Adding and Subtracting: Decision Making During Accumulation and Decumulation of Retirement Savings

Paper 1: Making the Future Self More Vivid to Increase Retirement Saving
Hal Ersner-Hershfield* (*Kellogg School of Management at Northwestern University*) and Dan G. Goldstein (*Yahoo! Research and London Business School*)

Paper 2: Live to or Die by: Framing Effects on Life Expectations and Life Annuity Choice
Namika Sagara* (*Duke University*), John W. Payne (*Duke University*), Suzanne B. Shu (*UCLA*), Kirstin C. Appelt (*Columbia University*), and Eric J. Johnson (*Columbia University*)

Paper 3: Options, Not Returns: Overcoming the Annuity Paradox
Kirstin C. Appelt* (*Columbia University*) and Eric J. Johnson (*Columbia University*)

Discussant: Building Connections in Retirement Decision Making
John G. Lynch* (*University of Colorado, Boulder*)

Session Chair: Kirstin C. Appelt (*Columbia University*)

Each presenter (indicated by asterisk) has agreed to participate in this symposium. None of the papers have been accepted for publication: the first paper is under review and the second two papers are in preparation – data collection and analysis are complete and the papers are currently being written.

Adding and Subtracting: Decision Making During Accumulation and Decumulation of Retirement Savings

Session Proposal

      Within the next decade, 31 million Americans will retire (Reno and Lavery 2009). On average, they will spend 20 years in retirement (National Commission on Fiscal Responsibility and Reform 2010). At the same time, the retirement landscape is changing as defined-benefit retirement plans (the employer pays a specified monthly benefit for the duration of retirement) are replaced by defined-contribution retirement plans (the employer contributes a specified amount to the employee's retirement account, but the employee is responsible for managing the account himself) (Brown, 2000). As a result, consumers are increasingly in charge of funding their own retirement and deciding how to manage their resources, at a time when their retirement is lasting longer than ever before.

      Retirement decision making has two crucial phases: the accumulation of wealth approaching retirement *and* the decumulation of wealth during retirement. Evidence suggests both that many Americans do not save enough for retirement (EBRI 2010; NIA 2007; Thaler and Benartzi 2004) and that almost half of Americans are concerned that they will not be able to maintain a reasonable standard of living during retirement (Society of Actuaries 2010). However, although consumers face challenges during both accumulation and decumulation, most research has focused on the accumulation phase. This session gathers leaders in the area of consumer finance to address *both* phases of retirement decision making.

This session connects these two phases by tracing retirement decision making from accumulation through decumulation. First, Ersner-Hershfield and Goldstein discuss insufficient saving for retirement during the working years. They offer a new avenue for increasing retirement savings: Data from three studies indicate that increasing the vividness of the future self can motivate the current self to save more money for retirement.

Next, Sagara et al. focus on the importance of life expectancy for accumulation and decumulation decisions. To determine how much to save for retirement and how to spend during retirement, consumers need to estimate how long they will live. Most economic models, such as the life-cycle model (Skinner 2007), assume that consumers have rational expectations of their own life expectancy. Sagara and colleagues suggest that this may not be the case and that, instead, life expectancy is a constructed estimate that depends crucially on question framing. Data from three studies show that consumers give longer life expectancies when asked about living to a certain age (vs. dying by a certain age), and that framing affects decumulation preferences.

The third paper investigates decumulation decisions in an uncertain world. Retirees have a finite amount of retirement savings, but they do not know how they will live and how long those savings must last. They are therefore faced with a large degree of longevity risk—the risk that they will outlive their assets. Annuities, which provide guaranteed lifetime income, offer a solution to longevity risk, yet few Americans purchase them. Appelt and Johnson investigate the "annuity puzzle" (Yaari 1965) from two perspectives: potential annuity features that may overcome consumers' reluctance to annuitize and individual differences that may affect annuitization. Data from two studies suggest that consumers prefer annuities that guarantee a specified number of payments (period certain annuities) or liquidity in case of emergencies (annuities with cash-back options) and that time and risk preferences moderate these effects.

Taken together, these three papers connect the accumulation and decumulation phases of retirement wealth. Because this is a developing area, we have asked John Lynch to lead the discussion. As an expert in the field of consumer finance, John will be instrumental in encouraging the building of connections. John will discuss the connections between accumulation and decumulation, with an emphasis on the contributions of the three papers to that discussion. John will also discuss how behavioral consumer finance generally and retirement decision making specifically can serve as nodes connecting different research areas as well as research and public policy. We have allotted 15 minutes for the discussion.

