part-time work, pensions, retirement accounts), and consumption needs. They must also deal with substantial individual uncertainty around 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, measurable individual differences in loss aversion, intertemporal discount factors, and perceived ownership of SSA benefits are highly predictive

of claiming intentions (Shu and Payne 2016). While different strands of research have investigated the impact of framing (Brown, Kapteyn, and Mitchell 2016), information (Liebman and Luttmer 2015), individual and psychological differences (Knoll 2011), and query theory (Knoll et al. 2015) on the claiming decision, little work has combined both measurement of individual differences and impacts of interventions in the same experiment.

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Table 1. Summary of Relevant SSA Claiming Literature.

| Study | Sample Description | Sample Size | Key Independent Variable(s) | Relevant Dependent Variable(s) | Main Finding(s) |
|-------------------------------------|---|-----------------|--|--|---|
| Fetherstonhaugh and Ross (1999) | Two surveys at SFO airport; males over age 40 | 176 | Losses versus gains framing; | Hypothetical choice of retiring at age 68 (vs. 65) | Losses framing led to delayed claiming compared with gains framing |
| Gustman and Steinmeier (2005) | HRS (1992–2000); married men who worked full-time | ~7,000 | Time preference | Retirement age | Spikes in retirement at age 62 predicted by high discount rates |
| Li, Hurd, and Loughran (2008) | HRS (1992–2006) | 7,339 | Demographic and socioeconomic variables | Actual SSA claiming age | Those who claim at age 62 have lower earnings, less education, and worse health than those who delay |
| Khan, Rutledge, and Wu (2014) | HRS (1992–2010); ages 51–61 in the labor force | 9,329 or 11,800 | Subjective life expectancy | Expected retirement age, actual retirement age | Greater subjective longevity associated with later expected retirement; changes in subjective longevity associated with changes in expected retirement |
| Knoll et al. (2015) | Three surveys | 2,495 | Gains framing, losses framing, and query theory interventions | Preferred SSA claiming age | Spikes in preferred claiming at age 62; the query theory intervention increased preferred claiming age; visual gains and losses interventions had no effect |
| Liebman and Luttmer (2015) | Survey of workers ages 60–65 | 2,483 | Simple information intervention | Whether respondent received SSA benefits | The simple information intervention did not affect whether people had claimed in follow-up survey |
| Brown, Kapteyn, and Mitchell (2016) | RAND American Life Panel | 1,437 | Ten interventions related to gains and losses framing, and break-even analysis | Expected SSA claiming age | Gains framing and information that anchors at older rather than younger ages increase expected claiming age; “break-even analysis” reduces expected claiming age |
| Shu and Payne (2016) | Three surveys (1: ages 35–65; 2: ages 30–60; 3: ages 40–65) run via SSI and Qualtrics | 3,377 | Subjective life expectancy, loss aversion preference, perceived ownership, information presentation, and framing | Expected SSA claiming age | Greater subjective longevity, lower loss aversion, and lower perceived ownership of SSA benefits predict delayed claiming; effects of information presentation and framing interventions mixed |
| Greenberg et al. (2017) | Two surveys (ages 40–61) run via Qualtrics | 1,826 | Salience of different longevity thresholds manipulation, focus on right-tail versus left-tail longevity intervention | Intended claiming age | Making different longevity thresholds salient does not affect claiming age intentions; focusing on left-tail longevity lowers intended claiming age intention and focusing on right-tail longevity increases claiming age intention |

To study this substantive problem, we aimed to test (1) the effectiveness of several different interventions meant to help consumers better reason about SSA 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. This work contributes to a growing literature on SSA claiming and retirement decisions. Previous work on claiming decisions has largely focused on nonpsychological factors such as health

and socioeconomic status, finding, for example, 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). However, there are a variety of psychological factors that may also play a role in the decision of when to claim benefits (Knoll 2011; Shu and Shu 2018), some of which have been empirically investigated in intervention-based contexts (Knoll et al. 2015; Liebman and Luttmer 2015), some of which have been measured (i.e., as individual differences), and many that have not been

tested. Table 1 provides a brief summary of the relevant literature. Although there are a wealth of interventions and measured constructs that *could be* investigated in the SSA claiming context, we focus here on interventions and constructs for which there is reliable, theory-driven evidence in SSA claiming contexts, financial decision-making contexts, or contexts that are conceptually closely related.

The current research also follows a road map for testing the effectiveness of multiple behavioral interventions as well as psychosocial predictors in a single paradigm, consistent with trends in behavioral science. Recent work in economics and behavioral science has highlighted the importance of conducting studies with many treatment arms in a single setting (Bertrand et al. 2010; DellaVigna and Pope 2018; Milkman et al. 2021; Mrkva et al. 2021; Robitaille et al. 2021), which allows researchers to determine the relative strength of behavioral effects. While this work focuses on SSA claiming, such a protocol is ideal for the study of complex consumer decisions. Although beneficial at any stage for shaping policy, the protocol is especially well-suited for domains in which researchers do not have strong priors, and it can guide inquiry in a more well-defined direction without initial investment in possibly fruitless theory building.

Next, we briefly review bodies of research underlying claiming age intentions, the psychologically informed interventions we test in this project, and the individual difference factors that may be involved in SSA claiming age decisions.

Claiming Age Intentions

Workers who have contributed may begin receiving SSA retirement (Old-Age and Survivors Insurance program) benefits as early as age 62 and as late as age 70. While claiming may coincide with retirement, it need not, and many factors—both economic and psychological—could reasonably affect one’s claiming choice. The longer an individual delays the claiming decision, the larger the monthly benefit the individual will receive for the remainder of one’s lifetime. While the magnitude of financial benefits from delay is designed to be actuarially fair for the average individual, research suggests that delaying is actuarially advantageous for many people, especially married couples and single women (Shoven and Slavov 2014). These benefits are even larger when real interest rates are low (e.g., below 3.5%) because the return from delaying is higher than risk-free rates for investing claimed benefits. Recent research estimates that virtually all Americans between ages 45 and 62 should claim after age 65, and that 90% should wait until age 70 (Altig, Kotlikoff, and Ye 2022). Despite these financial benefits to delaying, actual retiree claiming does not seem to sufficiently react to those actuarial benefits (Shoven and Slavov 2014).

In our studies, we use intended claiming age as our focal outcome measure. Notably, almost all prior research that examines interventions for delayed claiming similarly relies on hypothetical rather than actual claiming age (e.g., Brown, Kapteyn,

and Mitchell 2016; Knoll et al. 2015; Liebman and Luttmer 2015).¹ The measure used in our studies is similar to that used in previous research, as well as that which appears in the RAND American Life Panel. While it is not possible to conclude that findings based on a hypothetical measure would necessarily extend to actual claiming choices, data from the Health and Retirement Study (HRS) suggest that intended claiming age is a strong predictor of actual claiming. Specifically, we computed the correlation between whether an individual was receiving benefits in a given wave of the HRS with whether the individual expected to receive benefits at that time (in an earlier wave of the study). Between the 2000 and 2018 waves of the HRS, linear probability models predicting actual claiming in a given wave from a dichotomous indicator of whether the respondent expected to be a claimant in that wave yielded coefficients ranging from .41 to over .59, depending on the wave. These findings are in line with previous work that demonstrates that claiming age intentions are strong predictors of actual claiming (Brown, Kapteyn, and Mitchell 2016). Because of its predictive validity, prior research has thus relied on intended or expected claiming age, and we follow in that tradition.

