Solving the Annuity Puzzle: the Role of Mortality Salience in Retirement Savings Decumulation Decisions

Linda Salisbury, Boston College, USA
Gergana Nenkov, Boston College, USA

We propose a novel explanation for the annuity puzzle - that the annuity decision makes people’s mortality salient, evoking thoughts of death and motivating them to defend against this threatening awareness by avoiding the annuity option. Across four experiments, we demonstrate the negative effect of mortality salience on annuity preference.

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Consumer Financial Decision Making:
Understanding Savings Accumulation and Decumulation Decisions

Chairs: Gergana Y. Nenkov, Boston College, USA
Linda Court Salisbury, Boston College, USA

Paper #1: The Illusion of Wealth and Its Reversal
Dan Goldstein, Microsoft Research, USA
Hal Hershfield, UCLA, USA
Shlomo Benartzi, UCLA, USA

Paper #2: Solving the Annuity Puzzle: The Role of Mortality
Salience in Retirement Savings Decumulation Decisions
Linda Court Salisbury, Boston College, USA
Gergana Y. Nenkov, Boston College, USA

Paper #3: Psychological Factors in Savings and Decumulation Decisions
Suzanne Shu, UCLA, USA
John Payne, Duke University, USA

Min Zhao, University of Toronto, Canada
Dilip Soman, University of Toronto, Canada
Joonkyung Kim, University of Toronto, Canada

SESSION OVERVIEW

Reports abound in both academic and popular outlets on consumers’ inability to ensure a secure and timely retirement (e.g., Munnell et al. 2009; Osterland 2014). Two major problems contribute to this retirement crisis. First, there is a savings accumulation problem related to the decisions consumers make when it comes to accumulating sufficient savings to retire comfortably. For example, the typical U.S. working household approaching retirement in 2013 had accumulated only $111,000 in 401(k)/IRA balances (Munnell 2014). Second, there is a savings decumulation problem related to the complex decisions consumers reaching retirement age face of determining how and when to draw down retirement savings and pension benefits. Due to inadequate savings, ineffective financial planning, and increasing life expectancies, many consumers are expected to outlive their retirement savings. For example, the Employee Benefit Research Institute estimates that 43% of Americans in the lowest-income quartile are expected to run short of money during their first year of retirement; and by the tenth year, an estimated 72% of them will be in this predicament (VanDerhei 2014). Retirement savings decumulation decisions are just as vital as decisions related to savings accumulation, yet very little consumer psychology research has been conducted to understand these decisions.

The objective of this special session is to explore the psychology of savings accumulation and decumulation decisions and their underlying processes. The first three papers in the session focus on the topic of savings decumulation, while the fourth paper in the session address the topic of savings accumulation. The first paper (Goldstein, Hershfield, and Benartzi) investigates how information architecture affects consumers’ perceptions of wealth and intentions to save. Specifically, these authors examine whether people exhibit an “illusion of wealth” by which receiving a lump sum (e.g., $100,000) can be perceived as larger or smaller than its annuitized monthly income equivalent (e.g., $500 per month for life). The second paper (Salisbury and Nenkov) proposes that increased mortality salience while deciding whether to purchase an annuity may underlie the so-called annuity puzzle, leading consumers to avoid annuities as a savings decumulation strategy. The third paper (Shu and Payne) investigates the impact of life expectation judgment framing, loss aversion, intertemporal impatience, and perceived ownership on decumulation decisions, such as when to begin claiming one’s Social Security benefits. Finally, Zhao, Soman, and Kim focus on saving accumulation and examine how visual depiction of the (converging vs. diverging) flow between overall savings goals and multiple sub-goals can facilitate saving.

Together the papers in this session make important contributions to both theory and practice in financial decision-making, and savings accumulation and decumulation decision-making in particular. Further, this session embodies the 2015 ACR theme of Advancing Connections: it employs both controlled experiments and field studies and presents findings that offer both important theoretical contributions and useful practical implications for public policymakers, financial firms, and individual consumers. Given the growing size of the elderly population, these papers provide much needed insights into how to help consumers remain financially healthy and independent (Goldberg 2009; Yoon, Cole, and Lee 2009).

