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The role of affect and social norms in preferences for guaranteed income streams in retirement

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Abstract:

Decumulation decisions require individuals to consider a range of factors, including not only financial outcomes but also family needs and retirement goals. An underexplored factor in these decisions is the role of positive and negative affect–or, more explicitly, the emotional content of retirement messages delivered to consumers. This paper describes a series of empirical analyses and experimental studies to explore the role of affect in behavioral retirement insurance decisions (e.g., annuitization) and also tests a social norms intervention to encourage interest in annuity uptake. We consistently find that individuals who are younger and who have higher positive affect regarding retirement are more interested in annuities, suggesting a role for targeting of annuity messages to these consumers. A social norms intervention that increases the perception that other retirees buy annuities also significantly increases annuity interest among our study participants. Better understanding of these factors may allow us to better develop products that directly address retirees' affective concerns, as well as better communicate with plan participants about how insurance products or other decumulation options can align with their needs.

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Introduction

Securing sufficient income during old age requires that individuals make a series of long-range decisions both during their working years and in early retirement. One of the most complex of these decisions is how to optimally consume saved assets. The size of this problem is substantial, with approximately $16.3 trillion in retirement assets held in either defined contribution plans (e.g., a 401(k)) or IRAs (Investment Company Institute, 2019). Individuals must trade off the risk of spending their retirement assets too quickly and running out of money against the constraints of spending too slowly and possibly dying with unused funds. Further complicating this decision, in addition to the high value of financial outcomes involved, are concerns about health and quality of life in retirement, and significant uncertainty about life expectancy, a crucial piece of knowledge for determining the optimal consumption path.

One marketplace option for solving the problem of generating secure retirement income from accumulated retirement wealth is a life annuity. The simplest form of a life annuity is the immediate single-payer life annuity, in which a consumer exchanges a lump sum of assets for a guaranteed stream of lifetime payments. By converting retirement assets into a lifetime income stream, life annuities' biggest advantage is the elimination of the risk of outliving one's assets. Another advantage is that life annuities tend to pay out a higher percentage return than most individuals can achieve via self-managed accounts due to benefits to survivorship within the pool of annuity purchasers. However, consumers tend to perceive several possible downsides to life annuities. Bequest motives (i.e., concern with smaller eventual payouts for heirs) have been found to decrease life annuity uptake (Lockwood, 2018). Additional perceived disadvantages include negative returns relative to purchase price (breakeven), loss of control of the assets, and poor liquidity for emergencies. Companies that offer annuities have introduced options, such as period certain guarantees, to address these downsides, but take-up of life annuities among retirees remains lower than expected by theoretical models (Davidoff, Brown, and Diamond, 2005).

A rational model of annuity decisions requires that buyers consider issues of preferred retirement age, return on personal assets, longevity risk, and expected age of death. While many of these trade-offs are purely financial in nature, psychological influences can also have a large impact on the annuity decision. For example, the anxiety and negative emotions that come from thinking about uncertainty and the end of life may heavily influence the decision-making process, as might thoughts of being lonely and isolated due to a constrained financial situation while retired. Positive thoughts about family, travel, and other retirement goals could also affect decisions. To address the underexplored role of these emotional considerations, the research described in this manuscript focuses specifically on the impacts of positive and negative emotion on retirement decision making.

Specifically, using methodology from behavioral decision making and psychology, we examine how affective reactions like positive and negative emotions and anxiety affect retirement goals and annuity decisions. While economic trade-offs in retirement income decisions have been regularly studied in the literature, there has been almost no investigation of how current and anticipated affect (i.e., emotional judgments of outcomes) shapes the insurance decision. In this project, our studies consistently find that individual levels of positive affect toward retirement can have a positive effect on interest in annuity uptake. We also find that younger participants (within the preretirement age band of 45-62) and those who expect to live longer are more interested in annuities. This paper also tests options for communicating with participants in ways that align products with their affective needs, such as the use of social norms to influence interest in life annuity take-up. We find that an intervention highlighting the number of current retirees purchasing annuities, a high social norm, significantly increases interest in annuities. Our paper begins with reviews of the relevant literature on annuity choice, emotion in decision making, and social norms as an intervention for behavior change. We then present a series of experimental studies that test our predictions regarding the interactions between affect, social norms, and annuity choice.

Background literature

Annuity decision making

Guaranteed income solutions during retirement are an essential element of reducing retirement uncertainty, and yet savings plan participants often fail to make optimal decisions that reduce risk and maximize retirement income. The economics literature has long recognized that annuities are the most compelling solution to the decumulation problem (for a review, see Benartzi et al., 2011), arguing that rational retirees with no bequest motive should use all of their retirement assets to buy annuities (Yaari, 1965). Life annuities eliminate the risk of outliving one's assets (longevity risk) while also offering a mortality premium on returns due to the likelihood that some people in the annuity pool will die early. Davidoff, Brown, and Diamond (2005) provide a simple analysis of the attractiveness of annuitization.[1] Even with all the theoretical reasons to purchase life annuities, retirees' actual purchase of annuities remains below their theoretical potential, leading to a so-called annuity puzzle (Davidoff, Brown, and Diamond, 2005; Brown, 2007). For example, a 2009 study by Hewitt Associates finds that just 1% of U.S. employees actually buy annuities as payout options (Lieber, 1/29/2010), and a study in the United Kingdom found that only about 6% of households there participate in the voluntary annuity market (Inkmann, Lopes, and Michaelides, 2011). Brown (2007) provides an excellent summary of the economic explanations for why a person might not buy some amount of a life annuity, including price premiums due to adverse selection by individuals with longer life expectancies, but also argues that annuities are a rational choice for many consumers and that reasons to not purchase may lie in the behavioral rather than economic sciences.

As described by Brown (2007), possible reasons for limited demand for annuities include rational heterogeneous preferences at the consumer level. As noted above, such reasons may include limited current retirement savings, bequest motives, concerns about liquidity, risks of inflation, and default risk. However, several authors have looked closely at these concerns and found limited support for them as full explanations for the annuity puzzle (e.g., Webb, 2009; Brown, 2007; Babble and Merrill, 2006). Furthermore, to address some of these concerns, companies offering life annuities have introduced a variety of options in an effort to make annuities more attractive. These options include attributes such as period-certain guarantees, deferred start dates, annual income increases to compensate for inflation, and joint annuities for married couples. Even with these additions to the marketplace, consumer adoption of annuities remains below theoretically suggested levels.

Given that retirees remain reluctant to buy annuities, some have suggested that the reasons are psychological rather than rational (Brown, 2007; Benartzi et al., 2011). Economic and behavioral research has documented non-optimal decision making for a wide variety of guaranteed income solutions, including pensions, annuities, and Social Security benefits (e.g., Davidoff, Brown, and Diamond, 2005; Brown, 2007; Shoven and Slavov, 2012; Scott, 2012). Behavioral reasons for lack of optimal decisions around guaranteed income, including annuities, have included biases such as loss aversion, framing, temporal myopia, and fairness (Benarzti, Previtero, and Thaler, 2011; Hu and Scott, 2007; Brown, 2007; Beshears, Choi, Laibson, Madrian, and Zeldes, 2014; Mitchell, Poterba, Warshawsky, and Brown, 1999; Shu, Zeithammer, and Payne, 2016; Shu and Shu, 2018). While there is mounting experimental evidence to support these behavioral explanations, as well as attempts at designing interventions to respond to these biases, a large number of additional behavioral explanations for consumer underinsurance are yet to be explored.

Turning specifically to psychological explanations for the annuity puzzle, some researchers have focused on the framing of the annuity decision. Hu and Scott (2007) argue that people narrowly frame the annuity

[1] They compare a one-year certificate of deposit to a security that "pays a higher interest rate at the end of the year conditional on living, but pays nothing if you die before year-end," and they conclude that "if you attach no value to wealth after death, then the second, annuitized, alternative is a dominant asset" (p. 1573).

purchase as a gamble, rather than as an insurance decision, due to the complexity of the task. Loss aversion from cumulative prospect theory (Tversky and Kahneman, 1992) is also widely invoked as a reason why annuities are less attractive than economic theory would predict, especially when individuals are thinking about the potential loss of the annuity purchase price due to early death. To address framing issues, Brown, Kling, Mullainathan, and Wrobel (2008) test reframing the annuity decision either in terms of an investment (using words such as invest and earnings) or in terms of consumption (using words such as spend and payment) and find that consumers like annuities more in the consumption frame. Agnew, Anderson, Gerlach, and Szykman (2008) also find framing effects, mediated by gender, in a "Retirement Game" in which subjects choose between annuities and self-managed market investments. These behavioral approaches to the annuity puzzle through framing interventions provide important insights to aspects of the annuity decision, but much more remains to be investigated and tested. In addition, behavioral approaches beyond simply reframing the benefits could be applied to the problem of consumer consideration of life annuities. Both intertemporal choice and decision under uncertainty are crucial elements of the decumulation decision, and research in those domains is highly relevant to this area (e.g., Soman, 1998; Zauberman and Lynch, 2005; Shu, 2008). Work on consumer learning as well as social aspects of decisions may offer advice on how observations of other consumers' retirement outcomes influence an individual's annuity choices, a topic we will explore in greater depth below and a key contribution of this paper.

