Lifetime Individual Retirement Arrangements: An Application of Thaler and Sunstein's *NUDGE*

John B. Mitchell
Central Michigan University

Alinde J. Moore
Ashland University

This paper reviews principles of behavioral finance as applicable to retirement withdrawal planning, discusses common retirement planning problems, reviews relevant law, and proposes an application of Thaler and Sunstein's NUDGE (2008). The paper includes a proposal for modification of U.S. federal retirement plan law to encourage behavior which will lead to reduced risk of ruin for retirees and concludes with the implications for retirees, the federal government, and financial institution.

INTRODUCTION

Current projections are for the Social Security Trust Fund (OASI) to be exhausted by 2037 with tax revenue equal to only 76% of expected benefits at that time (Employee Benefit Research Institute, 2009). Meanwhile, the use of defined-benefit retirement plans is declining (Copeland, 2009). Never in the past 70 years has there been more reason to encourage workers to provide for their own retirement.

As human beings we experience difficulty in making rational decisions in complex situations. Retirement planning, in particular, is filled with opportunities for irrational choices. As decision architects; financial planners, educators, and lawmakers have the opportunity to help others deal with such complex situations. Yet we find that federal law compounds the complexity and may cause us to act in ways that are contrary to our long-term best interest. This paper incorporates recent psychological research in decision-making in a discussion of relevant federal retirement planning law and suggests ways that federal law should be modified to encourage retirees to manage their funds in a manner which reduces their risk of financial ruin.

Thaler and Sunstein (2008) develop a framework for incorporating research on decision-making into mechanisms for improving human lives. Their book, *NUDGE: Improving Decisions About Health, Wealth, and Happiness,* is being widely referenced in discussions about how to understand and improve decision-making processes in a wide variety of situations. Their system includes six steps. They recognize that incentives are useful for encouraging productive behavior. Second, it is also important for individuals to understand the mapping for the relevant decision. Third, default choices should be chosen with care by decision architects since they are often chosen via inertia by the actual decision-makers. Fourth, decision-makers need constructive feedback. Fifth, errors should be expected and the decision-making process should be constructed to accommodate a high error rate. Finally, complex decisions should be structured so as to reduce what can easily be overwhelming complexity.

THE PSYCHOLOGY OF RETIREMENT WITHDRAWAL DECISIONS

Cognitive illusions (Von Winterfeldt & Edwards, 1986) are a common problem in decision making. They cause systematic errors in a predictable direction (Galotti, 1999). Cognitive illusions can be divided into three general categories: biases, such as excessive optimism, overconfidence, confirmation, and the illusion of control; heuristics, such as representativeness, availability, anchoring, and affect; and framing effects, such as loss aversion (Shefrin, 2007).

Biases

Research has not addressed what is an acceptable probability of failure. This is important because humans often exhibit illusory (excessive) optimism or *optimistic bias* as identified by Rothman, Klein & Weinstein (1996) and Weinstein, (1980, 1989). Illusory optimism allows humans to create *personal fables* (Elkind, 1967); assuring themselves that disaster will only befall others (Weinstein, 1980). Earvin "Magic" Johnson wrote that he didn't think it could happen to him (Johnson, 1993). He is not alone in that mistake. However, such personal fables permit us to defy the odds, and even experience; by marrying again, by procreating, and in general by confidently planning for the future in the face of what is, by age 60, a 2% or 3 % chance that we will not live beyond a year. Optimistic bias allows us to be happy in the face of our ultimate demise.

An optimistic bias may have several roots. Reyna and Farley (2006) identify an increase in cognitive illusions with age due to an increased reliance on gist-based thinking which is founded on social knowledge and experience that increases with age (Reyna & Adams, 2003). Research also finds a positivity effect wherein older adults pay more attention to and remember more positive information as opposed to negative information than do young adults (Mather & Carstensen, 2005). Thus it may be highly relevant to retirement planning especially when emotionality is involved. Moreover, other illusions appear to contribute to compromised retirement decision-making.

People are, in general, more confident about things they know something about (Stephen & Kiell, 2000). Overconfidence can lead to rejecting help and rating one's own intuitive higher than objective information (Galotti, 1999). Perceived control is a related factor (Ajzen, 1991). Investors may suffer from an illusion of control over the performance of their investments (Langer, 1982; Tversky & Heath, 1991). However, research is mixed as to whether this is general optimism or motivated reasoning (bias towards preferred outcomes) (Krizam & Windschitl, 2007). An interesting review of the subject is contained in (Wärneryd, 2001). Nofsinger (2008, p. 11) sums up the essential fact when he states: "Even without information, people believe the stocks they own will perform better than stocks they do not own".