The Illusion of Wealth and Its Reversal

EXTENDED ABSTRACT

Research on choice architecture is now shaping policy around the world (Thaler and Sunstein 2008; Goldstein et al. 2008) touching on areas ranging from retirement economics (Benartzi and Thaler 2013), organ donation (Johnson and Goldstein 2003), end-of-life care (Halpern, Ubel, and Asch 2007), to environmental issues (Pichert and Katsikopoulos 2008). Recently, researchers and policy makers have started to pay more attention not just to choice architecture but also to information architecture: the format in which information is presented to people (Johnson et al. 2012). Research in information architecture has shown, for example, that the caloric content of food can be well appreciated in terms of the amount of exercise it would take to work calories off (Bleich and Rutkow 2013; Dowray et al. 2013), and the comprehension of cars’ energy efficiency can be enhanced by presenting information in terms of gallons per 100 miles instead of miles per gallon (Larrick and Soll 2008). This paper investigates information architecture, though instead of addressing the consumption of calories or gasoline, we focus on economic consumption in retirement.

A timely policy debate concerns the information provided to the owners of approximately 80 million 401k retirement accounts. We focus on the Department of Labor (DOL) proposal that 401k statements display the money’s worth of the account in terms of the projected lifetime income that the account can buy (Lifetime Income Disclosure Act 2011).

From a research perspective, our motivation is to investigate how people react to lump sums versus equivalent streams of monthly income. One question of interest is whether people exhibit an “illusion of wealth” by which a lump sum at retirement age (e.g., $100,000) seems larger than its monthly equivalent (e.g., $500 per month for life). We predict and test whether people exhibit the illusion of wealth as well as the opposite effect, by which lump sums seem smaller than their monthly equivalents.
We propose that the sensitivity to amounts of money is greater for monthly amounts than lump sums. We motivate this hypothesis using Decision by Sampling theory (Stewart, Chater, and Brown 2006), a relative of Range-Frequency Theory (Parducci 1965). This greater sensitivity to monthly amounts means that low monthly amounts are perceived as rather inadequate while high monthly amounts are perceived as rather adequate. In contrast, perceptions of lump sums change relatively little as the amount varies. This can lead to situations in which the two curves cross and monthly amounts are perceived as both less adequate and more adequate than lump sums, depending on the underlying amount. We show this in three experiments.

**Study 1**

A sample of 310 adults was recruited via Mechanical Turk (Mage = 28.37, SD = 10.21, Range 18-68, 40.3% women). We used a 2(Presentation: lump sum, annuity) x 7(Amount: $25,000, $50,000, $100,000, $200,000, $400,000, $800,000, $1,600,000) mixed design, with presentation as the between-subjects factor and amount as a within-subjects factor. In the lump sum condition, participants were asked to imagine that they would have a given lump sum to spend in retirement. In the annuity condition, however, participants were asked to imagine that they would have the equivalent monthly amount to spend in retirement. As predicted, people were less sensitive to changes in lump sums than to changes in monthly amounts. Also as predicted, monthly amounts were seen as clearly less adequate at low wealth levels, and clearly more adequate at high wealth levels. Models 2 and 3 in the appendix show that the predicted interaction between wealth amount and presentation format is significant.

**Study 2**

Study 2 replicates study 1 but with a between subjects design. A sample of 960 middle-aged respondents was recruited via a national survey panel (Mage = 53.70, SD = 5.28, Range 45-64, 52% women). To be eligible for participation, participants needed to have an annual household income between $40,000 and $150,000. Participants were then randomly assigned to one of eight conditions. We used a 2(Presentation: lump sum, annuity) x 4(Amount: $100,000, $200,000, $1,000,000, $2,000,000,000) between-subjects factorial design. As in Study 1, people were less sensitive to changes in lump sums than to changes in monthly amounts, and monthly amounts were seen as strongly less adequate at low wealth levels, and strongly more adequate at high wealth levels. Models 5 and 6 in the appendix show that the predicted interaction between wealth amount and presentation format is significant.