One factor that has thus far been neglected in research on retirement decision making is the role of affect. Individual levels of affect, which capture the positive and negative emotional content of the decision and its anticipated outcomes, are likely to be a major factor in predicting participants' decisions about converting savings to income (decumulation). Guaranteed income decisions are not only about the financial implications of the choices made, but also encompass concerns about providing for family, meeting retirement goals, and avoiding major risks such as poor health or running out of funds. Asking about life expectations may also generate an affective reaction in which negative emotions (anxiety, nervousness) or thoughts about dying result in an unwillingness to consider other important choices related to retirement. One possibility is that these affective reactions include heightened mortality salience (i.e., thoughts about death), which also affects the types of retirement goals considered during the decision process (Salisbury and Nenkov, 2016). To understand more about how this may affect claiming decisions, we next review findings from prior affective reaction and mortality salience research in the behavioral sciences.

The role of emotion in decision making

Models of human decision making now recognize that affect and emotion are important inputs, and make predictions for when positive or negative emotions will bias outcomes (Rottenstreich and Shu, 2004). In a decision, both the subjective value of the outcomes and the weighting of the outcome probabilities can be affected by emotional concerns. For example, valuation of outcomes can often be driven simply by gut emotional reactions of "how much do I like this?", an automatic judgment also known as an affect heuristic (Baron, 1992; Finucane, Alhakami, Slovic and Johnson, 2000). Because outcomes may be evaluated by their affective reaction, the traditional correlation between high risk and high reward can be violated, as people judge outcomes for which they have negative feelings (e.g., nuclear power) as high risk and low benefit while those for which they have positive feelings (e.g., cellular phones) are seen as high benefit but low risk.

The role of affect in consumer decision making has now been studied in a wide variety of consumer contexts, including in-store purchasing (Sherman, Mathur, and Smith, 1997), willingness to pay for consumer goods (Lerner, Small, and Loewenstein, 2004), and brand loyalty (Chaudhuri and Holbrook, 2001). However, little research has addressed the impact of affect in retirement decumulation decision making. Affect does not need to be directly related to the decision target to be a strong influence on choice. Affect-As-Information theory suggests that consumers use their transient emotions to make inferences about the positive and

negative trade-offs of a decision, even when the affect is actually only incidental, potentially leading to serious judgment errors (Schwartz, 2010). Consumers especially rely on information from affect compared to information from cognition when under high cognitive load (Shiv and Fedorikhin, 1999), which suggests that affect may play an especially outsized role in retirement decision making for less numerate consumers who may be more overwhelmed by the information load typically encountered for retirement choices. Better understanding the role of affect in retirement income decisions may allow us to better develop products that directly address affective concerns, as well as better communicate with plan participants about how insurance products or other decumulation options can align with their needs.

In this paper, we propose that the influence of affect in decisions that include feelings of loss, whether financial loss, loss of control over assets, or emotional loss due to loneliness and isolation in retirement, may be especially important for annuity decision making. While specific affective components have not yet been investigated, it has been documented that individual levels of measured loss aversion can be an important determinant of both annuity choice and early Social Security retirement benefit claiming (Shu and Payne, 2013; Shu, Zeithammer, and Payne, 2016). Since research on emotion has regularly found that high levels of affect increase feelings of loss aversion (e.g., Dhar and Wertenbroch, 2000; Luce, 1998; Luce, Bettman, and Payne, 1997; Luce, Payne, and Bettman, 1999), we may expect that stronger emotions within a decumulation decision, whether negative or positive, could also have an effect.

Beyond their effect on loss aversion, affective reactions have a wide variety of other impacts on decision making. Consumer decision making is often affected by positive or negative emotions, even when such emotions are not directly related to the target decision (Johnson and Tversky, 1983). Multiple negative emotions have been documented in purchase situations, including anger, disappointment, regret, worry, and sadness (Yi and Baumgartner, 2008; Lerner, Small, and Loewenstein, 2004). Affect has been found to impact cognition, and positive and negative affect impact it in different ways. For example, memory is improved for materials that match the affective state of the participant, such that sad participants recalled more from sad material and happy participants recalled more from happy material (Bower, 1981). There is strong evidence that negative affect reduces working memory (e.g., Brose, 2012; Levine and Burgess, 1997), including electrophysiological evidence (Figueira et al., 2017), and that positive affect improves working memory (Yang, Yang and Isen, 2013). Memory for negative information or events can also be reduced compared to memory for positive information or events because emotion suppression reduces memory for the experience that caused the suppression (Richards and Gross, 2005).

One source of negative emotion and anxiety within decumulation decisions may be the need to consider longevity expectations as an important input to the decision making. Whether explicitly asked by the issuer or implicitly considered by the consumer, thoughts about death and old age are obligatory. Research on affective reactions to mortality salience have been explored in work on charitable donations (Jonas et al., 2002; Fransen et al., 2008; Ferraro, Shiv, and Bettman, 2005), fairness (Jonas, Sullivan, and Greenberg, 2013), fitness intentions (Arndt, Schimel, and Goldenberg, 2003), and luxury purchasing (Mandel and Heine, 1999; Burke, Martens, and Faucher, 2010). Most relevant to the work presented here is a recent publication linking the annuity puzzle to feelings of mortality salience (Salisbury and Nenkov, 2016). These authors suggest that thinking about annuities primes mortality, even outside any other death-related context. They focus on the idea that in an attempt to avoid thinking about their mortality, potential annuity consumers simply avoid annuity products completely. They thus use the concept of mortality salience theory in its most basic form–that people get uncomfortable when thinking about death.

Taken together, the literature on affect in decision making suggests that negative emotions can encourage a focus on short-term gains, reduce cognitive processing and memory, and make potential losses feel more aversive, whereas positive emotions can encourage focus

on the long-term and increase cognition and working memory. Based on these findings, within the context of annuity decisions, we propose that individuals who are experiencing negative affect may be less interested in purchasing annuities and people experiencing positive affect may be more interested in them. Furthermore, we expect that anxiety and emotion can be generated by either messages about life in retirement, thoughts of socioeconomic status in retirement, or the effort required to manage financial resources in retirement, and we test all of these sources in our studies.

Use of social norms to change behavior

Many interventions are available to help individuals improve their decumulation decisions (for an overview, see Shu and Shu, 2018). For example, Kunreuther, Pauly, and McMorrow (2013, p. 142) suggest providing "better and more convincing information on the attractive properties of annuities" and their long-run cumulative payout as a solution to the annuity puzzle, an approach successfully tested in Shu, Zeithammer, and Payne (2016). As noted above, other interventions have reframed outcomes as losses or gains, or as benefits to investment or consumption (e.g., Brown, Kling, Mullainathan, and Wrobel, 2008). Relatively untested within the domain of decumulation, however, is the use of social norms, a behavioral intervention used with great success in other domains such as environment and health. Social norms, and specifically descriptive social norms, provide individuals with information about what other people do in a similar situation (Goldstein and Cialdini, 2007; Schultz, 1999). They serve as a highly successful persuasive appeal. The use of descriptive social norms to motivate behavior change is especially powerful in novel or ambiguous situations (Festinger, 1954), consistent with individuals' overall reliance on how others are behaving when deciding how to respond to an unknown situation (Milgram, Bickman, and Berkowitz, 1969; Sherif, 1936). Social norms are useful in such environments because it saves the individual time and effort in interpreting the situation and formulating a response; by mimicking what other individuals are already doing, the probability of a successfully effective outcome is increased. Normative messages have been used to encourage hotel guests to participate in an environmental conservation program (Goldstein, Cialdini, and Griskevicius, 2008), to reduce household energy usage (Schultz et al., 2007), to reduce binge drinking on college campuses (Agostinelli, Brown, and Miller, 1995), and to encourage doctors to prescribe less unnecessary antibiotics (Hallsworth et al., 2016).

Descriptive social norms may be especially effective in a retirement decision making context. Making significant choices about what financial avenues to pursue to be ready for retirement is often anxiety-provoking, with significant feelings of uncertainty about the best course of action. Both feelings of anxiety and uncertainty may result in people looking for outside advice and counsel. Information about what similar others are choosing to do is therefore likely to be especially impactful in this context. Additionally, because such decisions are typically only made once and rarely revisited, decumulation decisions are typically not decisions with which individuals have much experience. This lack of perceived expertise is also likely to encourage reliance on what similar others have chosen to do when that information is available.

Paper overview

The goals of this research were to better understand how affect and social norms impact purchase intentions of annuities. Based on pilot research, we predict that negative affect may lead to a focus on short-term gains and a reduced focus on long-term income streams. This suggests that individuals who are experiencing negative affect may be less interested in purchasing annuities, and, conversely, people with increased positive affect may be more likely to make such a purchase. We additionally predict that given the complex and infrequent nature of the retirement financial decision, social norms interventions that emphasize that many other people choose to purchase life annuities are likely to be particularly effective at encouraging annuity uptake.