Optimism bias is enhanced by ignorance and by confirmation bias. Krueger and Dunning (1999) find that most students scoring at the low end of tests believe they had scored in the top half. The students simply do not know enough to realize they do not know enough. "Ignorance more freely begets confidence than does knowledge" (Darwin, 1871, p. 3). We compound the problem of ignorance by seeking confirming evidence (confirmation bias) while ignoring evidence to the contrary (Baron, 1985, 1994). However, Armor and Taylor, (2002) do caution that attempting to reduce optimistic bias in decision-making to increase accuracy may be counterproductive by undermining performance.

Heuristics

Retirement planning decisions are likely to be influenced by representativeness and availability heuristics (Tversky & Kahneman, 1973). We judge the likelihood of outcomes, such as the likelihood of loss on investments or living a long time, by comparing to our mental representation of that event or situation. If we have a readily available example, such as a superannuated close relative or a recently observed indigent person, we are likely to overstate the likelihood of those same events within our own lives. The same phenomenon, with the opposite conclusions, would be true if close relatives died young (not needing much retirement income) or lived well in retirement.

Similarly, we too often make decisions based on emotion and scanty evidence. This error, referred to as *affect* (a.k.a. affect heuristics), is related to the confirmation bias (Shefrin, 2007). Furthermore, affect

can lead to walking away from choice. In a review of economic choice in decision-making, Carpenter (2005) notes that the rate of walking away from a choice of retirement plans correlates positively with an increase in the number of options (i.e., retirement plans). Lerner and Gonzalez (2005) suggest fear may serve to increase the perception of risk. Hsee & Rottenstreich (2004) found that aroused emotions are related to an increase in the insensitivity to the magnitude of numbers. Loewenstein and Lerner (2003) explore the complexities of emotion and decision-making. They distinguish between immediate emotions and expected emotions, finding that immediate emotions can highjack rational decision making while expected emotions are prone to errors of predicting how we will feel in a certain situation. We also allow decisions to be affected by an initial anchor. This is why sellers ask high prices and why buyers make initially low offers. In both cases the party stating the price is trying to influence the range of prices considered reasonable (Shefrin, 2007).

Framing

Loss aversion (Putler, 1992) causes us to value losses more than gains, and commitment (Shubik, 1971) causes us to stick with strategies even when we realize those strategies are not likely to work to our advantage. In combination, we find it difficult to realize losses and therefore ride losers to the bottom. Retirees are therefore prone to continue holding losing investments (Shefrin & Statman, 1986) hoping to get back to even when they might benefit from locking in value by selling and annuitizing. Retirees may also cling to the belief that they can spend more than is justified by their current portfolio balance.

Framing causes us to create a context within which we make a decision, and we may reach radically different conclusions depending on how the decision is framed. Even the way we state results (1 in 100 will die as opposed to 1%) influences the perception of risk. We can shape decisions by requiring people to opt out if we want them to say yes or requiring them to opt in if we want them to say no (Johnson & Goldstein, 2003; Madrian & Shea, 2001).

Framing, as applied to retirement planning, is an essential element of the choice landscape as developed in Thaler and Sunstein's *NUDGE* (2008) and can be used to sway individuals to make decisions in their own best interest. Thaler and Sunstein give as examples the success of the 2006 US Pension Protection Act and Save More Tomorrow (Thaler & Benartzi, 2004) programs. Under "opt-out" rules enrollment and savings rates soar (Madrian & Shea, 2001). However, these programs are designed only to increase savings and not to help retirees manage their withdrawals over the remainder of their lifetime.

The mental landscape within which we make retirement planning decisions leads to many planning errors. We don't save enough, invest appropriately, or withdraw in a manner designed to last the remainder of our lifetime. We make these errors because we exhibit excessive optimism caused by overconfidence (bolstered by ignorance and an illusion of control) in our ability to make investment decisions. We apply faulty heuristics inordinately influenced by availability and representativeness, seek confirmation of our decisions, and allow anchors to distort reasonable outcomes. Finally, we irrationally attempt to avoid losses and are inordinately affected by how choices are framed. It is little wonder that we fail to make optimal decisions about how to manage our financial resources in retirement.