**Study 3**

Study 3 had the same sample size and levels as Study 1, but was run on a new set of participants and had intentions to save as a dependent measure instead of perceived adequacy. As predicted, there was less sensitivity to lump sums. Furthermore, as predicted, low monthly amounts increased saving intentions more than low lump sums, and the effect reversed at higher wealth levels. Regression coefficients are omitted for space, but the expected interaction is significant (p < .05).

In conclusion, Studies 1, 2 and 3 support the possibility of an illusion of wealth and its reversal at higher monetary amounts. For smaller amounts of money, we found that middle-aged adults felt that a lump sum would be more adequate for retirement than an equivalent monthly annuity. They were also less likely to want to increase their saving behavior when exposed to a lump sum rather than an annuitized amount. We predicted and found a reversal of this pattern for larger amounts of money, consistent with the view that people are more sensitive to amounts expressed as annuities, and less sensitive to lump sums, which they tend to assign intermediate ratings. Of social importance is the idea that the illusion of wealth might also contribute to the troubling tendency of Americans to claim their social security benefits at the earliest possible age and to cash out pensions.

**Solving the Annuity Puzzle: The Role of Mortality Salience in Retirement Savings Decumulation Decisions**

**EXTENDED ABSTRACT**

Consumers reaching retirement age face the difficult task of deciding how and when to spend the money they have saved for retirement. For five decades, economists have examined this savings decumulation problem and have argued that purchasing annuity products is an optimal decision strategy for most people when they reach retirement (Bernartzi et al. 2011; Yaari 1965). Economic theory argues that annuities mitigate the risk of outliving one’s income, but very few individuals choose to annuitize their retirement savings, a phenomenon economists refer to as the annuity puzzle. In March 2014, U.S. retirement assets totaled $23 trillion, with only 8.7% of that held as annuity reserves (Investment Company Institute).

The economic literature has examined the annuity puzzle within a rational choice framework. Several explanations for the annuity puzzle have been examined – such as low retirement savings (Dushi and Webb 2004), unfair annuity pricing (Mitchell et al. 2000), annuitization framing (Agnew et al. 2008; Brown et al. 2008), and desire to bequeath one’s assets (Lockwood 2012) – yet none have been shown to fully account for it. Further, companies have adjusted their annuity products to accommodate proposed explanations and make annuities more attractive by introducing options such as fixed terms, bequeath features, and deferred start dates, with little effect on annuitization rates. As a result, some researchers have called for more work that moves beyond the fully rational paradigm and instead offers behavioral explanations for the annuity puzzle (Brown 2007). This research offers one such novel explanation. We propose that the task of choosing whether to buy an annuity evokes thoughts of death. We argue that, by forcing people to consider how long they have left to live, the annuity decision makes people’s mortality salient, motivating them to escape the threatening awareness of their mortality by avoiding this option and choosing to self-manage their money instead.

Mortality salience (MS), defined as the increased accessibility of thoughts related to one’s death, has been examined extensively by terror management theory researchers, who have shown that people defend against conscious death-related thoughts by using proximal cognitive strategies that remove these thoughts from consciousness and/or push the problem of death into the distant future (Pyszczynski et al. 1999). Drawing upon this literature, we argue that consumers avoid annuity products as a proximal defense strategy against experiencing thoughts of death evoked by the annuity choice task. To test this proposition, we conduct four experiments and a meta-analysis of our studies to estimate an overall average effect size.

In Experiment 1, we asked 161 participants to imagine they are age 65 and deciding whether to put their retirement savings into an annuity product (annuity condition) or into an IRA product (IRA condition). Spontaneous thought listing during each task revealed that the annuity decision evoked significantly more thoughts about death and dying than did the IRA decision ($z = 5.57, p < .001$), and purchase likelihood was far lower for the annuity (38.6%) than for the IRA product (63.4%; $z = 5.50, p < .001$).
In Experiment 2, we presented a hypothetical retirement scenario to 267 participants from an online panel and asked them to choose between a life annuity and self-managing their retirement savings at age 65. Participants were randomly assigned to a mortality salience or a control condition. We manipulated mortality salience using a well-established priming technique that asks participants to write about their own death (Burke et al. 2010; Greenberg et al. 2003; Greenberg et al. 1997). Participants in the control condition wrote essays about dental pain instead. As expected, participants were less likely to choose the annuity option when mortality salience was primed (M = 20.69%) versus when it was not (M = 31.79%; χ²(1,267) = 4.41, p < .05).