We conducted four studies, one using real-world internet discussion board data and three studies using online panel participants. In Study 1, we scrape discussion board data from retirement discussion boards and analyze the incidence of words implying positive and

negative affect in the context of Social Security claiming, annuity purchase, 401(k) investment, pensions, and retirement in general. In Study 2, we examine how annuity messaging that attempts to generate either positive, negative, or neutral affect influences annuity purchase likelihood. In Study 3, we examine how affect and anxiety influence susceptibility to social norms messaging regarding annuity usage, and how this then affects annuity purchase intention. In Study 4, we examine how socioeconomic status impacts retirement decision making, and how this affect subsequently influences preferences for annuity products. Each of Studies 2-4 includes a pilot study with a study population from a diverse American sample of all ages and employment statuses, as well as a main study with a more targeted sample that was screened to include preretirement Americans age 40 to 62 who are currently employed. Together, these studies help us understand how affect and social norms impact retirement financial decision making, and specifically how they impact preference for annuities.

Study 1

In Study 1, we used Python to scrape data from internet retirement discussion boards hosted by AARP (formerly the American Association of Retired Persons). This allowed us to collect data about how people discuss retirement options in a naturalistic setting when they are having conversations with other individuals facing the same types of retirement choices. Specifically, we scraped all of the posts and replies in the "Money" section on the "Budgeting & Savings" and "Invest, Diversify, Integrate Your Financial Life" forums, and in the "Retirement" section we scraped all of the posts and replies on the "Retirement" and "Social Security" forums. We chose this as our data set as individuals posting on these forums seemed to be closer to making retirement financial decisions than users of other online discussion boards such as Reddit, who seem to be substantially younger. Additionally, anecdotal investigation identified the posts and comments on the AARP site as generally lengthier, on more topics relevant to near-retirees' personal finances, and better thought out than other available web forums on similar financial topics.

Methods

The data scraped from the AARP message boards resulted in 6,151 separate comments. The terms of interest were "retirement", "401(k)", "pension", "Social Security", and "annuity". Additional analysis of the stem "retire" with all possible endings (i.e., retiree, retire, retirement) was also performed but are not included here as they were very similar to the specific term "retirement". The Quanteda package for R was used to compile a single corpora from all four discussion boards that were scraped. The KWIC (key words in context) protocol was then used to identify the target words and text frames for ten words on each side of the target. The ten-word frame was chosen rather than analyzing the entire post because posts were often on varying topics, and we were specifically interested in the language used in relation to the chosen targets. Data was then analyzed for content and affect using the Linguistic Inquiry and Word Count Dictionary (LIWC).

Results

LIWC analysis provides the percentage of words in the target text that relate to various categories. Our results in this section should be considered summary statistics rather than tests of significance since we focus on percentages of particular terms, and those percentages are usually too low to allow standard approaches to testing significance. Nevertheless, these descriptive statistics offer some insights on how AARP message board participants think about various retirement issues. For each measure, we analyze how language about annuities differs from language about other retirement topics. In terms of basic content, out of the five targets (Social Security, 401(k), retirement, pension, and annuity), discussions of annuities had the smallest percentage of first person language (e.g., "I", "we"): 3.97% for annuities versus 4.34%, 6.57%, 5.15%, and 5.35% for the other targets respectively. This means that in the analyzed text related to annuities, 3.97% of the words in the text were related to the writer. This suggests that when considering annuities, there is less of an association with the self than when discussing other forms of retirement income.

There is some evidence that individuals considering annuities are differently concerned with their different risk/reward ratio than other forms of retirement income. As measured here, language around risk captures downside concerns or uncertainty about the income option, while reward captures positive benefits from the product. Products with more perceived risk relative to reward are likely to be less successful in the marketplace. For each target retirement topic, we calculate the percent of text about the risk concepts (downsides, uncertainty) relative to the percent of text about rewards concepts (benefits). The overall ratio for retirement as a target word was 0.77% of risk text versus 2.95% of reward text. This suggests that consumers are more focused on the rewards compared to the risks of all of these financial options, but further analysis of these ratios finds that the difference is more pronounced for some targets than for others. We find that the relative percentage of risk/reward language for 401(k)s was 0.9%/2.14%; for Social Security it was 1.18%/3.15%; for pensions it was 2.18%/2.33%; and for annuities it was 1.02%/1.53%. Thus, the perceived risks relative to the rewards are seen as quite high for annuities, second only to pensions.

Building upon mortality salience research for annuities (Salisbury and Nenkov, 2016), we explicitly investigated whether text related to death concerns was more prevalent for annuities. Concern around death was indeed more prevalent for annuities (0.26%) than 401(k)s (0.14%), Social Security (0.07%), pensions (0.06%) or retirement in general (0.11%). Interestingly, discussions of health did not show this trend, making up about as much content in discussions of annuities (0.64%) as pensions (0.61%) and retirement in general (0.67%), slightly less than Social Security (0.74%) and somewhat more than 401(k)s (0.48%). This suggests that one reason some individuals may be averse to considering annuities as an income option for retirement is at least in part due to discomfort with considering issues around mortality, and that these are more likely to arise in consideration of an annuity purchase. However, contrary to the mortality salience explanation, these concerns may not be directly connected to the individual's own chance of mortality (as reflected in no impact from health discussions), but could instead reflect overall feelings of fairness toward the structure of the life annuity product.

In contrast to the negative aspect of thinking about mortality, we wondered whether thinking about positive outcomes such as leisure in retirement may differ for annuity conversations. Our prediction was that contemplation of annuities was relatively unlikely to be associated with positive leisure thoughts. Fully 0.00% of discussions of annuities included language about leisure, while 0.14% of Social Security discussions, 0.08% of pension discussions, 0.29% of 401(k) discussions, and 0.44% of retirement discussions included such language. This suggests that annuities may be less likely to be associated with the positive aspects of retirement than other available financial products.

The overall use of affective language in annuity discussions was 2.81% of word usage. This was quite a bit lower than Social Security discussions (4.52%), pension discussions (4.35%) and retirement discussions (5.55%), but slightly higher than discussions of 401(k)s (2.71%). Looking specifically at emotional valance, positive emotions were less present in discussions of annuities (2.55%) than discussions of Social Security (3.80%), pensions (3.82%) or retirement (4.81%), but slightly higher than discussions of 401(k)s (2.14%). Negative emotions were actually less present in annuity discussions (0.26%) than any other target content: Social Security (0.63%), pensions (0.46%), retirement (0.69%) or 401(k)s (0.52%).

Together, these results suggest that consumers considering annuities engage in discussions of the products that are objectively different than the way in which they discuss the other common sources of retirement income: 410(k)s, pensions, and Social Security, and also from the way in which they discuss retirement in general. In particular, when discussing life annuities as a retirement income solution, individuals in the AARP forums were less likely to discuss themselves in relation to annuities, were more focused on risk relative to reward, were more concerned about death (but not health), and generally reflected less positive or negative emotion. These summary statistics provide us with a baseline understanding of how affect may

be incorporated into annuity decision making. In Studies 2-4, we turn to the use of targeted surveys with controlled emotional messaging to specifically investigate how differences in positive and negative affect impact preferences for annuities as a financial vehicle in retirement, as well as whether social norms manipulations are effective at increasing interest in the products.

Studies 2A and 2B

Studies 2-4 use participants ages 18-71 from Amazon Mechanical Turk for the pilot studies and participants ages 40-62 recruited from national panels provided by the data collection firm Qualtrics for the main studies. These survey panels, while convenience samples, provide a distribution of American adults whose demographics fit reasonably well with national averages. Participants are recruited and screened by the firms and are paid for their participation. During the studies, participants are further screened by relevant demographic variables (for example, by age) and according to their successful completion of an attention check. We find results from these surveys are similar to the Health and Retirement Study (HRS) data on key questions; for example, we found an average subjective probability of being alive at age 75 of 63.7% with a Qualtrics sample, while Elder (2007) reports an average subjective probability of being alive at age 75 of 65% among HRS respondents using a similar probability scale. While these panels are not as perfectly representative as panels provided by Knowledge Networks GfK panels, the panels provided by Qualtrics are quite close, and have an average cost per participant for a 20 minute study of approximately $6 compared to a GfK cost per participant of approximately five times that. Therefore, we believe that using Qualtrics panels provides the best balancing of participant representativeness and cost-effectiveness.

Studies 2A and 2B build on the findings of Study 1 and look specifically at how messaging designed to elicit positive and negative affect can influence preferences for annuities. In these studies, participants were randomized to view one of three retirement messages and associated images. Examples of the three retirement message conditions are provided in Figures 1a, 1b, and 1c. They then read additional messages, customized to condition, about how life annuities could address these concerns in retirement. The positive affect annuity message addressed how a guaranteed income stream can allow the participant to relax, have fun, and meet positive retirement goals; the negative affect annuity message addressed why an annuity is necessary to protect the participant from risks of running out of money and being impoverished in retirement; and the neutral affect annuity message was an informational message addressing how annuities work. Participants were then asked their interest in a lifetime annuity, completed the Positive and Negative Affect Scale (PANAS),[2] indicated the likelihood that they would live to various ages, and answered demographic questions (question text and response items for primary measures are provided in Appendix A). We hypothesized that messaging that induces negative affect will reduce interest in purchasing an annuity compared to the neutral and positive messaging, and that the messaging that induces positive affect will increase both engagement and interest in purchasing an annuity compared to the neutral and negative affect messaging.

Study 2A

Methods

For this pilot study, 301 participants were recruited from Amazon Mechanical Turk (MTurk), completed the study, and answered a simple attention-check question correctly. Participants' ages ranged from 18 to 69, with a mean of 35. Employment status varied, with many participants combining multiple part-time and gig jobs.

