

## **Ain't Misbehavin'!**

**Behavioral economics helps explain the  
reality of participant behavior**

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### What is behavioral economics?

Behavioral economics (also called behavioral finance) has found its footing in the world of microeconomics as economists are recognizing that traditional economic theory fails to fully explain human behavior. Classical and neoclassical theory is based on the idea of “economic man,” a wholly rational being who analyzes all options and makes decisions based on self-interest, ultimately making the choices that are of the greatest utility (the economist’s term for happiness) to himself. It is on this premise that the laws of supply and demand, as well as the idea of an efficient market, function. However, real human beings often act in irrational ways, making choices that fly in the face of “economic man.”

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“Economic Man makes logical, rational, self-interested decisions that weigh costs against benefits and maximize value and profit to himself. Economic Man is an intelligent, analytic, selfish creature who has perfect self-regulation in pursuit of his future goals and is unswayed by bodily states and feelings. And Economic Man is a marvelously convenient pawn for building academic theories. ***But Economic Man has one fatal flaw: he does not exist.***”

- Lambert, 2006

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Economic rational choice theory, part of traditional theory, is based on four basic assumptions about the way people make decisions:

1. **Cancellation** — Choice is independent of irrelevant alternatives: “If an individual prefers A over B she will not change her preference if, say, it will rain tomorrow.”
2. **Transitivity** — “If A is preferred over B and B over C then also A is preferred over C.”
3. **Dominance** — “If one option is preferred to another then that option should be chosen.”
4. **Invariance** — Preference is independent of how the options are presented.

*“It has often been shown that people in the real world violate one or more of these four assumptions.”*

(Heukelom, 2006)

According to behavioral economists, these irrational behaviors are actually rather consistent and have their own rules and logic. The study of the systematic ways in which people make irrational financial decisions is behavioral economics.

Since early studies combining economics with psychology and sociology in the 1970s, the field of behavioral economics has been gaining traction. Today, Harvard, MIT, Stanford, the University of Chicago, Princeton, Yale, and the University of California at Berkeley boast economists who integrate behavioral finance into their theories of economics.

The findings of behavioral finance have been and will likely continue to be of particular interest to retirement plan sponsors. Any employer who has sponsored a plan is familiar with this struggle: defined contribution plans are designed to provide participants with control and choices, but inertia, procrastination, and ill-informed investment decisions pose significant obstacles to overcome. Plan sponsors are charged with the task of helping employees prepare for a secure retirement, but participants’ self-defeating behavior often undermines this goal.

Now, behavioral finance provides an explanation for irrational participant behavior. By better understanding the heuristics, or mental biases, people are prone to when making decisions, plan sponsors will be better able to structure an effective plan and communication strategy.

### Prospect theory

Through studying human behavior, behavioral economists have made some key observations about how people make decisions. In 1979, Daniel Kahneman and Amos Tversky formulated the prospect theory as an alternative to expected utility theory. Expected utility theory suggests that when faced with a risky decision, a person will consider a straightforward combination of the probabilities and potential payouts, with some allowance for personal preferences as part of the decision. Prospect theory, on the other hand, describes the decision-making process as not based on these absolute values but as a relative decision. Decision-makers will set their own reference point and then assign value to options based on how they change from that reference.

#### *Reference dependence, anchoring, and framing*

You are out shopping and come across a shirt for \$75. You pass it up as slightly overpriced, especially compared to all of the \$50 shirts in the shop. You then, however, find the same shirt in another store — it's still \$75, but this time marked down from \$210. Suddenly it seems like quite a bargain. Your decision to purchase the shirt is not based on whether having the shirt is better than having \$75, as traditional theory posits. Instead, it is based on judging the shirt's value according to your frame of reference.

This is an example of reference dependence, illustrating the prospect theory's decision-making process, in which the context largely determines the choice. In fact, researchers have found that even an insignificant or irrelevant fact, when presented at the time of decision making, can influence a person's choices. This phenomenon is called anchoring, in which a decision-maker anchors on a particular reference point and then adjusts from that point to make a decision.

### From Adam Smith to behavioral economics

*While behavioral economics is a relatively new field of study, some of its ideas can be traced back to the earliest days of economic study. Adam Smith, known as the 'father of modern economics,' not only wrote The Wealth of Nations, but also penned The Theory of Moral Sentiments, which explores the psychological foundations of human behavior. In this tome, Smith presciently rejects the notion that human beings are driven purely by utility and self-interest, but behave in alignment with principles of sympathy. John Maynard Keynes, even as he spearheaded a revolution in macroeconomics in the early 20th century, also showed interest in the ways in which psychology can illuminate economics. (Camerer & Loewenstein, 2002) Throughout the early 20th century, however, most economists eschewed psychology as lacking adequate scientific foundation to be useful in developing economic theory.*

*By mid-century, however, economists were faced with criticism that their assumption of purely rational, analytical thought was unrealistic. Researchers put forth ideas of "bounded rationality" and suggested that psychology may be important to economics. Then, in the 1970s, psychologists Amos Tversky from Stanford and Daniel Kahneman from Princeton began doing focused research on how people make decisions under uncertainty. They identified the mental shortcuts, or heuristics, people use to help them make decisions when faced with a great deal of information. Tversky and Kahneman then proposed prospect theory, which was a revolutionary contradiction to the previously accepted expected utility theory, and which formed the foundation of behavioral economics.*

*"If economists want their propositions to qualify as science, and if they wish not to be vulnerable to attack, then they must reformulate their theories so that they say something about 'how people do in fact behave.'"*

*(Hutchison, 1938)*

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A classic example of anchoring comes from a study in which a wheel of fortune is spun to reveal a random number between 0 and 100. Subjects watching the spin are then asked to guess how many African nations are in the United Nations. Subjects' guesses were strongly influenced by the spin of the wheel, suggesting that "subjects seemed to 'anchor' on the number spun on the wheel and then adjusted for whatever else they thought or knew." (Camerer & Loewenstein, 2002) Overall, the higher the number spun, the higher the guess, and vice versa.