The recent economic crises indicate both the importance of consumer finance and the importance of behavioral factors within consumer finance. Furthermore, in the last two years, the government has shown significant interest in behavioral consumer finance with the establishment of the Consumer Financial Protection Bureau, a series of Senate committee hearings on retirement decision making, and a series of meetings about behavioral consumer finance issues in Washington, D.C. This session, which highlights new research from behavioral consumer finance, specifically retirement decision making, is well-timed and potentially influential. Given the relevance of the findings to research and public policy, we expect a broad audience, including researchers interested in consumer finance, preference construction, intertemporal choice, and framing; individuals interested in retirement issues; and policy makers.

Making the Future Self More Vivid to Increase Retirement Saving

Hal Ersner-Hershfield* (*Kellogg School of Management at Northwestern University*) and Dan G. Goldstein (*Yahoo! Research and London Business School*)

Short Abstract
We examine how a weak connection to the future self can lead to a focus on spending in the present rather than saving for retirement. We demonstrate that when people feel more connected to a vividly imagined future self, they are more motivated to save money in a long-term domain.

Short abstract word count: 50 / 40-50

Extended Abstract
        The number of years that the average American will spend in retirement is at an all-time high (Lee 2001), as life expectancy at age 65 has increased to 18 years (Arias 2007). Most Americans risk outliving their retirement savings. Furthermore, despite a recent small increase in saving rates, retirement experts estimate that 43% Americans will still be unable to maintain pre-retirement standards of living in retirement (due in part to the recent reduction in home values) (Bernheim et al. 2000; Munnell, Webb, and Golub-Sass 2009). In short, people are living longer but saving less.
        Under-saving is sometimes attributed to "myopia" or excessive discounting of the future. The inability to vividly imagine one's wants and desires at a distant age could account for some of the empirically observed discounting phenomena. As expressed by Parfit (1971), the failure to give adequate weight to the future might be "caused by some failure of imagination, or some false belief. It is claimed, for example, that when we imagine pains in the further future, we imagine them less vividly, or believe confusedly that they will somehow be less real, or less painful" (p. 161). Loewenstein (1996) has noted that a more vivid impression of ourselves engaging in some action in the future might intensify the emotions that are linked to thinking about that scenario. These intensified emotions might, in turn, allow an individual to be better informed regarding the future consequences of a current decision. For example, pulmonologists tend to smoke less than other doctors, in part because seeing blackened and withered lungs on a daily basis increases the negative emotions that are associated with smoking (Loewenstein 1996).
        Thus, to the extent that people can feel more connected to a vividly imagined future self, they should be motivated to save money in a long-term domain. Accordingly, we conducted three experiments to examine the association between a vivid perception of one's self in the future and the propensity to save more for retirement. In Studies 1 and 2, a novel technology, immersive virtual reality (VR), was developed to make one's perception of one's future self more realistic. In study 1, a control group of college undergraduates ($n = 25$) entered an immersive VR environment and saw a digital representation of their current selves in a virtual mirror, while the experimental group of college undergraduates ($n = 25$) saw an age-morphed version of their future selves in the virtual mirror. Upon exiting the VR environment, all participants were given a hypothetical money allocation task, among other tasks. The experimental condition participants were significantly more likely to allocate money toward a hypothetical retirement savings account ($M = \$178.10$) than control participants ($M = \$73.90$).
        In study 2, we sought to rule out two alternative explanations for our findings from study 1. First, because the monetary allocation task occurred directly after the virtual reality paradigm,

it is possible that participants in the experimental condition felt pressure to allocate more to the long-term account. Thus, in study 2, we separated the virtual reality portion of the study from the decision-making portion, and provided a cover story that masked our research purposes. Secondly, it is possible that experimental condition participants in study 1 were merely primed with the concept of aging, and this prime prompted them to save more for retirement (i.e., Bargh and Chartrand 1999). As such, in study 2, we exposed participants to either their own aged avatar or another research participant's aged avatar, and did so after a lengthy experimental delay. Results indicated that participants in the future self condition demonstrated significantly more patience on financial decision-making tasks ($M = .30$) than did participants in the future other condition ($M = -.27$).