Results

A one-way ANOVA indicated no difference by affective message condition in interest in uptake of a life annuity, $p>.7$. Condition also did not impact perceived likelihood of living to any of the four ages given (65, 75, 85, or

[2] PANAS asks participants how much they are feeling each of ten positive emotions and ten negative emotions on five levels ranging from "very slightly or not at all" to "extremely" (Watson, Clark, and Tellegen, 1988).

95), all *ps* >.3. There was also no difference by condition in positive or negative affect as measured by the subsections of the PANAS, *ps*>.2, indicating that the differences in messaging were not effective at eliciting the expected affect for this study population. This suggests that the MTurk population is not amenable to being influenced by affect-laden retirement messaging. It is not clear whether this is an effect of the diverse ages of the sample or the complex financial lives of MTurk participants. MTurk studies typically pay on the order of $.10/minute or about $6/hour, and while MTurk participants have diverse household incomes, they appear to be more likely than the general population to be financially stressed. It therefore may be that the manipulations present in this study were not emotionally strong or temporally relevant enough to overwhelm the participants' previously existing feelings about retirement and retirement planning.

Because of this, we chose to look at the relationship between individual affect and interest in annuities using individual variation in emotion toward retirement and without regard to experimental condition. A linear regression analysis was performed that included negative PANAS score, positive PANAS score, age, gender, education, household income, self-reported health, and chance of living to be 85[3] as independent variables, and interest in purchasing a life annuity as the dependent variable. This analysis found only current age, likelihood of living to age 85, and positive PANAS to be significant predictors of interest in annuity purchase. Age was negatively related to life annuity interest, with younger individuals being more interested in the product, standardized β = -.240, t(295)=4.31, p<.001, a robust result found in prior research (Schreiber and Weber, 2016). As would be expected, predicted likelihood of living to age 85 was positively related to life annuity interest, β = 1.92, t(295)=3.05, p=.003. Interestingly, positive affect as measured by the positive subsection of the PANAS was also positively related to interest in annuity purchase, β = .284, t(295)=4.92, p<.001.

These results suggest that while the MTurk participant sample may not have been influenced by the retirement messaging manipulations we tested, affect does play a role in interest in annuity uptake. While our prediction that the advertisement designed to elicit positive affect would increase interest in the annuity product was not supported, these results provide evidence that positive affect itself is associated with greater interest in annuities as retirement financial vehicles. In Study 2B, we move on to a sample of participants more representative of the population likely to be in a position to seriously consider the purchase of a lifetime annuity.

Study 2B

Methods

One thousand forty-two participants were recruited via Qualtrics panel, got a simple attention-check question correct, and completed the study. Recruited participants were between the ages of 40 and 62 (M=49.09) and were currently employed either full or part time. That is, they were not yet retired and thus were still thinking about retirement decision making for the future. As in Study 2A, participants were randomly assigned to view a positive, negative, or neutral affect-inducing message about retirement and then asked about their interest in purchasing an annuity. They then completed the PANAS, life expectancy and demographic questions as in the prior study.

Results

Participants who read the negative affect-inducing retirement information were marginally less likely to indicate interest in purchasing a life annuity than those who read the positive affect-inducing retirement message ($M_{negative}$=60.6 versus $M_{positive}$=64.3, t(1, 647)=1.81, p=.071). There was no significant difference in interest in purchasing a life annuity between participants who read negative versus neutral messaging, p>.5, or between those who read neutral versus positive messaging, p>.1. Table 1 provides the means of all relevant measures by condition.

[3] Chance of living to 85 was the age chosen for inclusion in the regression because life expectancy in the United States is around 79 years. Subjective life expectancies were collected for ages 65, 75, 85, and 95 using a 0-100 likelihood scale, as shown in Appendix A.

Interestingly, the three retirement information conditions did not have a significant impact on positive affect, as measured using the positive portion of the PANAS scale, p>.8. However, there was a significant impact on negative affect with the negative portion of the PANAS scale, F(2, 1026)=7.49, p=.001. Contrasts indicate significant differences in negative affect between the positive (M=1.55) and negative (M=1.78) conditions t(1, 647)=3.96, p<.001, and the positive (M=1.55) and neutral (M=1.69) conditions, t(1, 697) = 2.46, p=.014, but not between the negative and neutral conditions, p=.131. This suggests that our manipulations did trigger negative affect, but also that negative affect is relatively high even when individuals are exposed to neutral information about retirement.

Participants who read retirement information designed to elicit positive emotions reported a higher likelihood of living longer than participants in the neutral or negative conditions, at all four life expectation ages tested (65, 75, 85, 95). This difference was marginal for age 65, F(2, 1031)=2.63, p=.072, and age 75, F(2, 1031)=2.91, p=.055, and significantly different for age 85, F(2, 1031)=4.42, p=.012, and age 95, F(2, 1031)=4.31, p=.014. This is a previously undocumented result in the research on life expectations and suggests that highlighting positive aspects of retirement could lead to higher overall life expectations, perhaps due to motivated reasoning or wishful thinking.

Financial planning for retirement is often an emotionally fraught process, and it is possible that participants were bringing strong emotions to these questions that were only somewhat influenced by the provided retirement information. Therefore, we next looked at the relationship between affect and interest in purchase of a lifetime annuity without respect to the condition that the participant was in. As shown in Table 2, a linear regression analysis that included negative PANAS score, positive PANAS score, age, gender, education, household income, self-reported health, and chance of living to be 85 as independent variables and interest in purchasing a life annuity as the dependent variable found only age, positive PANAS, and negative PANAS to be significant predictors. Age was negatively related to life annuity interest, with younger individuals being more interested in the product, standardized β = -.114, t(1004)=3.46, p<.001. Interestingly, both positive and negative affect positively predicted interest in annuity uptake, although the impact of positive affect was larger. Positive affect: standardized β = .398, t(1004)=13.12, p<.001, negative affect: β = .073, t(1004)=2.45, p=.014. It is specifically interesting to note that predicted likelihood of living to age 85 did not significantly predict interest in life annuity purchase (p>.4) when included in this regression model. Specific mediation analysis also indicated that life expectation does not mediate the positive affect–annuity uptake relationship, 95% Confidence Interval [-.7699, 0.232].

These results suggest that it is possible to impact affect related to retirement decision making of potential annuitants; however, many consumers are likely bringing significant emotions around the retirement decision to the process, and thus our ability to move these emotions may be somewhat limited. It was somewhat surprising that our affective messaging was so ineffective, a result that could have implications for how much impact marketing messages might have on influencing consumers' decumulation decisions. Furthermore, the PANAS measures suggest that the default emotional reaction to retirement, even when exposed to a neutral message, appears to be primarily negative. Positive messaging does appear to impact life expectations. The full regression analyses suggest that individual levels of positive affect again appear to be an important and significant predictor of interest in annuity purchase, as does negative affect, albeit to a lesser degree.

Studies 3A and 3B

In the above Studies 2A and 2B, we examined the impact of messaging designed to elicit positive, negative, and neutral affect about retirement on life annuity uptake decisions. We found only a marginal impact of the experimental manipulations, although we did uncover an intriguing impact of individual levels of affect on interest in purchasing a life annuity. In Studies 3A and 3B, we examine a different messaging manipulation–one that focuses on anxiety. For many people, financial planning for retirement is not just an emotional experience but is

specifically an experience that provokes anxiety around the significant future uncertainty that will be faced in retirement, including issues such as whether they will have enough money, whether they will be a burden to children and other loved ones, and whether they will be able to cover potentially significant healthcare costs.

In these studies, we also add a potentially significant intervention for increasing interest in annuities–social norms. Research has shown that correcting incorrect ideas about social norms (e.g., the percentage of students on a college campus who engage in binge drinking) can have a large impact on behavior (Agostinelli, Brown, and Miller, 1995). Norms have been shown to be especially effective in changing behavior under conditions of anxiety. Social norms have been found to impact a wide variety of decision making behaviors; however, to our knowledge, no one has yet investigated their potential impact on preferences for income streams in retirement. Similar to Studies 2A and 2B, we first pilot our interventions on a broad American sample using Amazon Mechanical Turk, then move to a sample that is more representative of individuals likely to be making decisions about life annuities.

Study 3A

Study 3A examines the impact of retirement messaging designed to either evoke high or low levels of anxiety around retirement financial decision making. It also investigates whether social norms manipulations can be effective in the context of life annuities.

Methods

One hundred and ninety-eight participants were recruited via Amazon Mechanical Turk (MTurk), completed the study, and answered a simple attention-check question correctly. Participant ages ranged from 19 to 71 years, with a mean of 35.6 years. Each participant was randomized to condition in a 2 (high or low anxiety messaging) x 2 (high or low social norms) crossed design with both factors manipulated between subjects. The social norms intervention focused on the number of other retirees who purchase life annuities in the United States, described either as a number (high norm) or as a percentage (low norm). To reinforce the strength of the intervention's message about the size of the life annuity market, participants were asked to indicate on a slider the number of other annuity purchasers. For the high norm condition, the range on the slider was set such that the correct response was on the high end (i.e., 80,000 out of a top value of 100,000). For the low norm condition, the slider was designed such that the correct response was on the low end (i.e., 3% out of 100%). The anxiety messages are shown in Figures 2a and 2b, and the social norms manipulations are shown in Figures 3a and 3b. Each participant saw one retirement message and one social norms message. Participants were then asked to indicate their level of interest in purchasing a life annuity, the age at which they were planning to begin collecting Social Security retirement benefits, and completed the PANAS and various demographic and retirement-related questions as in prior studies.