Although intended claiming age is strongly correlated with actual claiming age, it is worth noting that intended claiming age is, on average, older than actual claiming age. For example, the average claiming age intention Brown, Kapteyn, and Mitchell (2016) found in their control condition with data collected in 2010 was 65 years and 4 months, whereas administrative data indicates that the average claiming age in 2010 was 63 years and 6 months, and the average claiming age in 2019 was 64 years and 8 months.² Moreover, intended claiming age is higher among younger respondents. Using the HRS data, we ran linear probability models for each biennial wave between 1994 and 2018 predicting intended claiming age from the respondent’s current age. Current age was a significant negative predictor of intended claiming age in 9 of the 13 waves (and nonsignificant in the remaining 4). We find the same pattern across our studies. Given that younger people might consider their intended claiming age as a proxy for their retirement age, these findings are consistent with prior work that demonstrates that people decrease their planned age as they near retirement age (Merkle, Schreiber, and Weber 2022). Thus, our results are best interpreted in terms of differences between treatments

¹ Like the present research, research by Brown, Kapteyn, and Mitchell (2016) was funded by the SSA. Regarding the prospects of a randomized field experiment to examine effects on actual claiming age, they note that the SSA “determined that the financial, operational, and political risks of such an experiment were too great” (p. 147).

² Calculations are based on Annual Statistical Supplements from the SSA (2011, 2020), excluding disability conversions. As Chen and Munnell (2021) point out, given shifts in the population and decisions over time, this analysis overstates claiming early. In 2019, about 33% of claimants were 62 years old, but only about 25% of those eligible at age 62 actually claimed. So although intended claiming ages tend to be higher than realized claiming ages, the difference is less pronounced than it first appears.

and correlations with individual differences, not in terms of absolute levels of claiming age.

Road Map for Testing Interventions Alongside Individual Differences

We set out to determine not only the effects of psychologically motivated interventions on SSA claiming age but also whether relevant individual differences predicted claiming age or moderated the effects of interventions. Given that the existing research on the psychology of SSA claiming is limited and that there are many plausible paths to take, we gave the design of the first study a great deal of attention. We followed an iterative process for selecting which interventions and individual differences to test. At first, we considered a very large set of psychological processes that could underlie the claiming decision. The interventions were built from prior research and were designed to be sufficiently short, understandable, and inexpensive such that consumer advocacy groups (e.g., Consumer Financial Protection Bureau [CFPB]) or the SSA could easily add them to existing online tools. Due to constraints inherent in survey design (e.g., survey length, cost, participant fatigue), we narrowed down the list of potential interventions and individual differences to balance a breadth of potential determinants of claiming with these logistical constraints. The final list was balanced on several criteria, including ease of implementation, support for the construct in previous literature, breadth, and the avoidance of redundancy.

Although the included interventions and individual differences are motivated by theory, we followed an inductive approach (Janiszewski and Van Osselaer 2021) in our first study to determine which, if any, were relevant for claiming age intentions. After conducting the first study, we sought to replicate its significant effects. In any study with many predictors, there is a risk that some significant effects are spurious. In light of this issue and recent evidence that nudges sometimes do not scale up in the field due to publication bias and low statistical power (DellaVigna and Linos 2022), we ran three additional studies in which we included a subset of the interventions and individual differences to replicate those findings from the first study. In all studies, we identified a relevant age group (Studies 1–3: ages 40–61; Study 4: ages 50–61) that would provide the most external validity for any effects we should find.

Psychologically Informed Interventions

The use of behaviorally informed interventions to nudge individuals toward more optimal decisions has been widely tested in a variety of financial (Madrian et al. 2017), health (Loewenstein, Asch, and Volpp 2013), and environmental (Allcott and Mullainathan 2010) domains (e.g., Halpern 2015; Johnson et al. 2012; Thaler and Sunstein 2008). Previous studies on SSA claiming have focused on financial literacy and education (Lusardi and Mitchell 2011) or on information disclosure (Liebman and Luttmer 2015; Martin and Kintzel

2016) as a path to affect claiming age decisions. Distinct from informational approaches, behavioral interventions for claiming decisions have thus far focused on framing effects (Brown, Kapteyn, and Mitchell 2016; Fetherstonhaugh and Ross 1999; Knoll 2011) or on shifting attention toward future benefits (Knoll et al. 2015). Tests of these interventions have produced mixed results in the sense that they do not always yield effects that theory would suggest; for example, gains framing has led to more delayed claiming than losses framing (Brown, Kapteyn, and Mitchell 2016), and providing cumulative payout information has led to earlier claiming—the opposite of its effect on annuity decisions (Shu and Payne 2016). Effect sizes for interventions also vary widely, with the largest effect (a 13-month delay) coming from a query theory intervention that shifts attention to future benefits (Knoll et al. 2015). Additional testing of these existing interventions, and in an environment in which multiple effect sizes can be reasonably compared, is needed. To expand our list of possible interventions beyond those that had been previously tested in the SSA context, we reviewed the types of interventions that had been used in related contexts.

Framing Interventions

In deciding when to claim SSA benefits, workers may evaluate their options relative to a reference point. That is, workers may compare the gains or losses that they would receive as a function of some reference point. For example, claiming benefits at age 64 could be framed either as a loss, as workers' monthly benefits would be lower than had they waited until age 70, or as a gain, as workers' monthly benefits would be higher than had they claimed early at age 62. In one study, losses framing was more persuasive, with respondents reporting later claiming age intentions when a younger age represented a loss of money (Fetherstonhaugh and Ross 1999), while in another, gains framing prevailed as consumers preferred a later claiming age when it was framed as a gain (Brown, Kapteyn, and Mitchell 2016).

Other work has framed payouts either as an annuitized stream (paid monthly)—the standard approach in formal SSA communications—or as a cumulative total of the monthly payouts over time. Individuals provided with a table of cumulative payouts at different live-to ages tend to report earlier claiming intentions (Shu and Payne 2016). A different approach may be to sum monthly payments into an annual total. Although not yet examined in the context of SSA claiming, when retirement wealth is framed as an annuity, survey respondents report higher saving intentions, suggesting that monthly payments seem less adequate than their equivalent lump sums (Goda, Manchester, and Sojourner 2014; Goldstein, Hershfield, and Benartzi 2016).

Normative Messaging

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 SSA claiming domain, normative messages have encouraged hotel guests to participate in an environmental conservation program, and especially so when the messages referred to 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). In the context of SSA claiming, norm-based messaging may 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

The way consumers consider their future selves can affect intertemporal decision making (Hershfield and Bartels 2018). Consumers who feel more emotionally similar to their future selves tend to accumulate more assets over time and 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).

The Role of Information

People have difficulty forecasting how they will feel in the future about decisions that are made in the present (Wilson and Gilbert 2005). In particular, consumers may overestimate both how happy they will be after a positive life event and how negatively they will feel after a suboptimal event (Gilbert et al. 1998). One way of combatting affective forecasting errors is to provide information that aids consumers in better anticipating their future feelings. Although such interventions have not been tested in the SSA claiming context, providing information that highlights the emotional reactions that others have had from (1) claiming too early and later regretting their choice or (2) not having sufficient retirement funds may help consumers better understand the emotional consequences of claiming decisions.

Constructed Preferences Through Self-Reflection

Finally, research in the tradition of query theory has found that people tend to consider immediate benefits before delayed benefits when making an intertemporal choice. Shifting preferences

by directing initial attention toward the delayed benefits of an intertemporal choice, however, can result in less discounting, including for claiming decisions (Knoll et al. 2015; Weber et al. 2007). In a related fashion, 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 trade-offs 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 both preferences and claiming intentions.

Individual Differences Relevant to SSA Claiming

Understanding the effects of heterogeneity on claiming decisions has been an important focus in prior work (Brown, Kapteyn, and Mitchell 2016; Gustman and Stenmeier 2005; Shoven and Slavov 2014). However, much of this research 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 factors may influence the decision-making process that influences claiming intentions. For a list of predictions for how each individual difference relates to claiming age intentions, see the Web Appendix; here, we highlight major elements of some of our measured characteristics.