In Experiment 3 (n = 469), we tested a more subtle and practical MS manipulation by altering the annuity product description to make mortality more or less salient. A binary logistic regression analysis revealed that increasing mortality salience via either MS priming (M_{diff} = -9.44%, z = -2.31, p < .05) or altering the annuity description (M_{diff} = -10.31%, z = -2.63, p < .01) decreased the proportion of people choosing the annuity option, replicating our prior results.

In Experiment 4, we added a fixed-term annuity with a bequest feature to the choice set and again replicated our findings with a sample of 314 older consumers closer to retirement age, demonstrating the robustness of the mortality salience effect. Results from a 2 (mortality salience: low/high) X 2 (choice set: with/without fixed-term option) between-subjects design indicated a significant negative effect of increasing mortality salience (z = -2.01, p = .044) and a significant positive effect of including a fixed-term annuity option in the choice set (z = 1.94, p = .052). Specifically, increasing mortality salience decreased the proportion of people choosing either annuity option (M_{diff} = -10.19%, z = -2.01, p = .044), while adding a bequeathable fixed-term annuity increased the percent choosing an annuity (M_{diff} = 9.83%, z = 1.94, p = .052). Further, the bequeathable fixed-term annuity appears to be shifting choice share amongst annuity products when mortality salience increases.

Finally, we conducted a meta-analysis to integrate findings across Experiments 2-4 and estimated that the overall mean effect of increasing mortality salience was an 11.2% point decline in annuity choice rate (see figure in appendix for meta-analysis results).

This research contributes to understanding the annuity puzzle by moving beyond prevalent economic explanations and instead offering a novel psychological explanation. It also adds to terror management theory (Greenberg et al. 1997), which has linked mortality salience to a broad range of behaviors (e.g., Arndt et al. 2004; Cai and Wyer 2014), but has not examined its effects on financial decisions like retirement savings. Finally, it contributes to retirement planning research and practice by providing insight into retirement savings decumulation – an increasingly important topic as 401(k) plans replace traditional defined benefit pensions and the size of the elderly population grows.

**Psychological Factors in Savings and Decumulation Decisions**

**EXTENDED ABSTRACT**

Every day, 10,000 Americans reach age 65 and face one of the most expensive journeys of their life: retirement. As the largest source of retirement income for most Americans, the age at which to claim Social Security benefits is one of the most important financial decisions that they will ever make. Given substantial longevity risks and the financial benefits from delaying claiming, it has been suggested that later claiming should generally be chosen for most people (Shoven and Slavov 2012). Unfortunately, people may not be making the wisest decisions about when to start claiming: most Americans start collecting at age 62, and eighty percent or more claim their benefits before the normal retirement age of 66. The studies reported here seek to better understand decumulation decisions, including Social Security claiming, by manipulating framing of life expectations judgments as well as by measuring individual differences in loss aversion, intertemporal patience, and perceived ownership.

The decision to delay claiming of Social Security benefits involves evaluating a complex option with multiple uncertain outcomes occurring over time. Recent work has documented the effects of question framing on individuals’ judgments of their own life expectations, finding that asking questions in a “live to” frame rather than a “die by” frame can lead to an approximately ten year difference in predicted life expectation (Payne et al. 2013). Because life expectation is a key input to the claiming decision, it is important to understand how this type of question framing influences predicted claiming age. Another key psychological influence on claiming decisions is an individual’s measure of loss aversion, due to the perspective that not claiming early may result in a loss of benefits relative to a break-even calculation or one’s own contributions into Social Security. We also predict that affective reactions such as perceived ownership (“I deserve the payments I contributed over my working life”) can also be a strong driver of Social Security claiming decisions. Finally, since the claiming decision has implications that last for decades, individual measures of intertemporal patience should also predict whether individuals claim early or late.