  Although these findings are encouraging, there are several unresolved issues. First, this approach to virtual reality is expensive and time-consuming for participants, and most companies or banks will not be able to utilize immersive virtual reality to convince their employees or customers to adopt a longer-term perspective when making decisions about retirement savings. Secondly, experimental condition participants in Studies 1 and 2 were simply shown a neutral image of their future selves. Loewenstein's (1996) work suggests that in order to make a true connection to the future self, the future emotional consequences of current decisions must be made clear. Indeed, previous research has demonstrated that exposure to virtual cause-and-effect actions can change actual behavior. For example, compared to a control group, when participants were shown a virtual version of themselves gaining weight, they were more likely to go to the gym (Fox and Bailenson 2008). Accordingly, study 3 used a more accessible format to address the cause-and-effect nature of retirement decision-making.

  Namely, we used a web-based study design in which all participants were shown a slider bar that they could move to make allocations from a hypothetical paycheck to a hypothetical retirement account. As they moved the slider bar toward future consumption, their annual take-home pay decreased (indicated in today's dollars), but their annual retirement income increased (again, indicated in today's dollars). In the current self condition, however, participants were shown the monetary amounts as well as an image of their current self, which changed emotional expression as a function of the allocations that they chose to make (sadder as more money was allocated toward future consumption, happier as more money was allocated toward present consumption). In the future self condition, participants were shown the monetary amounts as well as an image of their future self, which changed emotional expression as a function of the allocations that they chose to make (happier as more money was allocated future consumption, sadder as more money was allocated toward present consumption). Again, results indicated that participants in the future self condition allocated a significantly higher percentage of pay toward retirement ($M = 6.76\%$) than did participants in the current self condition ($M = 5.20\%$). Results will be discussed in the context of Parfit's (1971) and Loewenstein's (1996) work.

Extended abstract word count: 989 / 750-1,000

Live to or Die by: Framing Effects on Life Expectations and Life Annuity Choice
Namika Sagara* (*Duke University*), John W. Payne (*Duke University*), Suzanne B. Shu (*UCLA*),
Kirstin C. Appelt (*Columbia University*), and Eric J. Johnson (*Columbia University*)

Short Abstract
Three large-scale studies demonstrate that subjective life expectancy can be a constructed
response that will reflect seemingly irrelevant task factors (question framings) and valid self-
knowledge. The framing effect was partially mediated by positive thoughts of being alive at a
certain age. Life expectancy and framing influenced preferences towards annuitization.

Short abstract word count: 49 / 40-50

Extended Abstract
        How long do you expect to live? Answering this question is essential to making informed
judgments and choices about savings, decumulation of retirement wealth, health, and many other
decisions. Yaari (1965), for instance, begins his classic article on life-annuity choice by saying
that "one need hardly be reminded that a consumer who makes plans for the future, must, in one
way or another, take account of the fact that he does not know how long he will live (p.137)."
Most lifetime consumption models assume that individuals take into account their probability of
living to different ages when planning how to decumulate their assets during retirement. The
importance of getting these estimates correct has become greater in recent years as employers
have shifted from offering defined benefit plans, which provided income regardless of how long
an individual lived, to offering defined contribution plans, under which the individual is solely
responsible for ensuring that he does not run out of savings during his lifetime.
        We address the issue of life expectancy and its effects on decumulation decisions through
three large-scale studies. Our research questions include understanding how individuals'
judgments about their life expectation probabilities may change according to how the question is
framed, how these judgments are affected by the knowledge individuals have about themselves,
and how these judgments affect preferences for life annuity products. We predict that beliefs
about how long one might live are, like preferences, often constructed responses that will reflect
seemingly irrelevant task factors (and biases) as well as valid knowledge (truth) and random
error. As a result, simple changes in how questions are worded can produce substantial biases in
both judgments and preferences.
        In three online studies (total n = 2,172), two different frames were used to elicit
individuals' probabilities for life expectancy for ages 65, 75, 85 and 95. Specifically, in one
condition, respondents were asked to provide probabilities of *living to* a certain age or older,
while in the other condition, they were asked to provide probabilities of *dying by* a certain age or
younger. Note that the answers to these two approaches should perfectly mirror each other if
framing has no effect. Following this subjective probability task, respondents in study 2 were
asked to either indicate their purchase probability for a single life annuity or their allocation of
retirement assets between the annuity and a self-management option. In study 3, respondents
used a type-aloud protocol to report their thoughts as they considered the probability of living to
[dying by] 85 years old or older [younger]. Respondents in study 3 later coded each of their own
previously-listed thoughts as emphasizing life, death, or neither, and being positive, negative, or
neither.