Personality

In the realm of retirement preparedness, higher levels of conscientiousness predict a higher likelihood of economic preparedness for retirement (Hurd et al. 2012).

Financial Literacy and Numeracy

Lower levels of financial literacy have been linked to lower levels of preparation- for retirement (e.g., Lusardi and Mitchell 2011). Along similar lines, numeracy has been associated with different retirement wealth trajectories, with less numerate consumers showing evidence of poorer 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 (Greenberg 2013). 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 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-term risk concerns inherent in these decisions. In addition, we

also capture differences in loss aversion, since loss aversion and risk aversion can yield different predictions for behavior in the context of claiming decisions (Shu and Payne 2016). Finally, since individual differences in time discounting can have large effects on how future financial outcomes are valued, we measure differences in intertemporal discounting.

Future Self-Orientation

How similar 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 2019). Similarly, the tendency to plan for the future has been linked to credit scores, reflecting an individual's creditworthiness (Lynch et al. 2010).

Demographic Factors

Basic demographic factors such as age, sex, education, income, marital status, dependents, and ownership of 401(k) or pension are related to either actual claiming age or claiming age intentions (Knoll 2011). The CFPB Financial Well-Being scale, a widely used and validated measure of financial health (e.g., Greenberg, Sussman, and Hershfield 2020), should also be predictive of claiming age intentions.

Attitudes Toward Social Security

Perceptions of the solvency of the SSA can affect the timing of claiming decisions (Gustman and Steinmeier 2015). In addition, more psychologically driven 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). High measures of perceived, or psychological, ownership of SSA contributions and benefits can lead to earlier claiming intentions (Shu and Payne 2016).

Overview of Studies

We conducted four large-sample studies. Studies 1 and 2 were conducted using Amazon Mechanical Turk (AMT). Because the active AMT population available to a particular research team at any given time is limited (approximately 7,300 by one estimate; Stewart et al. 2015), recruiting the relevant population (Studies 1–3: participants between ages 40–61; Study 4: participants between ages 50–61) necessitated collecting data in multiple waves to allow for regular turnover in the AMT participant pool. Because the relevant size of the participant pool is unknown for Prolific Academic and for CloudResearch's Prime Panels, Studies 3 and 4 were also conducted in multiple waves. Across all studies, people were allowed to participate only if they had not participated in a previous wave. All measures collected for our studies are reported. The experimental design, data collection plan, and analysis plan for all studies were preregistered, and the

preregistration plans were followed completely (see the Web Appendix for links). The study materials, data, and study code are available at <https://osf.io/uv7s9>.

Study 1

Study 1 aimed to test not only the effectiveness of 13 interventions on claiming age intentions but also the extent to which individual differences predict claiming age intentions. Moreover, we were able to examine several preregistered interactions such that we could determine the extent to which particular individual differences moderated specific interventions.

Participants and Sample

A sample of adults was recruited via AMT (N=4,504; Median_{age} = 46 years). A variety of experiments and correlational studies have found similar results using participants recruited from AMT as compared with participants recruited from representative or probability samples (Snowberg and Yariv 2021). 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, not already receiving SSA 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 4,500 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 .25 standard deviation (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 aimed to have a sample in the control group twice as large as those in the treatment groups. Participants were paid \$2.25 for completing the survey.

Experimental Design

Our experimental design contained one control group and 13 different interventions, for 14 total conditions. The 13 interventions can be separated into five broad classes: payment framing, normative messaging, consideration of the future self, information, and self-reflection.

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

Below is a table that gives typical monthly Social Security payments depending on what age people started to claim their benefits. People who claim Social Security benefits at a younger age (say, 62) end up earning less per month (\$1,234). People who claim Social Security benefits at an older age (say, 70) end up earning more per month (\$2,165).

| Age | Monthly Payment |
|-----|-----------------|
| 62 | \$1,234 |
| 63 | \$1,311 |
| 64 | \$1,410 |
| 65 | \$1,523 |
| 66 | \$1,692 |
| 67 | \$1,760 |
| 68 | \$1,895 |
| 69 | \$2,030 |
| 70 | \$2,165 |

Now, suppose you just turned 60 years old. At what age would you prefer to start claiming your retirement benefits?

Age 62 Age 63 Age 64 Age 65 Age 66 Age 67 Age 68 Age 69 Age 70 I don't know

Figure 1. Control Condition.

comparison for all treatment groups. Figure 1 provides a screenshot of the control condition.

Payment framing. The first class of interventions simply varied the nature of the presentation of the SSA 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 the payment framing category kept the informational content the same but changed how the information was presented. This class of interventions contained three framing treatments: annual framing, gains framing, and losses 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 precisely equivalent: the annual benefits represent the monthly benefits multiplied by 12.

Knoll et al. (2015) used graphical representations to assess the effects of gains framing or losses framing on preferred claiming age, with age 66 serving as a reference point from which gains and losses are determined. Compared with a standard graphical representation, neither gains framing nor losses framing affected preferred claiming age. Our gains and losses framing conditions instead used different reference points (ages 62 or 70, respectively) and relied on numerical rather than graphical information.

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 years old). This frame highlights the gains that can be realized from delaying claiming. For example, compared with a monthly benefit of \$1,234 when

claiming at age 62, a decision to claim at age 68 would represent a gain of \$661 per month.

In the losses 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 latest possible age (70 years old). This frame highlights the losses that are incurred from early claiming. For example, compared with a monthly benefit of \$2,165 when claiming at age 70, a decision to claim at age 64 would represent a loss of \$755 per month.

Normative messaging. The second class of interventions included a brief message about norms regarding claiming SSA retirement benefits. Descriptive norms refer to how people actually 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 that they engaged with the material. This class of interventions contained three framing treatments: descriptive norm, injunctive norm, and a people-like-you message.

Participants in the descriptive norm condition were given information that most people chose to delay receiving SSA benefits (i.e., 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.”

Participants in the injunctive norm condition were given information about what people ought to do regarding claiming SSA benefits: “Delaying your claiming age is a good idea for your financial well-being. Delaying claiming Social Security benefits is a wise choice.”

Participants in the people-like-you condition were given similar information to the overall descriptive norm, but it was matched to the participant's sex 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 the future self. 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. This class of interventions contained three variants: future-self focus, benefits to future-self focus, and future-family benefits focus.

In the future-self focus condition, 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."

In the benefits to future-self focus condition, participants read the same information as in the future-self focus condition, 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.

In the future-family benefits focus condition, participants were prompted with similar wording to the future-self focus condition but asked to imagine their family, rather than just themselves, in the future, and to consider the impact of the claiming decision on future benefits as in the benefits to future-self focus condition.

Information. The fourth class of interventions provided participants with contextual information about people's needs during retirement. We tested the effects of interventions for two types of information: insufficiency of retirement funds and commonality of regret.

In the insufficiency of retirement funds condition, 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." Participants were then asked to report what they learned to ensure that they engaged with the message.

In the commonality of regret condition, 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).

Participants were then asked to report what they learned to ensure that they engaged with the message.

Constructed preferences through self-reflection. The fifth and final class of interventions primarily asked participants to reflect on their own thoughts. We examined the effects of two self-reflective interventions: reason generation and right-tail longevity.

The first self-reflection condition—reason generation—relies on insights from query theory, which supposes that the order in which aspects of a decision are considered affects preferences and, thus, the final decision. We used a modified version of a query theory intervention used to affect claiming decisions (Knoll et al. 2015) that departs from query theory. Rather than asking participants to first consider reasons to claim benefits later and then consider reasons to claim benefits earlier, we instead encouraged them to list reasons why it would be good to receive benefits later or bad to receive benefits earlier. Participants reported one thought at a time, generating their own reasons for claiming earlier versus later.