If my personal financial planner indicates that a particular withdrawal strategy infers a 10% chance of ruin; I hear the words, but am (over)confident that I am not one of those poor fellows who will experience such a disaster. We should not make the mistake of inferring from my behavior that I am actually willing to take this level of risk. I may not comprehend the risk I am taking and may well have created my own personal fable that exempts me **(**Alberts, Elkind, & Ginsberg, 2007; Elkind, 1967). Few among us look with anything but horror at the prospect of being indigent. Such fear may increase the perception of risk. We are willing to take extreme measures, such as coming out of retirement or severely cutting expenses, to avoid such an outcome. Failure (a.k.a. ruin or bankruptcy) in retirement planning, for many of us, is simply not an option. It is the strategies that allow us to avoid failure, rather than those that merely control the level of its incidence, that are relevant in our lives. Financial planners have a responsibility to guide clients in a manner consistent with how those clients are likely to behave; and people are likely to take

evasive action, no matter how severe that may need to be, to avoid running out of money during their lifetime.

RETIREMENT WITHDRAWAL DECISIONS FOR IRA ACCOUNTS: THE DILEMMA

We do not save enough and do not withdraw in a manner designed to last our lifetime. An IRA (Individual Retirement Arrangement but commonly referred to as Individual Retirement Account) provides a tax-sheltered investment during a person's working years. Most IRAs are either Traditional (tax-deductible deposits and taxable withdrawals) or Roth (after-tax deposits and tax-exempt withdrawals), although Education, SEP, and Simple IRAs also exist.

Traditional IRAs have minimum withdrawal rates beginning at age 70½. The calculation of Required Minimum Distributions (RMD) is complex, but may be summarized as dividing the account balance on December 31 of the previous year by a table value (Uniform Lifetime Table) which is a function of age. Special rules apply if the retiree's spouse is more than 10 years younger, for spouses of deceased retirees, and for beneficiaries. RMDs exist because retirees who can afford to not tap their tax-advantaged savings (IRA) may elect to defer withdrawals, depriving the federal government of income tax. There is a 50% excise tax on any portion of the RMD that is not actually withdrawn. However, many retirees, who need or desire more current income, are likely to deplete their IRA much sooner leaving them without a source of income to supplement Social Security or other pensions. Roth IRAs do not have RMDs. However, non-spouse beneficiaries are required to withdraw the funds within 5 years or as an annuity over their expected lifetime.

RMDs on Traditional IRAs utilizing the Uniform Lifetime Table tend to be less than the withdrawal rate recommended in Mitchell (2010) until approximately age 90. The RMD is calculated by taking the inverse of the Table Value from the Uniform Lifetime Table and the retiree's current age. See Table 1. The recommendation from Mitchell (2010) is the median withdrawal rate for each age. The median is not a stable value, particularly at advanced ages when the sample size is greatly diminished, but does indicate a rough estimate of optimal behavior. The fact that the RMD percentage is lower than the recommended percentage until approximately age 90 indicates that the RMD itself is not causing shortened portfolio longevity relative to optimal behavior for avoiding ruin, except perhaps at advanced ages. In fact, RMDs may be leading younger retirees to withdraw funds more slowly than the pace that would lead them to smooth real income over their remaining lifetime. This also means that the U.S. Treasury is receiving less tax revenue from holders of Traditional IRAs than would be received if retirees followed an optimal strategy, again assuming that retirees follow the RMDs.

RMDs are an artificial withdrawal strategy based only on expected longevity and thus abstracted from consideration of typical market returns. There is no reason to expect such a strategy to match an optimal withdrawal pattern even though the penalty for withdrawing funds before age 59½ and RMDs both serve to encourage retirees to delay withdrawals until later in life.

IRA MANAGEMENT IN PRACTICE

Holden and Bogdan (2008), report that as of 2007 approximately 40% of US households own a combined $4.6 trillion of IRAs representing 33% of their household financial assets. Most, about 75%, of IRAs are Traditional. However, data from 2006 suggests that only 37% of households with IRAs contribute new funds annually, and even fewer, 11% of eligible households, make catch-up contributions.

Copeland (2009), reports that only 40.6% of US households include a participant in an employer-sponsored retirement plan (defined benefit or defined contribution) in 2007. Of those families with any type of retirement program account, the average balance in 2007 is $148,440 of which 43.7% ($64,804) is from IRAs. For families with incomes from $10,000 to $25,000 IRAs represent an even higher 63.8% of retirement assets.