We completed four online studies using national panels of over 4000 pre-retirement adults aged 35 to 65. Our first study focuses on the effects of life expectations judgments and loss aversion on a set of four retirement decisions including Social Security claiming. Studies 2 and 3 focus exclusively on the claiming decision, and show the effects of life expectations, loss aversion, perceived ownership, and intertemporal patience. Finally, in Study 4, we test whether using a “live to” or “die by” frame affects hypothetical retirement decisions by shifting attention to different aspects of the decision.

Study 1 is an online study of U.S. residents aged 35 to 65 (N = 832, 48.7% female) who were recruited and run online through internet panel company Survey Sampling International. We expose some participants to either a “live to” or “die by” frame prior to making a series of hypothetical retirement decisions to see how their life expectations judgments affect those later decisions. Specifically, participants were asked to estimate and report the chance that they would live to [die by] a certain age or older [younger] using a slider scale for the ages 65, 75, 85, and 95. As a control, other participants make the life expectation judgments after answering the retirement decisions. We collected four separate dependent variables, all of which capture whether the individual is being myopic about retirement income decisions. We also collect substantial additional information about each participant to use as covariates in our analysis, including age, gender, savings, social security solvency, life expectancy, loss aversion, subjective health, and numeracy. We find that subjective life expectancies are positively related to intentions to purchase a life annuity and to delay claiming of Social Security. This positive relationship is much stronger when the life expectancies are asked in a live-to frame rather than a die-by frame.

In Studies 2 (N = 1432, 49.8% female, aged 35-65) and 3 (N = 1113, 49.7% female, aged 40-65), we use only the “live to” frame and again manipulate whether judgments are collected before or after the claiming decisions. For participants who answer the live-to questions prior to claiming decisions, there is a significant and persistent effect of subjective life expectation judgments on predicted claiming age. Individual measures of loss aversion, perceived ownership,
solvency, and intertemporal patience are all significant predictors of intentions for early versus late Social Security claiming. Importantly, all of these individual difference measures operate independently of each other, suggesting that they can each contribute to the effectiveness of models of claiming behavior.

Finally, in Study 4 (N = 831, 49% female, aged 40 to 62), participants were randomly assigned to one of four conditions manipulating how claiming information was presented as well as whether life expectations were in a “live to” versus a “die by” frame. We again find that individual measures of life expectancy, loss aversion, perceived ownership, and intertemporal patience all significantly predict intentions for early versus late claiming. We also find a significant interaction effect: participants who think about their probabilities of living to older ages and then see an information table presented in a way that better highlights the benefits of later claiming indicate claiming ages delayed by around 5 months. Furthermore, life expectations are a more strongly significant predictor of claiming age for participants in the live-to framing condition. Individuals in the live-to frame appear to be more appropriately using their own predicted life expectancies, while those in the die-by frame are not integrating them in the same way. This may suggest something like an “ostrich effect” in which thoughts about dying result in an unwillingness to consider important choices related to retirement. One implication is that researchers hoping to gather behavioral measures that fully reflect respondents’ true subjective life expectations should be careful to use live-to framing (as in Studies 2 and 3). The choice of frame for life expectation information can be an important factor for helping individuals make retirement decisions.

Visual Depiction of Goal Structure and Financial Decisions

EXTENDED ABSTRACT

Helping consumers save has never been more important. Previous research has proposed different strategies to help consumers save such as the use of decision point (Cheema and Soman 2008), emphasizing goal specificity (Ülkümen and Cheema 2011), or earmarking on spending and saving (Soman and Cheema 2011; Thaler 1999). Recent research has also shown that focusing on one single savings goal increases saving compared with focusing on multiple savings goals (Soman and Zhao 2011). Given how common it is for consumers to have multiple goals for saving (e.g., saving for multiple purposes), we aim to explore how the visual depiction of the flow between overall financial goals and multiple sub-goals will facilitate saving.