Participants in the right-tail longevity condition were prompted to think about 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 condition 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 forgone by not claiming earlier.

Claiming Age Intentions

We assessed claiming age intentions alongside information that is typically found on the SSA webpage or through the CFPB. Participants first read basic information about SSA 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 (for participants in the treatment conditions), 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 an "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 small minority of participants who reported "I don't know." Note that if we exclude participants who indicated "I don't know" before reporting their claiming age intentions, the results are substantively similar. Participants then completed the set of individual difference measures.

Individual Differences and Potential Moderators

After indicating claiming age intentions, all participants responded to a set of individual difference measures. 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 pre-screening 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. 2010); 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 similarity (Ersner-Hershfield et al. 2009); a six-item measure assessing susceptibility to interpersonal influence (Bearden, Netemeyer, and Teel 1989); subjective probabilities of living to age 65, 80, and 95, which were used to calculate subjective life expectancy (Payne et al. 2013); and the five-item version of the CFPB Financial Well-Being Scale.

Finally, we assessed participants' attitudes toward the SSA by asking them to assess the extent to which they expect to rely on SSA benefits, their subjective knowledge about SSA benefits (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 of their SSA benefits (Peck and Shu 2018; Shu and Payne 2016).

Analysis Plan

Our preregistered analysis plan proceeded in the four stages. First, we analyzed intended claiming age as a linear function of 13 indicator variables, one for each condition. This allowed us to assess the causal effect of each condition on claiming age against the control condition. Second, we repeated that same analysis while including sex, age, and income as controls. 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 conditions, sex, age, and income. Fourth, to the second specification we added one of 23 theoretically relevant preregistered interactions (see the Web Appendix), along with the component individual difference measure.

Results

The median survey duration was 15 minutes. Aggregating across all treatments, the median time spent on the intervention and the claiming age decision was 77 seconds ($M = 107$ s, $SD = 123$ s). The first finding to note is that, aggregating across all treatments, participants intended to claim later (Median = 68 years; $M = 67.1$ years, $SD = 2.8$) than the current distribution of true claiming ages would suggest ($M_{2010} = 63.5$ years, $M_{2019} = 64.6$ years; as calculated previously [see footnote 2]). As with most such experiments, the *differences* between conditions are likely more informative than the *levels*. Note that in Study 4, with a somewhat older sample, the average intended claiming age is somewhat lower than in Studies 2 or 3. This is consistent with the finding that intended claiming age decreases as retirement approaches.

Interventions. For full results of preregistered analyses, see Tables W1 and W2 in the Web Appendix. Collectively, the conditions had an effect on claiming age intentions, given a significant omnibus test ($F(13, 4,490) = 2.72$, $p < .001$). Figure 2 includes estimates and 95% confidence intervals for condition means controlling for sex, age, and income (see Figure W1 in the Web Appendix for raw condition means). Again, the conditions had an effect on claiming age intentions above and beyond the controls, given a significant model comparison test against the controls-only model ($F(13, 4,369) = 2.98$, $p < .001$); degrees of freedom are reduced due to missing values of one or more covariate. Hereinafter, we describe estimates with controls at their mean levels, giving equal weight to men and women, but the pattern of results is extremely similar when excluding controls.

Next, we briefly report the effects of each intervention on claiming age intentions relative to the control group ($M_{\text{control}} = 66$ years and 9 months; see Table W1 in the Web Appendix). The self-reflection treatments exhibited the largest effects relative to control: the reason generation intervention generated a 9-month delay in average claiming age intentions and the right-tail longevity intervention generated an 8-month delay in average claiming age intentions. That is, generating one's own reasons to delay or explicitly considering the consequences of claiming too early leads to later intended claiming age.

Four other treatments had significant effects compared with the control group. The benefits to future-self focus and commonality of regret conditions each led to significantly more delayed claiming intentions (7 months), and the injunctive norm (6 months) and gains framing (5 months) conditions led to significantly more delayed claiming intentions as well.

Although we do observe that, overall, there were significant differences across the 14 conditions, we also unexpectedly found that seven of the interventions had no significant effect relative to the control group. These apparently ineffectual treatments were annual framing, losses framing, descriptive norm, people-like-you messaging, future-self focus, future-family benefits focus, and insufficiency of retirement funds.

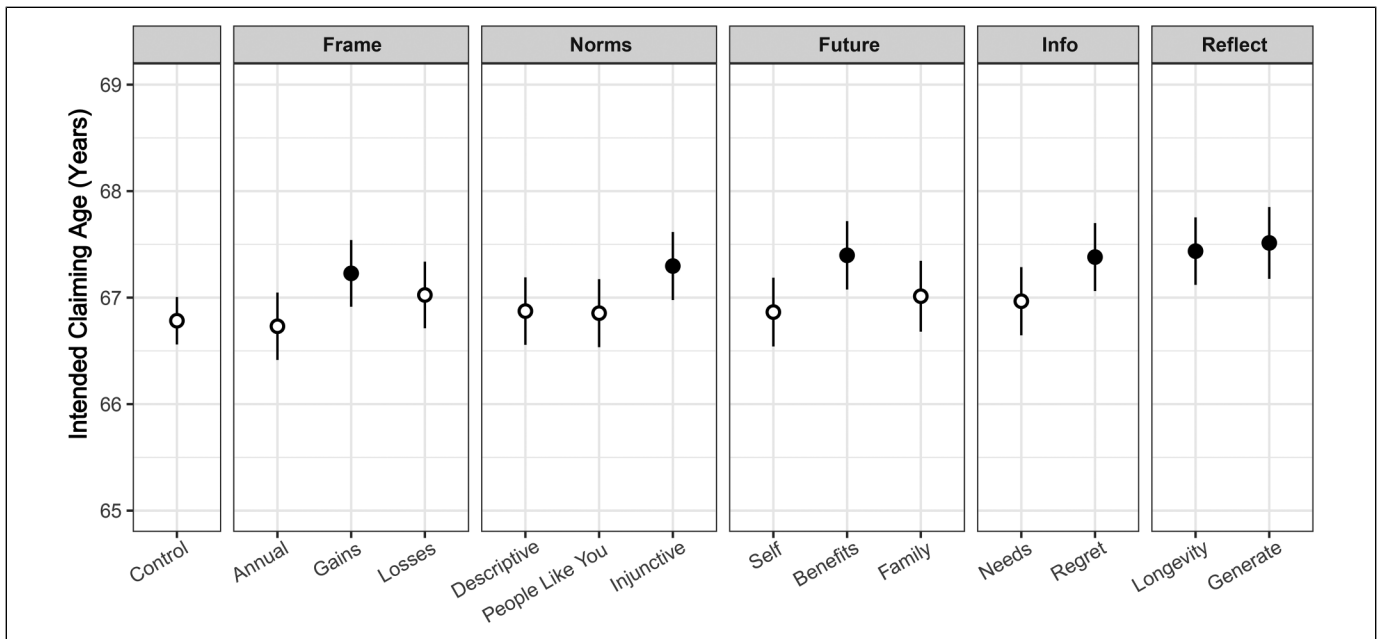


Figure 2. Study 1 Adjusted Condition Means.

Notes: Condition means adjusted for sex, age, and income. Error bars represent 95% confidence intervals of the condition means. Filled circles represent significant comparisons ($p < .05$) relative to the control condition.

Individual differences. As shown in three panels of Figure 3, several of the measured individual differences were significantly linked to claiming age intention, controlling for age, income, and sex (see Table W2 in the Web Appendix for the coefficients).

The top panel shows the Big Five personality characteristics, five factors that help 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 is related to claiming intentions.