The importance of IRAs in retirement planning is further evidenced by the fact that the average IRA balance, including roll-overs, is 2.64 times the non-rollover balance (Copeland, 2009). Clearly, rolling

over retirement accounts from previous employers is an important part of the use of IRAs and necessitates thinking of IRAs in the same manner as other retirement programs.

Data on withdrawals from IRAs, also reported by Holden and Bogdan (2008), indicates that between 1999 and 2006 retirees over age 70 who made withdrawals, tended to make partial withdrawals (93%) with a median size of $4,000 and did so predominately (75% of those who made withdrawals) to satisfy RMDs. Retirees between 59 and 70 also tended to make partial withdrawals (86%) though with a median size of $10,000 with living expenses cited as the most common (35%) cause. Among IRA holders under 59, 31% of those making withdrawals withdrew the entire amount and again living expenses were most often cited as the cause, despite the 10% early withdrawal penalty. Withdrawals from Traditional IRAs are most often based on needs with nearly 40% of IRA holders who make withdrawals not basing those withdrawals on a systematic plan or RMDs. While 71% express the desire to maintain IRA assets as long as possible; a significant percent, particularly of younger IRA holders, withdraw part, or all, of their IRA. Retirees may therefore benefit from a plan to systematically manage their withdrawals in a manner which will ensure availability of this supplement to Social Security and other retirement income.

As Copeland (2009, p.5) states, "Retirement plans can help workers accumulate assets, but when individuals are given choices, it is their actions that will ultimately determine whether or not they achieve financial security". It is the purpose of this paper to help retirees improve those choices by improving the landscape within which retirement planning choices are made.

LIFETIME INDIVIDUAL RETIREMENT ARRANGEMENTS (LIRA)

We can encourage retirees to manage their retirement savings in a manner which will provide them with a lifetime income to reliably supplement Social Security by providing appropriate withdrawal plans and by providing tax incentives to encourage participation. Because this plan is designed to convert retirement savings into a lifetime income, the acronym LIRA (Lifetime Individual Retirement Arrangement) is proposed.

Under this plan enrollees would be placed in one of several standardized investment portfolios. These plans could be set up any time during an enrollee's lifetime with existing IRA assets rolled over into one of the standardized portfolios. The reason for utilizing standardized portfolios is partly to simplify the landscape for the enrollee, and partly for ease of managing withdrawals on the part of the fiduciary. Standardized portfolios will encourage competition on the part of fiduciaries and drive down management fees. Non-standardized portfolios could be permitted, but the cost of managing withdrawals to last a lifetime for non-standard portfolios would be cost prohibitive unless further research provides clear guidelines.

Obviously, disenrollment would need to be provided in hardship cases. Likewise, concerns that IRA assets will all be consumed during one's lifetime and not available to heirs, as typically is the case with annuities, could be alleviated thru education. Both Stout and Mitchell (2006) and Mitchell (2009) demonstrate that the real value of portfolios can be maintained at near initial levels while providing significant lifetime income. However, it is important to emphasize that LIRA is a program to smooth retirement income over a lifetime and is not a guarantee.

A variety of plans could be offered varying from a plan similar to, and perhaps invested in, inflation-protected securities to a diversified stock and bond plan:

1. Plan A is the safest but lowest yielding plan might invest in Treasury Inflation-protected Securities (TIPS). Obviously the rate of return would tend to be lower with such a plan. Further research is needed to predict typical withdrawal rates.
2. Plan B is a fixed real return plan might invest, for example, in a 65% large-cap stock index and 35% Intermediate-term Government Bonds portfolio. Such a plan is shown to provide a 4.5% fixed real rate of return for retirees age 60 with a 7.16% probability of failure (Stout & Mitchell, 2006). An alternative SAFEMAX plan (Bengen, 2006) could be offered at a lower (4.18%) withdrawal rate. Bengen's SAFEMAX is specified as the highest fixed real withdrawal rate without causing ruin. Recommended withdrawal rates will, of course, depend on the age when

withdrawals begin with substantial benefits to later retirement ages as implied by Table 1. The various example rates are based on different studies with different methodologies. Using different methodology, and in contrast to Bengen, Mitchell (2010) finds an approximate 2% SAFEMAX based on 1926-2009 data. Mulvey and Purcell (2008) provide a useful review of the literature.