Results

There was no impact of either the anxiety messaging or social norms framing on positive or negative affect, and no interaction, all $ps>.2$. There was no impact of social norms on longevity expectations, all $ps>.3$; however, there was significant impact of messaging anxiety content on predicted likelihood of living to age 85, with individuals in the high anxiety condition predicting reduced likelihood of survival to that age (M=48.6% vs. 56.8%) F(3, 194)=4.39, $p=.032$, and a similar effect for predicted likelihood of living to age 95 (M=28.5% vs. 39.1%) F(3, 194)=6.90, $p=.009$.

While the anxiety messaging manipulation did appear to have some impact on longevity predictions, it did not have a significant impact on interest in the purchase of a life annuity, $p>.6$. However, the social norms framing manipulation did have a significant impact on life annuity interest, with individuals who were in the higher social norms framing reporting significantly greater interest in the products (M=59.0 vs. M=48.7), F(3, 194)=6.81, $p=.010$. There was not a significant interaction between the manipulations of social norms and anxiety, $p>.4$. There was also no impact of anxiety messaging or social norms framing on planned Social Security retirement benefit claiming age, and no interaction, all $ps>.1$.

To further investigate the finding from Studies 2A and 2B that affect had an impact on interest in the purchase of a life annuity, we conducted a regression which included household income, health perception, age, gender, negative affect, positive affect, anxiety manipulation condition, social norms manipulation condition, and perceived likelihood of living to age 85 as independent variables and interest in a life annuity product as the dependent variable. Replicating the finding from Studies 2A and 2B, positive affect was a strong positive predictor of interest in a life annuity, β = .282, t(194)=3.88, p<.001. Negative affect, however, was not a significant predictor. The social norms manipulation continued to be a predictor of increased interest in the life annuity in this model, β =.162, t(194)=2.37, p=.019. Also replicating the finding in Studies 2A and 2B, current age was negatively associated with interest in a life annuity product, β = -.216, t(194)=3.14, p=.002. As would be expected by rational economic actors, probability of living to age 85 was positively associated with interest in a life annuity product, β = .205, t(194)=2.61, p=.010.

To see whether similar effects exist for Social Security benefits claiming, a decision with strong similarities to the annuity uptake decision, we also analyzed how these variables affected a question on predicted age for SSA claiming (response range from age 62 to age 70). A regression with the same independent variables as the above analysis and with planned age of Social Security retirement benefit claiming as the dependent variable showed only current household income as a marginal positive predictor of claiming age, β = .152, t(194)=1.92, p=.056, and negative affect as a negative predictor of claiming age, β = -.210, t(194)=2.84, p=.005. While SSA claiming decisions are not a primary focus of this project, these results do suggest that affective components of the claiming decision could be an interesting topic for future research.

Study 3B

Study 3B takes the interventions used in Study 3A to a population more similar to the population likely to be making decisions about financial vehicles for retirement. Specifically, Study 3B uses participants from ages 40 to 62 who are still employed at least part time.

Methods

One thousand, two hundred and eighty-nine participants were recruited via Qualtrics panel, completed the study, and correctly answered a simple attention-check question. Participants' ages ranged from 40 to 62 years, with a mean of 48.6 years. All participants were currently employed full or part time, thus were all still in a position to make retirement decisions as they had not yet retired. As in Study 3A, participants were randomized to one of four conditions in a 2 (high or low anxiety messaging) x 2 (high or low social norms) design, were asked to indicate their level of interest in purchasing a life annuity and the age at which they were planning to begin collecting Social Security retirement benefits, and completed the PANAS and various demographic and retirement-related questions.

Results

A 2x2 ANOVA revealed no effect of either the anxiety content of the retirement messaging conditions or the social norms conditions on positive affect, and no interaction, all ps>.3. Additionally there was no impact of messaging or norms on negative affect, ps>.3, although there was a marginally significant interaction, F(3, 1268)= 3.80, p=.052. Looking more closely, we find that the high social norms message increases negative affect in the low anxiety condition ($M_{lownorm}$=1.71 vs. $M_{highnorm}$=1.78) but the same message decreases negative affect in the high anxiety condition ($M_{lownorm}$ =1.75 vs. $M_{highnorm}$ =1.66). It is possible that the high social norms information gives consumers a perceived solution that is socially acceptable and relatively popular for mitigating high levels of anxiety, but more work will need to be done to replicate this effect and determine its robustness.

Anxiety content of the messaging did not have a significant impact on longevity expectations, with the exception of likelihood of living to 65, F(3, 1285)=4.82, p=.028, with individuals in the high anxiety condition reporting greater likelihood of living to age 65 (M=80.7% chance vs. 77.9% respectively). However, given that this effect was not found for the other ages (75, 85, 95), it seems relatively likely that this was simply statistical noise. Social norms messaging did not have any impact

on longevity estimates, all *ps*>.3, and there were no significant interactions, all *ps*>.3.

Social norms did, however, have a strong impact on interest in purchasing a life annuity, with individuals in the high social norms condition indicating increased interest in an annuity (M=61.87 vs. M=59.91), F(3, 1245)=14.40, p<.001. Anxiety messaging had no impact on interest in life annuity purchase, *p*>.3, and there was no interaction, *p*>.8. Anxiety messaging also did not impact planned Social Security retirement benefit claiming age, *p*>.9. There was also no impact of annuity social norms messaging on Social Security claiming, nor an interaction (*ps*>.4), although this was as expected since the norms message was specific to annuities.

As in Studies 2A and 2B, many of the participants were likely bringing well-formed feelings and anxieties about financial planning for retirement to this study, therefore potentially deadening the impact of the relatively short intervention. We thus decided again to look at how individual levels of affect directly impact interest in life annuity purchase. To do so, we ran a regression that included household income, health perception, age, gender, negative affect, positive affect, anxiety manipulation condition, social norms manipulation, and perceived likelihood of living to age 85 (see Table 3). Of these, health perception was surprisingly negatively related to annuity purchase interest (all reported betas are standardized betas), β = -.061, t(1228)=2.03, *p*=.043, suggesting that those in better perceived health are less interested in annuities, contrary to rational models. As would be predicted by rational economic models, however, predicted likelihood of living to age 85 (while controlling for health) significantly positively predicted life annuity interest, β = .084, t(1004)=2.87, *p*=.004. As in Study 2B, current age negatively predicted annuity interest, β = -.108, t(1004)=4.03, *p*<.001. Also as in Studies 2A and 2B, positive affect was a strong and significant positive predictor of life annuity interest, β= .320, t(1004)=11.44, *p*<.001. However, negative affect was not a significant predictor. Exposure to the higher social norms condition also positively predicted interest in life annuity uptake, β = .105, t(1004)=3.92, *p*<.001 in this model.

These results replicate the findings of Studies 2A and 2B that individual levels of positive affect are associated with greater interest in life annuity uptake. Again, our attempts to directly manipulate affect (via anxiety) using retirement messaging had minimal impact on actual felt levels of affect and anxiety; individual differences in existing affect were the more important and impactful aspect of annuity interest. Additionally, these results show that interest in life annuities is highly susceptible to social norms manipulations, with individuals exposed to social norms that make life annuities seem more common having significantly more interest in the products. This manipulation of social norms was accomplished by describing the number of current life annuity purchasers in absolute numbers rather than in population percentage terms. By letting individuals know what other retirees are doing, in an atmosphere of negative affect and high anxiety induced by retirement decision making, social norms offer a path out of the uncertainty.

Studies 4A and 4B

In Studies 4A and 4B, we investigate how socioeconomic status predicts interest in guaranteed retirement income streams. Previous work has proposed that individuals of lower socioeconomic status (SES) experience increased anxiety and negative affect when faced with economic transactions, such as visiting a banking center, due to a variety of factors including negative previous experiences with financial professionals. It is reasonable to believe that this anxiety and negative affect also surfaces when individuals are making choices about retirement income streams. In these studies, we also seek to replicate the effects in our prior studies of social norms messaging and positive affect on interest in annuity uptake.

Studies 4A and 4B are important complements but distinctly different from Studies 2 and 3, where our attempts to directly manipulate affect and anxiety via messaging had minimal effect on actual emotional reactions as measured through PANAS. One interpretation of our inability to directly manipulate affect is that existing individual levels of affect around retirement are a stronger driver of annuity interest than our manipulations; this is supported by the significant

role of measured positive affect on interest in life annuities in all of our analyses. Here, we take a different approach and explore heterogeneity in individual affect more thoroughly by looking at how it may correlate with SES. Finding an association between SES, negative and positive affect, and interest in annuities could point to marketplace approaches built around targeting particular populations rather than simply changing the messaging for all retirees.

Study 4A

Methods

Two hundred and ninety-eight participants were recruited using Amazon Mechanical Turk, completed the study, and correctly answered a simple attention-check question. The ages of participants ranged from 19 to 71 years old, with a mean of 36.2 years. Participants had a wide variety of employment statuses.