The second panel assesses a variety of measures regarding an individual's financial status and abilities. The greater their financial well-being, the earlier they intend to claim. The greater their financial literacy, numeracy, and especially intertemporal discount factors,³ the later they intend to claim. Measures of future-self similarity, financial risk taking, interpersonal influence, loss aversion, and propensity to plan did not significantly predict claiming age intentions.

The third panel represents attitudes and beliefs directly related to SSA benefits. The better an individual's subjective health and the longer their subjective life expectancy, the later they intend to claim. Higher expectations that they will rely on SSA benefits were marginally significantly associated with delayed claiming intentions. In contrast, the more they expect the SSA to be solvent when they claim, the more they claim to know about SSA benefits, and the more they feel a sense of ownership of them, the more likely they are to intend to claim earlier.

Although not preregistered, analyses in which all of these individual differences appear in the same model yield very similar effects, with a few exceptions. First, the relationship between financial literacy and claiming age and that between subjective health and claiming age are marginally significant. Second, numeracy and emotional stability are nonsignificant predictors of claiming age. Finally, loss aversion is a marginally significant negative predictor of claiming age.

Interactions. Of the 23 theoretically motivated interactions we preregistered that we would test (out of $20 \times 13 = 260$ possible interactions), 3 emerged as statistically significant, as shown in Table W3 in the Web Appendix. Because these interactions did not replicate in Studies 2–4 (see the Web Appendix for additional analyses), we do not discuss them further here.

Studies 2–4

The aim of Studies 2 and 3 was to directly replicate significant effects from Study 1. We followed a design that was similar to that used in Study 1, yet far shorter, by eliminating individual difference measures that were not critical to the replications. The aim of Study 4 was to directly replicate significant effects from Studies 1–3 among a sample that is even closer to retirement age (people between ages 50–61) and less likely to be seasoned research participants.

Method

In Study 2, a sample of adults prescreened to be between ages 40 and 61, and who did not participate in Study 1, was recruited

³ Lower intertemporal discount factors indicate higher discount rates (i.e., greater preference for immediate over delayed payoffs).

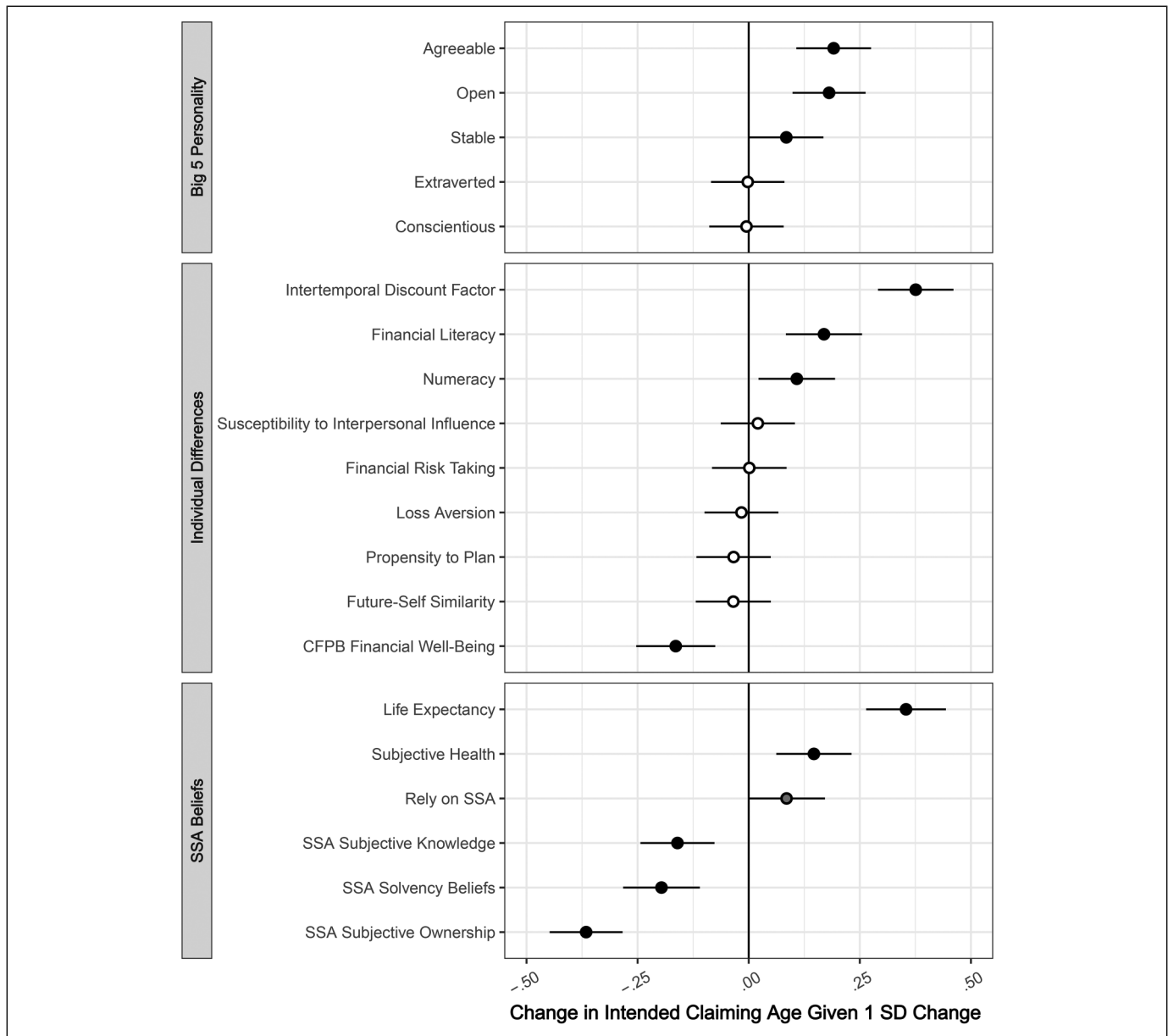


Figure 3. Study 1 Personality, Individual Differences, and Beliefs Coefficients.

Notes: Coefficients on personality, individual difference, and belief measures. Error bars represent 95% confidence intervals. Coefficients represent expected change in intended claiming age (in years) based on a 1 SD change in the underlying measure. Filled circles represent significant coefficients (black represents $p < .05$; gray represents $p < .1$).

via TurkPrime using the AMT participant pool ($N=3,010$; $Median_{age}=47$ years). In Study 3, a sample of adults prescreened to be between ages 40 and 61 was recruited via Prolific ($N=3,020$; $Median_{age}=47$ years). In addition, Prolific ensured that participants were residents and citizens in the United States. Participants were paid \$1 for completing the survey for Studies 2 and 3. In Study 4, to ensure that our stimuli were even more relevant for our sample, we recruited adults prescreened by CloudResearch to be between ages 50 and 61 via Prime Panels ($N=2,711$; $Median_{age}=56$ years; Chandler et al. 2019). As in Study 1, the control group was twice as large as each of the treatment groups for Studies 2–4.

In Studies 2 and 3, our experimental design contained one control group and eight interventions, for nine arms total. Of the eight interventions included, seven were identical to those included in Study 1: gains framing, injunctive norm, future-self focus, benefits to future-self focus, commonality of regret, reason generation, and right-tail longevity. Six of these interventions were found to be significant in Study 1. We chose to also retain the future-self focus intervention since there was a significant interaction between future-self focus and future-self similarity in Study 1. We also included a descriptive norm condition, which differed from that included in Study 1. In particular, participants in this condition were informed that “millions of adults” rather than

“about 6 out of 10 adults” currently choose to delay claiming SSA benefits. Study 4 contained all of the conditions included in Studies 2 and 3, except for the future-self focus condition.