The results from all three studies consistently indicate that question framing strongly affects both judgments and preferences. For comparison purposes, all probabilities were converted to "live to" numbers (i.e., responses to "die by" questions were subtracted from 100%). An analysis of each respondent's data to determine the elevation and slope of each probability line per respondent allowed measurement of how framing and individual differences affect the line. The coefficient for framing was significant and large for both elevation and slope, while age, health, and gender also had significant effects. Respondents asked the question framed as a "live to" prediction provided higher probabilities across all age ranges than those asked the question framed as "die by". For example, in study 1, individuals in the live-to frame thought they had about a 55% chance of being alive at age 85, whereas individuals in the die-by frame thought they had about a 32% chance. There was also a ten-year gap in median expected age of death (85 years for the live-to frame and 75 years for the die-by frame).

Does the effect of framing on probability judgments for life expectancy also affect preference for annuities? The answer is yes. Likelihood of annuity purchase was significantly affected by average predicted life expectancy as well as by framing, and self-reported health. Allocation to annuities showed weaker effects, but was still significantly affected by life expectations, health, and age. Individual difference measures for numeracy, confidence in investment ability, and importance of making money last also had significant effects on preference.

Study 3 tested whether Query Theory (Johnson, Häubl, and Keinan 2007), which suggests that framing affects responses by changing the order in which individuals consider thoughts about the various choice options, explains the effect of frame on life expectancy. We found that the framing effect for age 85 was significantly partially mediated by the relative number of thoughts in favor of being alive at age 85. As predicted, individuals had more thoughts in favor of being alive at age 85 when presented with the live-to frame (vs. the die-by frame) and this partially mediated the effect of frame on the subjective probability of being alive at age 85.

The results of these studies demonstrate that both judgments and preferences about important future events, such as how to decumulate retirement assets, are sensitive to framing effects. Although there have been many framing studies (see Keren 2011 for an overview), the vast majority have involved evaluations of objects or preferences between options. In contrast, these studies ask how framing affects a prediction question. Consistent with explanations for other framing effects, different ways of posing the same question appear to direct attentional resources to different attributes, which results in different responses (Keren 2011). In fact, our mediation analysis suggests that respondents had more positive thoughts about being alive at 85 years old in the "live-to" condition than in the "die-by" condition, and this in turn, predicted subjective probabilities of being alive at age 85. Individual differences in age and health, which could be considered private information, also affected these predictions. Thus, it seems that judgments of an important future event, for which individuals should have both private and public information, may be "constructed" in the sense that judgments are subject to predictable biases, such as how the event is framed.

Extended abstract word count: 996 / 750-1,000

Options, Not Returns: Overcoming the Annuity Paradox

Kirstin C. Appelt* (*Columbia University*) and Eric J. Johnson (*Columbia University*)

Short Abstract
Although annuities insure people against outliving their money, few Americans purchase them. Two studies show that consumers prefer annuities that make less economic sense (annuities with a guaranteed minimum term or cash-back options), even if they give up returns. Individual differences in time and risk preferences also predict annuity preferences.

Short abstract word count: 50 / 40-50

Extended Abstract

When they retire, consumers are faced with decisions about managing their saving and spending, ideally providing themselves a comfortable standard of living for as long as they live. Using a limited amount of retirement savings, they must fund a retirement of unknown but potentially long duration. This presents consumers with the very real possibility that they will outlive their savings, an outcome called "longevity risk" by economists.

A life annuity is an "insurance product that allows an individual to convert a lump-sum of wealth into a stream of income that is guaranteed to last for as long as an individual (and if desired, his or her spouse) lives" (Brown 2011). Thus, an annuity is a potentially attractive solution for dealing with longevity risk. Not only does an annuity offer guaranteed lifetime income, it also typically provides a higher income than otherwise possible because the assets of those who die early subsidize the payments to those who die late (Brown 2000). Despite the economic attractiveness of annuities, few Americans choose to annuitize any of their retirement savings, a phenomenon termed the "annuity puzzle" (Yaari 1965).