Participants were randomized to either the high social norms or low social norms for life annuities framing that was used in Studies 3A and 3B. They then indicated their interest in purchasing a life annuity, completed the PANAS, the Susceptibility to Interpersonal (Normative) Influence scale (Bearden, Netemeyer, & Teel, 1989), the Bureau of Financial Protection financial distress scale, and a variety of other attitude and demographic questions.[4]

Results

Social norms framing had a significant impact on interest in the life annuity product, with participants exposed to the high social norm framing expressing greater interest than those exposed to the lower social norm framing (M=59.7 vs. M=52.0), t(1,296)=2.41, p=.017. This result replicates the findings of Studies 3A and 3B that social norms can have a strong effect on interest in life annuities.

In the previous studies, individual levels of affect–especially positive affect–had a significant impact on interest in a lifetime annuity. To investigate that issue, in this study we conducted a regression with the independent variables used previously (household income, age, gender, positive affect, negative affect, and health perception) and included the additional variables measured for this study: financial distress (to capture SES), susceptibility to social influence, childhood financial well-being, and social norms framing. Financial distress was measured using the Bureau of Consumer Financial Protection's Financial Well-Being scale, and childhood financial well-being was measured using the proxy of asking participants "when you were growing up, how often did you feel you needed things that your family could not afford?"

In contrast to the previous findings, current age did not predict interest in the life annuity product, p>.2, and gender, which had not previously been a significant predictor, was now significant, with women expressing greater interest than men in the product, β = .225, t(295)=3.69, p<.001. Replicating our previous findings, positive affect was a positive predictor of interest in a life annuity, β = .251, t(295)=3.71, p<.001, and social norms framing continued to be a significant predictor in the model, β = .142, t(295)=2.52, p=.012. No other variables were significant predictors of interest in the life annuity. Analyzed in isolation, susceptibility to social influence was positively correlated with interest in a life annuity, r(297)=.136, p=.019; however, it was no longer significant when examined in the greater regression model, p>.5.

Study 4B

Methods

Two-thousand, one hundred and thirty-six participants were recruited from a Qualtrics panel, completed the study, and answered a simple attention-check question correctly. Participants' ages ranged from 40 to 62 years old, with a mean of 49.2 years. All participants were currently employed full or part time, meaning that they were all in the position to still be making financial decisions about retirement planning.

[4] See Appendix A for scales.

As in Study 4A, participants were randomized to either the high social norms or low social norms for life annuities framing. They then indicated their interest in purchasing a life annuity, completed the PANAS, the Susceptibility to Interpersonal (Normative) Influence scale (Bearden, Netemeyer, & Teel, 1989), the Bureau of Financial Protection financial distress scale, and a variety of other attitude and demographic questions.

Results

Social norms framing had a significant impact on interest in a life annuity, with those in the high social norms condition indicating significantly more interest than participants who saw the low social norms framing (M=61.7 vs. M=56.6), t(2103)=4.25, p<.001. The social norms manipulation had no impact on Social Security retirement benefit claiming preferences, p>.2. Social norms framing also did not have any impact on either positive or negative affect, ps>.3.

As in Study 4A, we examined the impact of affect on interest in a life annuity by conducting a regression with the independent variables used previously (household income, age, gender, positive affect, negative affect, and health perception) and included additional variables added for this study: financial distress, susceptibility to social influence, childhood financial well-being, and social norms framing (see Table 4). As in previous studies, age was a negative predictor of interest in a lifetime annuity, β = -.104, t(2059)=4.79, p<.001. Also replicating the previous studies, positive affect was a relatively strong predictor of interest in the life annuity product, β = .236, t(2059)=10.15, p<.001, and social norms condition continued to be predictive in this model, with participants who saw the high social norms manipulation expressing more interest in a life annuity than those in the low social norms condition β = .092, t(2059)=4.33, p<.001. Negative affect was not a predictor of annuity interest. Level of current financial distress was a positive predictor of interest in a life annuity, with individuals indicating more financial distress indicating higher interest, β = .115, t(2059)=4.11, p<.001. Childhood financial distress, however was a marginal negative predictor of interest, β = -.037, t(2059)=1.73, p=.084. Interestingly, susceptibility to social influence remained a predictor of interest, even with the social norms condition variable included in the model, indicating that individuals who are highly susceptible to the opinions of others were more likely to indicate interest in the product across both social norms conditions, β = .056, t(2059)=2.49, p=.013. This may simply be an indication of higher susceptibility to experimenter demand effects, but likely warrants further investigation. A mediation analysis using the social norms condition as the independent variable, interest in a life annuity as the dependent variable, and susceptibility to social influence as a potential moderator was not significant, providing some evidence for this explanation.

A somewhat surprising finding was that negative affect was a marginal positive predictor of interest in a life annuity, β = .044, t(2059)=1.75, p=.081, a result found only in Study 2B. It is unclear whether this is a relatively small effect that this larger sample was able to pick up, or whether the finding is simply noise; however, this suggests the issue warrants further exploration. It is possible that emotion in general is a positive predictor of interest in a life annuity, but that the effect for positive emotion is simply stronger than that of negative emotion.

Other indicators of financial well-being also provide evidence that higher levels of financial distress are related to increased interest in a life annuity product. Participants that reported currently being on some type of government financial assistance indicated more interest in a life annuity than those who were not receiving assistance (M=65.3 vs. M=58.4), t(1,2077)=3.38, p=.001. A variety of exploratory measures of financial distress and interest in being better off than those around them were positively correlated with interest in a life annuity, including liking to feel they have more money than those around them, r(2103)=.047, p=.031, feelings of not having enough money to buy all the things they want, r(2104)=.069, p=.001, and amount they would be proud to live in the nicest house on their block, r(2104)=.124, p<.001. Self-reported tendency to make impulse purchases was also strongly correlated with interest in a life annuity, r(2101)=.101, p<.001, indicating that some people may see such financial products as being valuable self-

control tools. Tendency to forgo things today to save for tomorrow was not correlated with interest in the annuity product, $p>.9$.

These results provide additional support for social norms interventions as an effective way to increase interest in life annuity products. They also provide further support for the hypothesis that individual levels of positive affect around retirement are positively associated with interest in annuities as financial vehicles for retirement. Additionally, these findings provide evidence that financially distressed individuals, as well as those who have a stronger desire to excel financially compared to those around them, are more likely to be interested in life annuity products. Individuals who self-identified as being more likely to make impulse purchases also indicated greater interest, suggesting that consumers may find the products appealing as self-control devices, an intriguing result that warrants additional research.

Conclusion

One of the most complex financial decisions individuals face is how to optimally consume saved assets during retirement. Individuals must trade off the risk of spending their retirement assets too quickly and running out of money against the constraints of spending too slowly and possibly dying without having spent the funds earmarked for retirement consumption, both issues fraught with uncertainty. One underutilized tool for solving this problem is a life annuity. By converting retirement assets into a lifetime income stream, annuities can eliminate the risk of outliving one's assets.

While a rational model of annuity decisions requires that buyers consider issues of preferred retirement age, return on personal assets, longevity risk, and expected age of death, both previous research and the studies reported here indicate that additional psychological influences can also have a large impact on the annuity decision. In particular, we focus on the role of affect (emotions) in retirement decumulation decisions, a relatively unexplored area of research. Across six experimental studies, we find that positive affect is consistently associated with greater interest in annuity uptake, and that this relationship cannot be explained by increased longevity estimates. Additionally, in two of the studies, negative affect is also associated with increased interest in annuities, suggesting that total level of affect may be a factor in annuity decision making.

For many people, the process of making significant financial decisions for retirement is stressful and leads to a variety of negative emotions. This is not surprising, as the process requires often complex financial calculations as well as consideration of one's own (and potentially one's spouse's) mortality. The finding that positive affect leads to increased interest in annuity uptake may help to explain the underutilization of life annuities as retirement financial vehicles. If the retirement planning process itself decreases positive affect, so might it thus decrease interest in life annuities. The current studies suggest that methods of reducing stress in the financial planning process may be a way to increase annuity uptake by increasing positive affect at the time the relevant decision is being made.

At the same time, our attempts at using messaging to directly highlight different emotional aspects of retirement were not entirely successful at increasing positive or negative affect among our study participants. While this is discouraging for anyone attempting to use positive or negative messages to influence annuity take-up, whether in research or advertising, it does suggest that a deeper understanding of individual differences and consumer heterogeneity could have substantial payoffs. Indeed, our analyses that use measured individual levels of positive and negative affect, rather than manipulated levels, consistently showed that individual positive affect was a highly significant predictor of interest in life annuities. Thus, the challenge may be less about delivering positive messages to retirees and more about targeting the retirees who are already feeling positive about retirement.

The significant stress associated with the retirement financial planning process may also help explain why social norms appear to be especially effective in the retirement decision making context. The significant feelings of uncertainty about the best course of action and the infrequency with which one is called on to make decumulation decisions may both lead consumers to

be especially influenced by what similar others have chosen. Across the four studies in which social norms were tested, all four provided strong evidence of the effectiveness of social norms framings on increasing interest in life annuities. Simply framing descriptive information about the number of American retirees who choose life annuities as to suggest it is a fairly popular (rather than fairly rare) choice increased interest by around 10%. Given that annuities are generally believed to be underutilized, simple social norms framings may be one simple, cost-effective way by which to increase the rate at which individuals are willing to seriously consider them as part of their long-term financial plan.