We draw on the “fit” literature to develop our hypothesis. According to this literature, fit between external stimuli and consumers’ internal mindset creates fluency and enhances goal pursuit or persuasiveness (Higgens 2000; Kim, Rao and Lee 2009; Zhao, Dahl and Hoeffler 2014). More directly related to the current research, recent work has shown that orienting a product toward consumers’ dominant hand in visual ad enhances fluency in product visualization and increases purchase intention (Elder and Krishna 2011). Drawing on these findings, we propose that visual depiction of the flow between overall financial goal and its sub-goals can facilitate goal pursuit when it creates a fit. Specifically, for saving which is an act of collecting, converging flow from multiple sub-goals to the overall savings goal creates a fit and increases saving compared with diverging flow from overall savings goal to multiple sub-goals. On the contrary, for donation, which is an act of giving out, this effect will reverse such that diverging flow leads to greater donation compared with converging flow. Four studies test our hypotheses.

In Study 1A which was a field study in India, we provided local workers an opportunity to join a new savings program and randomly assigned participants in five conditions. Participants in the three single-goal conditions were told to save more as it would help finance their children’s education, finance any healthcare needs they might have, or provide a nest-egg for when they retire, respectively. In the other two conditions, participants were reminded of all of these three sub-goals and were provided with a visual display of these goals. In the converging condition, the visual flow went from three sub-goals to the overall savings goal, whereas in the diverging condition, the visual flow went from the overall savings goal to the three sub-goals. Participants were asked to indicate their intention to join the savings program. The results showed a significant difference in percentage of people indicating intention to join the program (M single/children’s education = 82% vs. M single/healthcare = 71% vs. M single/retirement = 72% vs. M multiple/diverging = 36% vs. M multiple/converging = 75%, χ2(4) = 42.52, p < .001). Consistently with Soman and Zhao (2011), we found that single goals led to greater intention to save than multiple goals. However, this effect was attenuated when the flow in the multiple-goal condition was converging. In Study 1B which was another field study in India, we replicated the effect of converging flow in terms of people’s self-reported saving six months after receiving the visual display of the flow between overall savings goal and multiple sub-goals (M converging = $20.44 vs. M diverging = $28.30, F(1,74) = 17.74, p < .001).

In Study 2, which was a lab study, we seek to explore the underlying process. Participants were asked to imagine a scenario where they were thinking about joining a savings program. After introducing the savings program, the financial advisor reminded participants of their future financial wellbeing such as children’s education, future housing or retirement savings, and sketched the goal structure in either a converging (flow going from multiple savings goals and overall financial well-being) or diverging flow (reversed flow). After indicating their intention to join the program, participants were also asked to rate to what extent it felt right, good, pleasant and important to join this program. The results showed that converging flow indeed increased participants intention to join the savings program (M converging = 8.31 vs. M diverging = 7.15; F(1,63) = 4.19, p < .05), and made participants feel more “right” to join the program (M converging = 8.90 vs. M diverging = 7.95; F(1,61) = 5.16, p < .05). More importantly, feeling-right mediated the effect of visual flow in goal structure on savings intention.

In Study 3, we test whether the effect of converging flow on goal pursuit such as saving will be reversed for other financial decisions such as donation which is an act of giving out. In this study, participants were provided with an opportunity to make a donation with the $2 that they received earlier in the study session. In both conditions, they could donate to either Daily Bread, Micro Skills or Habitat of Humanity, but the flow between overall goal of donation and the three sub-goals was either displayed in a converging (flow going from three organizations to overall donation goal) or diverging fashion (flow going from overall donation goal to three organizations). As a result, we found that participants in the diverging condition donated significantly more money than those in the converging condition (M diverging = $1.49 vs. M converging = $1.01; F(1,48) = 3.96, p = .05).

Taken together, these findings supported our hypotheses that visual flow in a financial goal structure can create a fit and facilitate goal pursuit. Specifically, converging flow enhances saving whereas diverging flow enhances donation because each type of flow is consistent with the goal act itself (collecting for saving vs. giving out for donating). This research contributes to prior work on financial decision making (Soman and Cheema 2011; Soman and Zhao 2011;
Thaler 1999) by providing a novel strategy to encourage consumer saving and donation. It also adds to the fit literature (Higgens 2000) and nudging research (Thaler and Sunstein 2008) by showing the impact of subtle contextual cues on fluency and financial decisions.

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