In contrast to the standard life-cycle model used to analyze retirement savings and spending in economics (Skinner 2007), we suggest a behavioral model that posits relatively narrow framing, loss aversion, and quasi-hyperbolic discounting. The model suggests that annuities are unattractive for at least two reasons: First, decision-makers are loss averse and risk averse to the possibility of "losing" their retirement savings to the annuity company should they die early. Second, they discount, perhaps too much, the income stream provided by the annuity. Thus, loss aversion, risk aversion, and discounting are barriers to buying annuities. We examine the implications of this model using two strategies. First, we ask whether features designed to overcome these barriers to annuitization will be attractive to consumers. Specifically, we contrast the appeal of a standard economic feature (a higher rate of return) and two behavioral features (a guaranteed minimum term and available liquidity). Second, we ask whether individual differences in time and risk preferences, numerical ability (i.e., numeracy), and financial literacy explain annuity preferences and moderate the effects of annuity features on preference.

We conducted two web-based studies (total $n = 1,416$) using community samples of Americans aged 45 to 70 who had faced or would soon be facing retirement decisions. Participants read information about advantages and disadvantages of two options for decumulating retirement wealth: annuities and self-managed accounts. They were then presented with a general annuity followed by a series of four annuities with different features in a fractional factorial design: (1) return: low (5%) or high (7%); (2) period certain: a guaranteed minimum term of 15 years (i.e., if the annuitant dies within 15 years of purchasing the annuity, the annuitant's heirs would receive the remaining years of payments) or no guaranteed minimum

term; and (3) available liquidity: a cash-back option (i.e., the annuitant or the annuitant's heirs can withdraw the balance of the annuity as a lump sum at any time) or no cash-back option. For each annuity, participants were asked how likely they would be to purchase the annuity. In study 2, participants also completed measures of time and risk preferences as well as numeracy and financial literacy, allowing for tests of individual differences.

In study 1, consistent with the annuity puzzle, participants reported being unlikely to purchase the base annuity—an annuity offering a 5% return and no period certain or cash-back option. However this differed significantly as the features of the annuity changed: Participants were significantly more likely to purchase annuities offering either a guaranteed minimum term or a cash-back option. Interestingly, participants were insensitive to the rate of return on the annuity, equivalent to $2,000 a year on a $100,000 annuity. In other words, participants were attracted to annuities with behavioral features designed to minimize risk aversion and loss aversion, but not to an annuity offering a standard economic incentive.

In study 2, we replicated the findings from study 1 and additionally tested the impact of individual differences in preferences and abilities. For a general annuity, as predicted, participants who were present-biased were less likely to annuitize. Participants who were risk averse were marginally more likely to annuitize, which is to be expected since annuities reduce the risk of longevity. Neither numeracy nor financial literacy predicted annuity preference. Numeracy did, however, moderate the effect of rate of return such that highly numerate participants preferred the high-return annuity to the low-return annuity more than those who were low in numeracy. Impatience moderated the effect of the period certain feature and the cash-back feature such that impatient participants preferred these options marginally more than patient participants. Risk aversion moderated the effect of the period certain feature such that risk-averse participants preferred the period certain feature more risk-seeking participants. In other words, the attractiveness of the economic incentive was moderated by numerical ability whereas the attractiveness of the behavioral features was moderated by time and/or risk preferences. Notably, financial literacy did not predict preference for annuitization or any annuity features.

These results support a more behavioral model of retirement decision making. As hypothesized by Brown (2000) and Hu and Scott (2007), retirees may be insensitive to standard economic incentives for increasing annuitization. Participants did not show a preference for an increased rate of return. Instead, they were drawn to annuities offering a guaranteed minimum term or available liquidity. This pattern of results suggests that retirees are most concerned with ensuring that, should they die early, their money does not remain with the insurance company and with having access to their money. Additionally, we find that likelihood of annuitization is driven by time and risk preferences rather than financial literacy or numeracy. These results suggest that financial education may not be sufficient to solve the annuity puzzle. Instead, to encourage annuitization, it may be better to appeal to consumers' time and risk preferences by designing annuity products that address these preferences.

Extended abstract word count: 992 / 750-1,000

Discussant: Building Connections in Retirement Decision Making
John G. Lynch* (*University of Colorado, Boulder*)