To focus on the most essential individual differences and reduce survey duration, we asked participants in Studies 2–4 to respond to a subset of the measures used in Study 1. In addition to a shorter set of demographic questions, we measured intertemporal discounting preferences and loss aversion. We also included the subjective life expectancy probabilities and assessed participants’ beliefs about SSA solvency and perceived ownership of their benefits. Whereas Studies 2 and 3 assessed future-self similarity, Study 4 did not.

Results

Aggregating across all treatments, the median time spent on the intervention and the claiming age decision was 71 seconds ($M = 102$ s, $SD = 204$ s) for Study 2, 69 seconds ($M = 98$ s, $SD = 119$ s) for Study 3, and 58 seconds ($M = 85$ s, $SD = 116$ s) for Study 4. Overall attrition rates—based on those who did not answer the last question of the survey, conditional on answering the first question in the survey (i.e., sex)—were 4.5%, 2.8%, and 20.5% for Studies 2, 3, and 4, respectively. Because Qualtrics did not save incomplete responses for Study 1, attrition rates for that study are not available. Although there are some differences in attrition based on condition (see Table W4 in the Web Appendix), we found no consistent differences across conditions by age, gender, or income.

In Studies 2 and 3, our preregistered analysis plan proceeded in the same four stages as those in Study 1. However, these studies were only concerned with testing eight interventions, six individual differences, and the three significant interactions found in Study 1. In Study 4, our preregistered analysis plan was similar but did not include the effect of the future-self focus intervention, future-self similarity measure, or their interaction, as neither the intervention nor the measure was included in the study. Therefore, Study 4 was concerned with testing seven interventions, five individual differences, and two interactions.

As in Study 1, aggregating across all treatments, participants intended to claim later (Study 2: Median = 68 years; $M = 67.1$ years, $SD = 2.9$; Study 3: Median = 68 years; $M = 67.1$ years, $SD = 2.8$; Study 4: Median = 66 years; $M = 66.0$ years, $SD = 3.2$) than the current distribution of true claiming ages would suggest (63.5 to 64.6 years), so we again focus on differences rather than levels.

Interventions. For full results of preregistered analyses, see Tables W5–W8 in the Web Appendix. As in Study 1, the treatments collectively affected claiming age intentions (Study 2: $F(8, 3,001) = 4.92$, $p < .001$; Study 3: $F(8, 3,011) = 4.33$, $p < .001$; Study 4: $F(7, 2,703) = 3.43$, $p = .001$). Figure 4 includes estimates and 95% confidence intervals for condition means controlling for sex, age, and income (for raw condition means, see Figure W2 in the Web Appendix). Again, the treatments affected claiming age intentions above and beyond the controls, given a significant model comparison test against

the controls-only model (Study 2: $F(8, 2,954) = 5.31$, $p < .001$; Study 3: $F(8, 2,959) = 4.17$, $p < .001$; Study 4: $F(7, 2,590) = 3.40$, $p = .001$). While we focus the discussion of the results on the models including controls, the estimates and pattern of results are substantively similar. Although average intended claiming age was lower in Study 4, and more closely aligned with realized claiming age in the population, the differences among conditions were extremely similar.

Tables W5–W7 in the Web Appendix include the main effects of the treatments. As in Study 1, we report the effects of each intervention on claiming age intentions relative to the control group (Study 2: $M_{\text{control}} = 66$ years and 10 months; Study 3: $M_{\text{control}} = 66$ years and 8 months; Study 4: $M_{\text{control}} = 65$ years and 6 months). The main effects of all six interventions that significantly delayed claiming intentions in Study 1 replicated in at least two of the three replication studies (significant comparisons included in parentheses). In particular, the gains framing (Study 2: 4 months later relative to control, Study 3: 7 months later relative to control; Study 4: 6 months later relative to control), injunctive norm (Study 2: 4 months later, Study 3: 9 months later; Study 4: 9 months later), benefits to future-self focus (Study 2: 2 months earlier, Study 3: 4 months later; Study 4: 6 months later), commonality of regret (Study 2: 2 months later, Study 3: 5 months later; Study 4: 9 months later), reason generation (Study 2: 6 months later, Study 3: 4 months later; Study 4: 8 months later), and right-tail longevity (Study 2: 10 months later, Study 3: 11 months later; Study 4: 11 months later) interventions all replicated in at least two of the three studies. Although the baseline descriptive norm condition was not significant in Study 1, the modified descriptive norm condition emphasizing “millions of adults” rather than “about 6 out of 10 adults” was significant in Study 3 (5 months later), though not in Studies 2 (1 month later) or 4 (3 months later).

Individual differences. Figure 5 shows how six measured individual differences are linked to claiming age intention, controlling for age, income, and sex (see Table W8 in the Web Appendix for the coefficients). As in Study 1, greater intertemporal discount factors were significantly associated with later claiming, and measures of future-self similarity and loss aversion were not. In addition, we again found that subjective life expectancy predicted later claiming. We replicated the negative relationship between perceived ownership of SSA benefits and claiming age in Studies 2 and 3, but not in Study 4. The negative relationship between beliefs about SSA solvency and claiming age significantly replicated only in Study 3. Although not preregistered, analyses in which all of these individual differences appear in the same model yield very similar effects, except that beliefs about SSA solvency are a significant negative predictor of claiming age in Study 2 and that perceived ownership of SSA benefits is a significant negative predictor of claiming age in Study 4.

Discussion

Across four preregistered experiments, we test a set of interventions and individual differences theorized to affect the SSA