Studies 4A and 4B demonstrated that individuals with higher levels of financial distress showed greater interest in lifetime annuity products, as did those who reported higher levels of impulse spending and those who were more concerned with wealth status relative to their peers. It is interesting to note that these relationships held even when taking into account household income, so it is not simply an effect of lower-income individuals finding guaranteed income streams more attractive. These findings suggest novel potential avenues of exploration for encouraging annuity uptake, specifically communicating their benefits as long-term guarantors of status or self-control devices.

The current research provides some interesting suggestions of avenues of further research. The mechanism by which positive affect leads to increased interest in life annuities would be a fruitful area for additional exploration. Which factors make individuals particularly susceptible to social norms manipulations in the decumulation context could also be a productive line of inquiry. Why increased financial distress leads to increased interest in annuity uptake, especially given that positive affect also leads to increased interest, should also be explored.

The retirement financial decision-making process is a complex one. Lifetime annuities can provide a secure source of income in retirement without risk of the individual outliving their assets. While the reasons for the underutilization of such annuities are no doubt complex, the current work has uncovered some previously unexplored factors that influence consumer preferences for these financial instruments. Positive affect, high social norms framing, and financial distress all increase interest in the uptake of lifetime annuities. Interventions and messaging that make better use of these factors may be able to help consumers make long-term financial decisions better aligned with their retirement goals.

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Figure 1a. Positive affect annuity message for Studies 2A and 2B

Research shows that retirement can be a positive and enjoyable experience. Retirees often report many positive aspects of not working anymore:

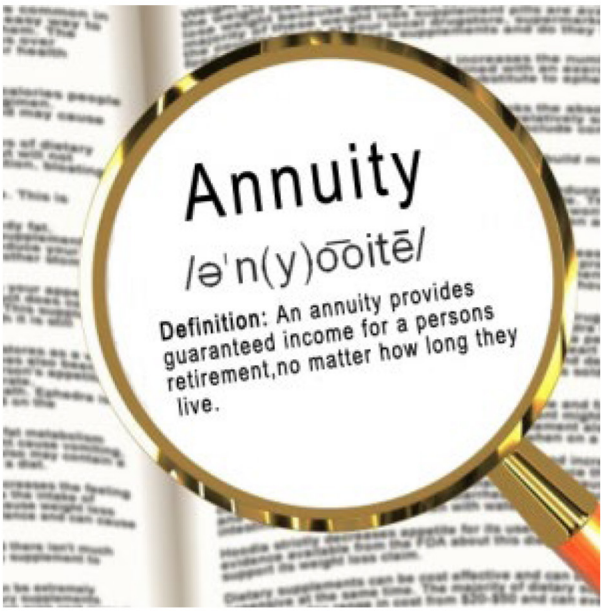
- **Your time is your own - no need to be out the door at a specific time every day!**
- **You can spend leisurely time with friends and family.**
- **You have more time to spend on yourself doing things like exercising and staying healthy.**
- **You can pursue new hobbies and projects that you didn't have time for while working.**
- **No need to keep up with the daily hassles of the job - you're less rushed and tired all the time.**
- **Being retired allows you to appreciate the wisdom and experiences you have generated over your lifetime.**

Figure 1b. Negative affect annuity message for Studies 2A and 2B

Research shows that retirement can be a sad and disappointing experience. Retirees often report many downsides of not working anymore:

- **Without a job to go to any more, it is easy to quickly become bored and feel like you are lacking identity and purpose in your life.**
- **You are likely to spend time being alone instead of being with friends and family, who have other responsibilities to fill their time.**
- **It can be harder to meet new people of your own age than it was when you were younger.**
- **You may be carrying large amounts of debt (like a mortgage) without a reliable source of income.**
- **Simple activities like getting dressed and walking around can get harder as you get older.**
- **You may find yourself stressed about major financial obligations like health costs and home maintenance.**

Figure 1c. Neutral affect annuity message for Studies 2A and 2B



An annuity is a retirement product that provides guaranteed retirement income for as long as you live. You pay a defined amount into the annuity and then draw a guaranteed income every month during your retirement.

Figure 2a. High anxiety message for Studies 3A and 3B

Planning for your financial life in retirement can be a complex process. It is often necessary to visit the Social Security Office, make appointments and meet with financial planners, accountants, and estate planners, and to visit local banking centers to meet with investment advisors. Dealing with all these financial professionals can be exhausting and requires that you find a lot of detailed information about past income, current savings, and future needs. As you go through this process, you will need to think carefully about whether the savings and income you have will be enough to last all of your years of retirement.

Figure 2b. Low anxiety message for Studies 3A and 3B

Planning for your financial life in retirement can be a complex process, but help is available! There are many websites that provide easy to follow advice that can help you plan, free online calculators that can easily help you make decisions, and often friends and family members have advice that can help you decide what path to take. Talking with these caring individuals allows you to get their input on how to best take advantage of your past income and current savings so that you are comfortable in retirement, and it can also be a fun way to collectively daydream about your future!

Figure 3a. High social norms manipulation for Studies 3 and 4

Every year, around 80,000 retirees in the United States use some of their retirement savings to buy immediate life annuities, which provide them with guaranteed monthly income for as long as they live.

Based on the information above, approximately how many retirees per year take advantage of immediate life annuities?

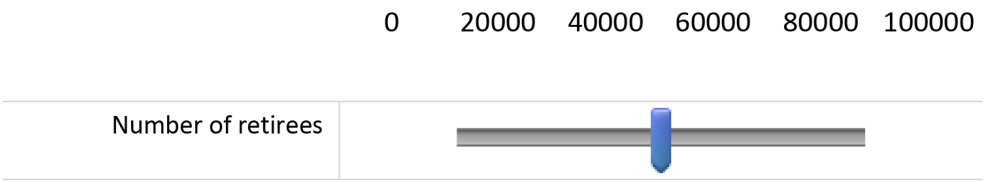


Figure 3b. Low social norms manipulation for Studies 3 and 4

Every year, only 3% of retirees in the United States use some of their retirement savings to buy immediate life annuities, which provide them with guaranteed monthly income for as long as they live.

Based on the information above, approximately how many retirees per year take advantage of immediate life annuities?

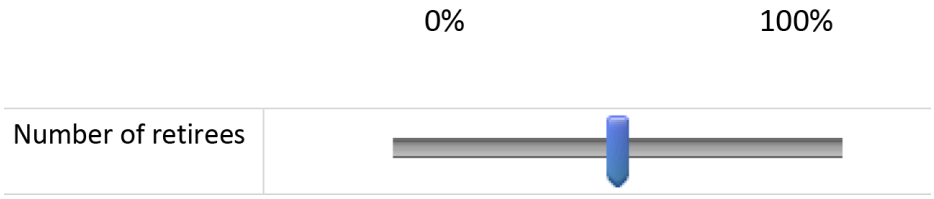


Table 1. Means per affect messaging condition, Study 2B

Condition	Likelihood for life annuity	Positive affect (PANAS)	Negative affect (PANAS)	Probability of living to 85
Positive affect	64.3	3.08	1.55	66.1
Negative affect	60.6	3.04	1.78	60.6
Neutral	61.8	3.04	1.69	60.8

Table 2. Regression results for Study 2B

	Unstandardized Beta	Std. Error	Standardized Beta
(Constant)	49.125	8.103	
PANAS Positive Mean	11.106***	.847	.398***
PANAS Negative Mean	2.472*	1.009	.073*
What is the highest level of schooling you have attended?	-.854	1.217	-.022
What is your age?	-.461***	.116	-.114***
The chance that I will live to be 85 years old or more is	-.023	.030	-.025
What is your approximate household income?	.166	.617	.008
How would you rate your overall health compared to people of your age?	-.585	.588	-.033
What is your gender?	1.732	1.587	.032

Notes: *** p<.001, ** p<.01, * p<.05. Dependent variable: probability of considering a life annuity measured on 0-100 scale.

Table 3. Regression results for Study 3B

	Unstandardized Beta	Std. Error	Standardized Beta
(Constant)	50.591	7.894	
What is your approximate household income?	-.079	.539	-.004
How would you rate your overall health compared to people of your age?	-1.152*	.567	-.061*
What is your age?	-.476***	.118	-.108***
PANAS Positive Mean	9.481***	.829	.320***
PANAS Negative Mean	-.218	.967	-.006
Anxiety Condition: Low/High	1.027	1.465	.019
Social Norms Condition: Low/High	5.745***	1.466	.105***
The chance that I will live to be 85 years old or more is	.082**	.028	.084**
What is your gender?	.355	1.583	.006

Notes: *** p<.001, ** p<.01, * p<.05. Dependent variable: probability of considering a life annuity measured on 0-100 scale.