3. Plan C is a variable rate plan based on the same portfolio as Plan B is shown to provide 60-year old retirees with a 6.04% median lifetime average withdrawal rate (median of the lifetime average over 50,000 simulation iterations) with virtually zero (.2%) probability of ruin when actively managed (Mitchell, 2010). The fiduciary would be responsible for maintaining the portfolio, providing reports, and making payments to the retiree. Fiduciaries would be provided with rules, varying by plan, governing the amount of the payments. The six factor set of rules necessary to provide the 6.04% median lifetime average withdrawal rate is shown in Mitchell, 2010. The rules could easily be programmed into a spreadsheet or an interactive website could be created to provide individualized withdrawal rates. Obviously, further research may provide both simpler and more productive sets of withdrawal rate management rules.

NUDGE (Thaler & Sunstein, 2008) involves six aspects:

1. Incentives: The incentives to participate in LIRA could be some combination of a reduced tax rate on the retirement income from Traditional IRAs, a relaxation of minimum withdrawal rules, and exemption of any remaining portfolio from inheritance tax. Enrollees also have the incentive of knowing that they have a virtually guaranteed supplement to Social Security, although some plans may have variable returns.

2. Understanding Mapping: Potential participants could be provided with information about the risk they assume both with and without using LIRA. The stability and income they risk losing by not participating (loss aversion) should be emphasized. Thus, fear is reduced thru education. They should also be educated regarding the rewards typically associated with higher equity allocation portfolios. This could be accomplished by comparing the average withdrawal rate for various allocation choices. Availability and representativeness could be enhanced by providing examples at the time of enrollment of how people might be affected. The availability of a limited number of plans effectively anchors the decision and helps enrollees with limited knowledge of financial markets to avoid extremely risky investment choices. Data on the choices made by other enrollees might help confirm decisions for enrollees.

3. Default Option: The laws authorizing IRAs could be amended to make Plan A the default option. Retirees would thus be given the lowest level of risk. By framing the decision in this "opt-out" approach participation would increase.

4. Give Feedback: Participants should receive periodic statements of the performance of their plan and updated projections of future income. They should also be given projections as to how they would be affected by a decision to switch between plans.

5. Expect errors: By offering a limited number of plans, the potential for errors is minimized. In fact, the self-management errors due to excessive optimism, loss aversion, commitment, and perceived control that are committed by many investors would be discouraged since participants are not actively managing their portfolios. The fact that enrollees could change their plan choice later in life allows errors to be corrected.

6. Complexity: LIRA reduces the complexity in the decision-making environment faced by potential enrollees and therefore should increase the participation rate. A single decision is made regarding allocation. The roadblock to making IRA investments posed by uncertainty about how to invest the funds is removed, or at least reduced. Enrollees know that they are signing up for what should be regarded as an individualized supplement to Social Security because LIRA creates a lifetime income in the same manner as Social Security, but with some individual choice as to both the amount and manner of investment of funds.

IMPLICATIONS

Retirees with 'guaranteed' lifetime income can better make choices about their retirement. In many cases the alternative to the lower than expected retirement income (caused by low savings) which will be revealed by this proposal is to shorten retirement by delaying its onset. The second implication for retirees is the reduced anxiety about the amount of retirement income they will receive. Loss aversion tells us that retirees would prefer a guaranteed income rather than risk losing their entire income.

The federal government would have a more predictable source of income if retirees participated in LIRA. On average, retirees would withdraw funds later in life, delaying tax revenue due to the remaining portfolio balances (funds passed to future generations) typical in programs designed to last a lifetime. The federal government also might need to offer financial incentives such as reduced tax rates or exemption from estate tax.

Financial institutions providing IRA, 401(k), and other tax-advantaged plans will compete for management of the LIRA plans. While competition will likely drive down fees associated with standardized plans, the potential exists for increased business as LIRA provides additional incentives for retirement savers to participate. However, to the extent that LIRA steers IRA investments away from CDs, depository financial institutions may lose assets.

Individually managed retirement programs have become a more important source of retirement income and given the decline in defined benefit programs will continue to increase in the percentage of retirement income they provide. Society is served to the extent that retirees are encouraged to make choices that positively affect their financial security and reduce the incidence of indigence. The impending inadequacy of the Social Security Trust Fund provides additional impetus to efforts designed to reduce retiree reliance on government programs.