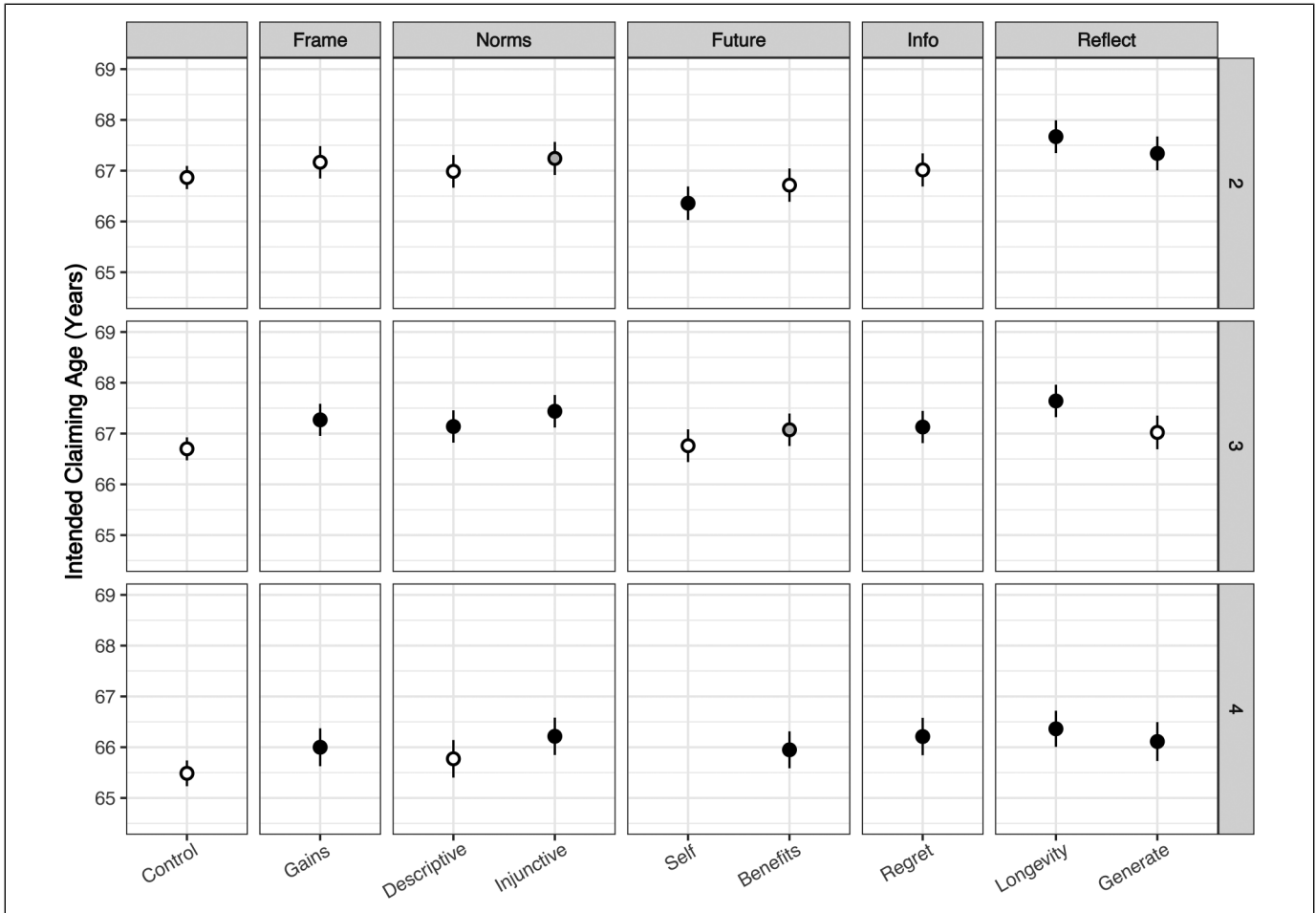


Figure 4. Studies 2–4 Adjusted Condition Means.

Notes: Condition means adjusted for sex, age, and income. Error bars represent 95% confidence intervals of the condition means. Filled circles represent significant comparisons (black represents $p < .05$; gray represents $p < .1$) relative to the control condition.

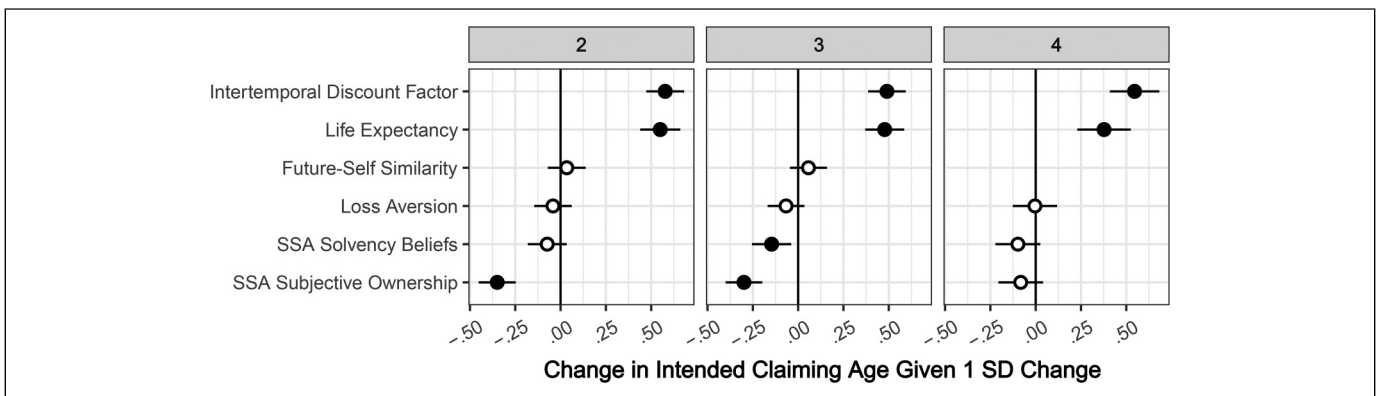


Figure 5. Studies 2–4 Individual Difference Coefficients.

Notes: Coefficients on individual difference measures. Error bars represent 95% confidence intervals. Coefficients represent expected change in intended claiming age (in years) based on a 1 SD change in the underlying measure. Filled circles represent significant coefficients ($p < .05$).

benefits claiming decision. Study 1 tested the effectiveness of 13 theory-driven conditions on claiming age and found evidence for 6 effective interventions. To overcome potential issues with multiple hypothesis testing and to ensure the

robustness of these findings, we aimed to replicate each of these six interventions in follow-up studies with diverse samples and were able to successfully replicate all of them in at least two of the follow-up studies, including right-tail

longevity (Studies 2–4), injunctive norm (Studies 2–4), benefits to future-self focus (Studies 3 and 4), gains framing (Studies 3 and 4), commonality of regret (Studies 3 and 4), and reason generation (Studies 2 and 4). Table W9 in the Web Appendix summarizes the findings across Studies 1–4. Moreover, the relationships between claiming age and four individual differences were replicated in at least two of the three follow-up studies: delayed claiming was associated with greater intertemporal discount factors (Studies 2–4), greater expected longevity (Studies 2–4), and lower perceived ownership of SSA benefits (Studies 2 and 3).

General Discussion

Choosing when to claim SSA benefits is a critical determinant of financial health during retirement for Americans. While previous work across the social sciences has examined heterogeneity in claiming decisions (e.g., Brown, Kapteyn, and Mitchell 2016; Gustman and Steinmeier 2005; Knoll 2011; Knoll et al. 2015; Liebman and Luttmer 2015; Shu and Shu 2018), no research to date has systematically tested the psychosocial determinants of early or delayed SSA claiming. Given that prior research has been scattered across disciplines and has typically tested one intervention or individual difference at a time, we took a different approach and systematically examined how several different interventions and individual differences affect when consumers intend to claim SSA benefits.

Findings from four large-scale, preregistered experiments demonstrate the potential of several interventions and individual differences that relate to SSA claiming. Of the 13 original interventions tested in Study 1, the 6 interventions found to be significant replicate at least twice in Studies 2–4. We also find several individual differences, including intertemporal discount factors, subjective life expectancy, and perceived ownership of SSA benefits, that significantly replicate in at least two of the three follow-up experiments. Notably, some of the interventions for which we obtained null effects, such as those that leveraged information, future-self focus, and loss aversion, have been shown to be effective in other financial domains (see Greenberg and Hershfield 2019), which suggests that it is important to consider substantive differences between financial choices. While some of these effects, such as the impact of reason generation and gains framing, are consistent with prior work (Brown, Kapteyn, and Mitchell 2016; Knoll et al. 2015), other interventions, such as those based on norms and regret, are relatively new to the claiming literature. We are hopeful that future work will build on these findings to explore other claiming interventions based on social influence and affect.

Of the 23 preregistered interactions between interventions and individual differences for which we hypothesized effects, we only found initial evidence for 3, none of which replicated in the two follow-up studies. However, we do not interpret this lack of significant findings as a decisive strike against the potential of personalized interventions. It speaks to the difficulty of thoughtfully testing for such interactions in a large-scale experiment such as this. Our lack of findings could be

the result of small effect sizes or simply that the 23 interactions our hypotheses and testing focused on were not the most effective of the 260 possible interactions within this design.

Indeed, post hoc analyses yielded some significant interactions that are worth noting. First, in Studies 1 and 4, there was a negative interaction between the benefits to future-self focus intervention and whether the participant was married. This finding suggests that considering one's own future gains may be more effective among unmarried adults. Second, in Study 1, there was a positive interaction between the annual framing intervention and the intertemporal discount factor. This finding suggests that when income feels larger—as is the case when benefits are presented annually rather than monthly—the benefits to delaying seem larger, especially among those who discount the future less. Third, perceived ownership of SSA benefits interacted positively with the descriptive norm intervention (in Studies 2–4; marginally in Study 2) and negatively with the benefits to future-self focus intervention (in Studies 2 and 3). Since perceived ownership captures how much a participant perceives the benefits as “mine,” shifting focus to other possible recipients (including the future self) might change the desire to have them sooner versus later. Finally, in Studies 1 and 2, the commonality of regret intervention was more effective among those with fewer years of education. We note that these findings are based on post hoc analyses and offer them as suggestions for future work to investigate further.