Table 4. Regression results for Study 4B

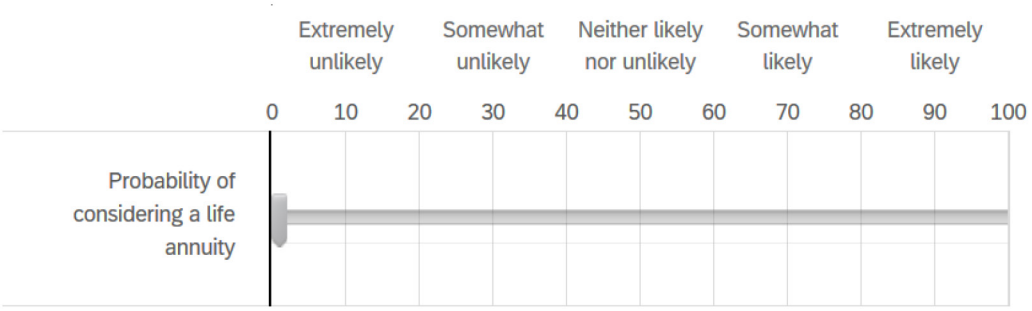
	Unstandardized Beta	Std. Error	Standardized Beta
(Constant)	36.419	7.708	
Social Norms Condition: Low/High	5.044***	1.164	.092***
CFPB Distress Measure	3.602***	.876	.115***
Influence Scale Mean	1.373*	.551	.056*
PANAS Positive Mean	7.252***	.715	.236***
PANAS Negative Mean	1.305	.747	.044
How would you rate your overall health compared to people of your age?	.470	.440	.024
When you were growing up, how often did you feel you needed things that your family could not afford?	-.116	.067	-.037
What is your approximate household income?	-.167	.528	-.007
What is your gender?	1.588	1.280	.027
What is your age?	-.449***	.094	-.104***

Notes: *** p<.001, ** p<.01, * p<.05. Dependent variable: probability of considering a life annuity measured on 0-100 scale.

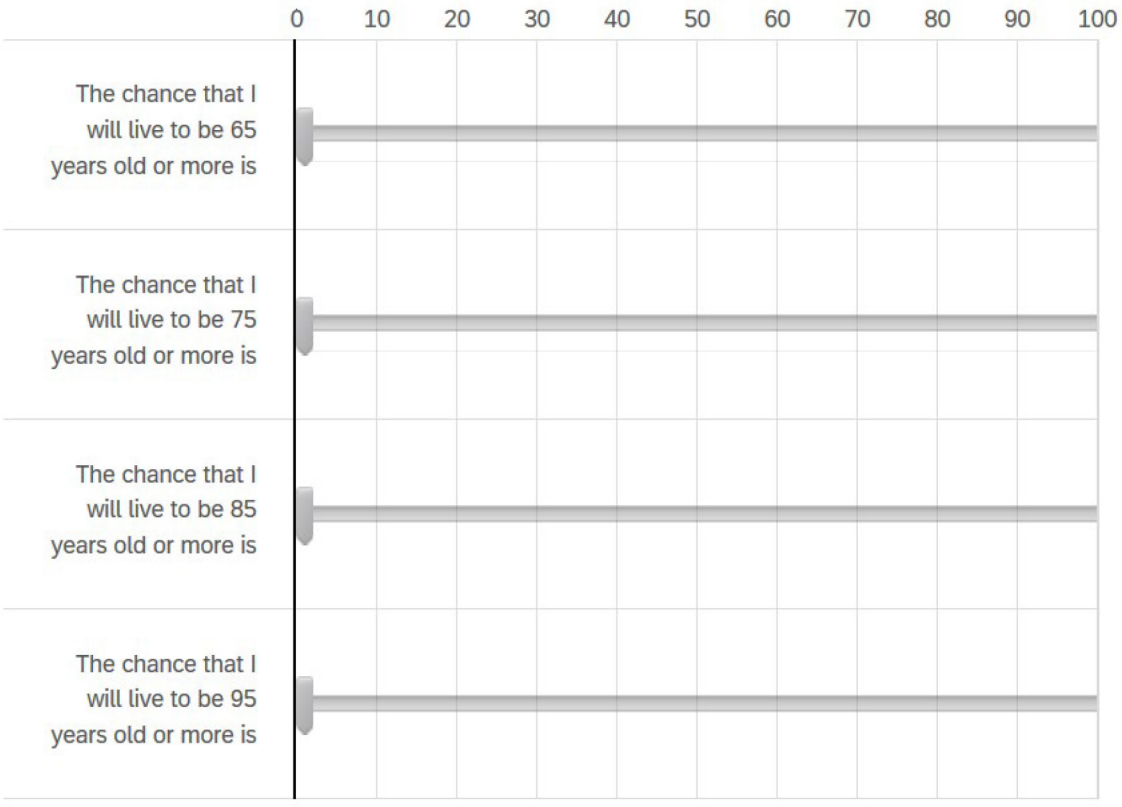
Appendix A. Question text and response scales for each study

Primary DV, interest in an annuity:

How likely would you be to consider buying a life annuity during retirement to provide guaranteed monthly income?



Subjective life expectations:



PANAS:

Please indicate to what extent you currently feel the following:

	Very slightly or not at all	A little	Moderately	Quite a bit	Extremely
Interested	○	○	○	○	○
Distressed	○	○	○	○	○
Excited	○	○	○	○	○
Upset	○	○	○	○	○
Strong	○	○	○	○	○
Guilty	○	○	○	○	○
Scared	○	○	○	○	○
Hostile	○	○	○	○	○
Enthusiastic	○	○	○	○	○
Proud	○	○	○	○	○
Irritable	○	○	○	○	○
Alert	○	○	○	○	○
Ashamed	○	○	○	○	○
Inspired	○	○	○	○	○
Nervous	○	○	○	○	○
Determined	○	○	○	○	○
Attentive	○	○	○	○	○
Jittery	○	○	○	○	○
Active	○	○	○	○	○
Afraid	○	○	○	○	○

Susceptibility to Interpersonal (Normative) Influence scale:

Please choose the appropriate answer to indicate whether you agree or disagree with each statement.

	Strongly Disagree	Disagree	Slightly Disagree	Neither Agree Nor Disagree	Slightly Agree	Agree	Strongly Agree
I often consult other people to help choose the best alternative available from a set of products	○	○	○	○	○	○	○
If I want to be like someone, I often try to buy the same brands that they buy.	○	○	○	○	○	○	○
It is important that others like the products and brands I buy.	○	○	○	○	○	○	○
To make sure I buy the right product, I often observe what others are buying and using.	○	○	○	○	○	○	○

	Strongly Disagree	Disagree	Slightly Disagree	Neither Agree Nor Disagree	Slightly Agree	Agree	Strongly Agree
I rarely purchase the latest fashion styles until I am sure my friends approve of them.	○	○	○	○	○	○	○
I often identify with other people by purchasing the same products and brands they purchase.	○	○	○	○	○	○	○
If I have little experience with a product, I often ask my friends about the product.	○	○	○	○	○	○	○
When buying products, I generally purchase those brands that I think others will approve of.	○	○	○	○	○	○	○

CFPB Financial Distress scale:

Please choose the appropriate answer to indicate how often you experience the following things:

	Never	Sometimes	About half the time	Most of the time	Always
I am jealous of the other people's wealth or possessions	○	○	○	○	○
I feel like I do not have enough money to do all the things I want	○	○	○	○	○
I like to feel that I have more money than those around me	○	○	○	○	○
I would be proud to live in the nicest house on my block	○	○	○	○	○

	Never	Sometimes	About half the time	Most of the time	Always
Worrying about money keeps me from sleeping well	○	○	○	○	○
I buy things I don't really need	○	○	○	○	○
I regret purchases after I have made them	○	○	○	○	○
I make purchases impulsively	○	○	○	○	○

	Never	Sometimes	About half the time	Most of the time	Always
I forgo things today to save for tomorrow	○	○	○	○	○
I like to have the latest clothes, tech gadgets, or cars	○	○	○	○	○
Seeing people with more money than me makes me feel bad about myself	○	○	○	○	○

About the authors

Helen Colby, Ph.D. is an Assistant Professor of Marketing at Indiana University's Kelley School of Business. Her research is in consumer financial decision making and health decision making. Among other things, Colby studies how people make decisions about saving and debt, how healthcare costs effect treatment choices, and how financial literacy training affects emotion, stress, and other psychological outcomes. Her work has been presented at numerous national and international conferences including the Association for Consumer Research, the Society for Judgement and Decision Making, and Behavioral Decision Research in Management, as well as published in highly-regarded journals including Psychological Science and the Journal of the American Medical Association. Colby received her Ph.D. in cognitive psychology and marketing from Rutgers University, where she also received her master's degree. She holds an undergraduate degree from the University of Chicago in economics and psychology.

Suzanne B. Shu is currently an Associate Professor of Marketing and Behavioral Decision Making at UCLA's Anderson School of Management whose research focuses on behavioral economics and marketing. As of July 2020, she will be the John Dyson Professor of Marketing at Cornell University's Dyson School of Applied Economics and Management within the Johnson College of Business. The types of decisions analyzed in her research include consumer self-control problems and consumption timing issues, with important implications for both negative behaviors (such as procrastination) and positive behaviors (such as saving). Her most recent work on financial decisions has focused specifically on decumultation during retirement (annuities, Social Security claiming) as well as on perceived fairness for financial products. Professor Shu received a Ph.D. from the University of Chicago in 2004, where she worked with behavioral economist Richard Thaler; she also holds a Bachelor of Science degree in Electrical Engineering and Masters in Electrical Engineering from Cornell University. Before arriving at UCLA, Professor Shu taught marketing and decision making courses to MBA students at the University of Chicago, Southern Methodist University, and INSEAD. She currently also is an NBER Faculty Research Fellow, holds a joint faculty appointment at the UCLA Medical School, and has been a visiting scholar for several years at the Consumer Financial Protection Bureau.