CONCLUSION

Psychological principles of behavior and perception describe how we, as individuals, make retirement planning decisions. The programs and governing laws that define how individuals make retirement planning decisions should be congruent with those principles. Current decision-making rules under federal law encourage spreading retirement plan withdrawals over a long period of time, but may not mimic optimal behavior. NUDGE, as developed by Thaler and Sunstein (2008), provides a six step process for designing a decision-making environment. Those same six steps are applied in this paper to the retirement planning dilemma to create a proposal (LIRA) for modification of federal rules with the intent to improve the decision-making process of individual retirees. Implications of the proposal for retirees, the federal budget, and the financial services industry are explored. Adoption of LIRA would provide retirees with a significant supplement to Social Security at a time when it is increasingly likely that many retirees will need an alternative source of retirement income.

REFERENCES

Ajzen, I., 1991, The theory of planned behavior, *Organizational Behavior and Human Decision Processes 50*, 179-211.

Alberts, A.D., S. Elkind, and S. Ginsberg, 2007, The personal fable and risk-taking in early adolescence, *Journal of Youth and Adolescence 36*, 71-76.

Armor, D. A., and S. E. Taylor, 2002, When predictions fail: The dilemma of unrealistic optimism, in: T. Gilovich, D. Griffin, and D. Kahneman, eds, *Heuristics & biases* (Cambridge University Press, Cambridge, UK), 334-347.

Baron, J., 1985, *Rationality and intelligence* (Cambridge University Press, Cambridge, UK).

Baron, J., 1994, *Thinking and deciding* (2nd ed.), (Cambridge University Press, Cambridge, UK).

Bengen, W. P., 2006, *Conserving client portfolios during retirement* (FPA Press, Denver, CO).

Carpenter, S., 2005, The rich science of economic choice. *APS Observer 18*(4), 20-27.

Copeland, C., 2009, *Individual account retirement plans: An analysis of the 2007 survey of consumer finances, with market adjustments to June 2009*, Issue Brief No. 333 (Employee Benefit Research Institute, Washington, DC).

Darwin, C., 1871, *The descent of man* (D. Appleton and Co., New York, NY).

Elkind, D., 1967, Egocentrism in adolescence, *Child Development 38*, 1025–1034.

Employee Benefit Research Institute, 2009, *The basics of Social Security updated with the 2009 board of trustees report (*author, Washington, DC).

Galotti, K. M., 1999, *Cognitive psychology in and out of the laboratory* (2nd ed.) (International Thompson Publishing, Albany, NY).

Gilovich, T., D. W. Griffen, and D. Kahneman, 2002, *Heuristic and biases: The psychology of intuitive judgment* (Cambridge University Press, Cambridge, UK).

Holden, S., and M. Bogdan, 2008, The role of IRAs in U.S. households' savings for retirement, *Research Fundamentals* (Employee Benefit Research Institute, Washington, DC).

Hsee, C. K., and Y. Rottenstreich, 2004, Music, pandas, and muggers: On the affective psychology of value, *Journal of Experimental Psychology: General 133,* 23-30.

Internal Revenue Service, 2009, *Publication 590: Individual retirement arrangements* (Department of Treasury, Washington, DC).

Johnson, E., 1993, *My life* (Fawcett Crest, New York, NY).

Johnson, E. J., and D. Goldstein, 2003, Do defaults save lives? *Science 302*, 1338-1339.

Krizam, Z., and P. D. Windschitl, 2007, The influence of outcome desirability on optimism, *Psychological Bulletin 133*, 95-121.

Kruger, J., and D. Dunning, 1999, Unskilled and unaware of it: How difficulties in recognizing one's own incompetence lead to inflated self-assessments, *Journal of Personality and Social Psychology 77*, 1121-1134.

Langer, E. J., 1982, The illusion of control, in: D. Kahneman, P. Slovic, and A. Tversky, eds, *Judgment under uncertainty: Heuristics and biases* (Cambridge University Press, Cambridge, UK) 231-238.

Lerner, J. S., and R. M. Gonzalez, 2005, Forecasting one's future based on fleeting subjective experiences, *Personality and Social Psychology Bulletin 31*(4), 454-466.

Lowenstein, G., and J. S. Lerner, 2003, The role of affect in decision making, in: R. J. Davidson, K. R.

Scherer, and H. H. Goldsmith, eds, *Handbook of affective sciences* (Oxford University Press, New York, NY), 619-642.

Madrian, B. C., and D. F. Shea, 2001, The power of suggestion: Inertia in 401(k) participation and savings behavior, *Quarterly Journal of Economics 116*, 1149-1225.