In summary, after systematically testing the impact of theory-driven interventions and individual differences on SSA claiming age, we found robust evidence for six interventions and four individual differences. These findings suggest that there may be several methods for nudging SSA claiming behavior as well as substantial heterogeneity in the adult population.

Theoretical Contributions

The current research contributes to our understanding of SSA claiming and, more broadly, intertemporal consumer financial decisions. Like many financial choices, SSA claiming depends on a complex set of economic and psychological factors (Greenberg and Hershfield 2019). In addition to leveraging prior work on SSA claiming, we draw from many strands of research in behavioral economics and consumer psychology to examine which factors can cause people to delay SSA claiming. To our knowledge, we provide the first systematic test of interventions alongside psychologically distinct individual differences relating to the SSA claiming decision.

Although we did not have *ex ante* predictions about which interventions would be most effective, the data across the four experiments offer some surprising insights into the types of nudges that can move consumers toward delaying SSA claiming. First, several of the consistently effective interventions are suggestive that delaying is the “right” choice. Indeed, in the case of normative messaging, the injunctive norm intervention had a large effect on delayed claiming, whereas the results for the descriptive norm interventions

were mixed. In addition, information was effective when it conveyed that people regretted claiming too early, but not when it was merely about one's financial needs during retirement. It is also notable that the interventions that require self-reflection—namely, the right-tail longevity and reason generation interventions—resulted in delayed claiming. In addition to requiring input from the participant, these interventions also conveyed the notion that delaying was the “right” choice. Therefore, we speculate that interventions that communicate delaying as a better course of action may be especially effective in moving consumers toward delaying SSA claiming.

Second, another general class of interventions that was especially effective includes those that specify financial benefits from delayed claiming. For instance, whereas the benefits to future-self focus intervention encouraged delayed claiming, the future-self focus intervention did not. Similarly, the gains framing intervention was generally effective, but the annual framing intervention was generally not. That a key difference between these effective and ineffective treatments was the presence of the specific financial benefit from delaying suggests that the financial benefit may play a role in which interventions are more effective. It is worth mentioning that the gains framing intervention, but not the losses framing intervention, was effective. This result is surprising, as it stands in contrast to what decades of research on loss aversion would predict (see, e.g., Gal and Rucker 2018). As neither intervention interacted with individual differences in loss aversion, this suggests that though the framing addressed losses, the psychological impact may have manifested differently. We hope that future research can further unpack these categories and examine categories that can help consumers make better SSA claiming decisions.

Limitations, Marketing Implications, and Directions for Future Research

We acknowledge that the current research has a few limitations. First, like much behavioral research, this work relies on web-based subject pools, which are not fully representative and may have participants who are not fully attentive. Second, the outcome variable across all studies is intended, rather than actual, claiming age. Although hypothetical claiming age is a strong predictor of actual claiming age (Brown, Kapteyn, and Mitchell 2016) and is widely used in prior research on SSA interventions, it is not possible to determine whether any of the reported effects would be weaker or stronger if implemented at the time actual claiming decisions are made. Recent work has shed light on discrepancies between intentions and actual behavior whereby effects on hypothetical measures do not extend to effects on behavior and vice versa (Dai et al. 2021). It is, therefore, possible that should an intervention be employed, people may not sufficiently attend to the intervention, resulting in smaller effects, or may be motivated in ways that are not present in hypothetical settings, resulting in larger effects. Third, while careful attention was given to the design

of the interventions and the choice of individual differences, other researchers may have made different choices that might have led to different sets of results. For example, there are numerous ways to display normative messages and measure risk preferences; we see some suggestive evidence for differences based on how the descriptive norm is conveyed in comparing Study 1 with Studies 2 and 3. Finally, recent work has highlighted that the literature on the effects of behavioral interventions suffers from substantial heterogeneity and publication bias (Mertens et al. 2022a; see also Mertens et al. 2022b). Given that the evidence on behavioral interventions is rapidly evolving, we (and other researchers) might have opted to choose interventions that showed consistently strong effects in light of such new evidence. We hope that future research follows a similar paradigm to examine the effects of alternate interventions, measures, and constructs to bear on the SSA claiming decision and on financial decisions more generally.

It is essential to note that interventions ideally ought to be employed only among those who would benefit from delayed claiming—for example, people who have reasonable signals of longevity or more financial resources. We remain cautious about normative statements that delayed claiming is the optimal choice for every household, or whether interventions that successfully influence people to delay claiming would be beneficial in every situation. Indeed, it is likely that delayed claiming is deleterious for many consumers.⁴ Future work and eventual implementation should carefully consider the targeting of such interventions to ensure a high likelihood that those targeted will benefit. In addition, given the substantial heterogeneity in optimal claiming age, future research should leverage these findings to further examine how personalized interventions that are targeted to the individual can lead to improved claiming decisions (Sunstein 2013). Testing for the effects of such personalized interventions can be methodologically challenging due to the large sample sizes required. However, we hope that the approach of conducting preregistered analyses of interactions between interventions and individual differences described here can be helpful in advancing their development.

The current work has direct implications for policy makers, financial planners, and consumer finance organizations. Previous research 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). Moreover, SSA materials include several appeals, including those that focus on

⁴ Because those who expect to die younger and those without other retirement income sources are less likely to benefit from delayed claiming, we examined the effect of two additional sets of interactions on intended claiming age. Specifically, we tested a model predicting intended claiming age using whether the participant had a pension, their subjective life expectancy, and the interaction terms between the intervention and each of these two measures; we then tested an analogous model that considered whether the participant had a 401(k) instead of whether they had a pension. These analyses did not yield any consistent effects across studies.

benefits to the future self and right-tail longevity (SSA 2022b). The interventions tested here fall into several of these categories and offer some insights into which approaches may be the most effective as well as which are less likely to affect consumers' choices. Building on the current findings regarding which interventions and individual differences matter for SSA claiming, through further testing of interactions between different interventions and individual differences, policy makers such as the CFPB could match individuals to interventions according to their psychographic profiles. For 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. It is likely that interventions would be most effective when employed "just in time" (Fernandes, Lynch, and Netemeyer 2014), such as when consumers make decisions with financial planners or when they engage with online resources near retirement age. However, because consumers may choose to delay (or not) at multiple points in time, it may be useful to implement them just before age 62, then offer a "booster" over time. Further work is needed to identify the optimal touchpoints for eventual implementation.

This work also provides a basis for future large-scale tests of interventions and individual differences relevant to SSA claiming. Little work has simultaneously tested the effects of a set of interventions designed to affect SSA claiming age intentions, or how people differ with respect to their claiming choices. These findings represent an initial investigation of these topics. While this article sets the groundwork to examine interventions and individual characteristics, future research should focus on large-scale tests of interventions and individual differences among retirement-age adults and follow actual claiming choices. Such a large-scale study would allow for data-driven predictions that would help policy makers better model the claiming choice. In addition, the SSA itself could enrich its materials for older adults by leveraging these insights.

Conclusion

This research tested the effectiveness of several theory-driven interventions meant to help consumers better reason about SSA claiming age, the role of individual differences in claiming age intentions, and interactions between interventions and individual differences on claiming age intentions. Across four pre-registered experiments, we found robust evidence for promising levers that can be employed by policy makers to help improve consumer decision making in a highly consequential and complex financial domain.

Associate Editor

Eric Johnson

Declaration of Conflicting Interests

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