Mather, M., and L. L. Carstensen, 2003, Aging and attentional biases for emotional faces, *Psychological Science 14*, 409-415.

Mitchell, J. B., 2011, Withdrawal rate strategies for retirement portfolios: Preventive reductions and risk management. Forthcoming in *Financial Services Review*.

Mitchell, J. B., 2010, A modified life expectancy approach to withdrawal rate management [Internet document] (Social Science Research Network) [created 7 November 2010], available from SSRN: http://ssrn.com/abstract=1703948.

Mulvey, J., and P. Purcell, 2008, *Converting retirement savings into income: Annuities and periodic withdrawals* (Congressional Research Service, Washington, DC).

Nofsinger, J. R., 2008, *The psychology of investing* (Pearson Prentice-Hall, Upper Saddle River, NJ), 9-19.

Putler, D., 1992, Incorporating reference price effects into a theory of consumer choice, *Marketing Science 11*, 287-309.

Reyna, V. F., and M. B. Adams, 2003, Fuzzy-trace theory, risk communication, and product labeling in sexually transmitted diseases, *Risk analysis 23,* 325-342.

Reyna, V. F., and F. Farley, 2006, Risk and rationality in adolescent decision making: Implications for theory, practice, and public policy, *Psychological Science in the Public Interest 7*(1), 1-44.

Rothman, A. J., W. M. Klein, and N. D. Weinstein, 1996, Absolute and relative biases about personal risk, *Journal of Applied Social Psychology 26*, 1213-1236.

Shefrin, H. M., 2007, *Behavioral corporate finance: Decisions that create value* (McGraw-Hill, New York, NY).

Shefrin, H. M., and M. Statman, 1986, How not to make money in the stock market, *Psychology Today 20*, 52-54.

Shubik, M., 1971, The dollar auction game: A paradox in noncooperative behavior and escalation, *Journal of Conflict Resolution 15*, 109-111.

Stephan, E., and G. Kiell, 2000, Decision processes in professional investors: Does expertise moderate judgmental biases? in: E. Hnlzl, ed., IAREP/SABE *conference proceedings: Fairness and competition* (Universitätsverlag, Vienna, WUV), 416-420.

Stout, R. G., and J. B. Mitchell, 2006, Dynamic retirement withdrawal planning, *Financial Services Review 15,* 117-131.

Thaler, H. T., and S. Benartzi, 2004, Save more tomorrow: Using behavioral economics to increase employee saving, *Journal of Political Economy 112*, S164-187.

Thaler, H. T., and C. R. Sunstein, 2008, *Nudge: Improving decisions about health, wealth, and happiness* (Penguin Books, New York, NY).

Tversky, A., and C. Heath, 1991, Preferences and beliefs: Ambiguity and competence in choice under uncertainty, *Journal of Risk and Uncertainty 4*, 5-28.

Tversky, A., and D. Kahneman, 1973, Availability: A heuristic for judging frequency and probability, *Cognitive Psychology 4*, 207-232.

Wärneryd, K. E., 2001, *Stock-market psychology: How people value and trade stocks* (Edward Elgar, Cheltenham, UK), 162-177.

Von Winterfeldt, D., and W. Edwards, 1986, On cognitive illusions and their implications, in: H. R. Arkes, and K. R. Hammond, eds, *Judgment and decision making: An interdisciplinary reader* (Cambridge University Press, Cambridge, UK), 642-679.

Weinstein, N. D., 1980, Excessive optimism and future life events, *Journal of Personality and Social Psychology 39*, 806-820.

Weinstein, N. D., 1989, Optimistic biases about personal risks, *Science 246,* 1232-1233.

TABLE 1
REQUIRED MINIMUM DISTRIBUTION IMPLICATIONS

Age	IRS Table Value	Implied RMD %	Recommended
70	27.4	3.65%	7.01%
75	22.9	4.37%	7.40%
80	18.7	5.35%	7.72%
85	14.8	6.76%	8.16%
90	11.4	8.77%	8.99%
95	8.6	11.63%	11.08%
100	6.3	15.87%	15.50%
105	4.5	22.22%	23.96%

Note. Required Minimum Distributions compared to recommended withdrawal rates for Ages 70 to 105. Implied RMDs are the inverse of the IRS Table Value. Life Table values from IRS Publication 590, Table III (Internal Revenue Service, 2009). Recommended withdrawal rates from Mitchell (2010).