Framing is another way in which decisions are reference-dependent. The way that choices are presented can influence how those choices are evaluated and selected. For example, Tversky and Kahneman posed this problem to subjects of a study: "Imagine that the U.S. is preparing for the outbreak of an unusual Asian disease, which is expected to kill 600 people. Two alternative programs to combat the disease have been proposed....Which of the two programs would you favor?" (Tversky & Kahneman, 1981) One group of subjects was given the following programs: Program A, in which 200 people would be saved, or Program B, in which there is a 1/3 probability that all 600 people would be saved and a 2/3 probability that no one would be saved. The other group received identical programs framed in a very different way: Program C, in which 400 people will die, or Program D, in which there is a 1/3 probability that nobody will die and a 2/3 probability that 600 people will die. Most subjects in the first group selected Program A, the sure thing and a risk-averse answer. However, those presented with the second set of programs favored Program D, the riskier option, in order to avoid the certain death of 400 people. (Tversky & Kahneman, 1981)

"Ariely and a colleague asked students at M.I.T.'s Sloan School of Management to write the last two digits of their Social Security number at the top of a piece of paper. They then told the students to record, on the same paper, whether they would be willing to pay that many dollars for a fancy bottle of wine, a not-so-fancy bottle of wine, a book, or a box of chocolates. Finally, the students were told to write down the maximum figure they would be willing to spend for each item. Once they had finished, Ariely asked them whether they thought that their Social Security numbers had had any influence on their bids. The students dismissed this idea, but when Ariely tabulated the results he found that they were kidding themselves. The students whose Social Security number ended with the lowest figures — 00 to 19 — were the lowest bidders. For all the items combined, they were willing to offer, on average, sixty-seven dollars. The students in the second-lowest group — 20 to 39 — were somewhat more free-spending, offering, on average, a hundred and two dollars. The pattern continued up to the highest group — 80 to 99 — whose members were willing to spend an average of a hundred and ninety-eight dollars, or three times as much as those in the lowest group, for the same items."

- Kolbert, 2008

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Participants show markedly different patterns of behavior based on the effects of framing. When enrollment is framed as a negative choice — as in automatic enrollment — and participants only need to take action if they want to opt out, participation rates are 28 percent higher than when enrollment is framed as a positive selection. (Choi, Laibson, Madrian, & Metrick, 2005)

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### *Loss aversion and the endowment effect*

Prospect theory adds an additional qualification to the decision-making process, which is that there is a fundamental aversion to loss: people feel the weight of a loss more than they feel the pleasure of an equal gain. In risky decisions, then, the reference point is naturally tilted toward avoiding any loss or risk, as opposed to favoring potential but uncertain rewards.

Another way to describe loss aversion is to state that people dislike losing commodities they own more than they like acquiring additional commodities.

In 1992, researcher J.L. Knetsch performed a study in which subjects were given either a mug or a pen, objects of equivalent monetary value. They were then given the option of trading in their good in exchange for the other. A purely preferential reaction should result in about half of the subjects trading. However, only 22 percent exchanged their item. (Camerer and Loewenstein, 2002) The implication is that, by ownership or by being endowed with one of the objects, the subjects' reference point shifted and there was a greater preference for the item in possession. The endowment effect occurs when property takes on a greater value in someone's mind purely because it belongs to them.

In a variation of the mug and pen experiment, half of the subjects in another study were given a mug. Those with mugs were asked to name the price at which they'd be willing to sell their mug to subjects who didn't have one. Those who were not given mugs were asked the price they'd be willing to pay for one of the seller's mugs. Logically, those prices should be pretty much the same. However, the median buying price was \$2.25 and the median selling price was \$5.79, more than twice as much! "The only difference is that sellers are 'giving up' a mug they 'own,' whereas choosers are merely giving up the right to have a mug." (Camerer and Loewenstein, 2002)

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Employers face the obstacle of loss aversion in terms of encouraging employees to participate in a plan that requires them to invest and potentially lose money. Participants' loss aversion may also cause them to adopt an investment strategy that is overly conservative.

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"When employees are offered retirement plans that include no option for investing in their own company's stock, they typically allocate half of their money to bonds and half to stocks. But when they were given the option to invest in their own company's stock, they allocated more than 40% of their money to company stock and divided the rest equally between stocks and bonds — meaning that almost three-fourths of their portfolio was now in equities, simply because they put their own company's stock in a different mental account than other equity investments."

- Surowiecki, 2006

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### *Mental accounting*

A basic principle of traditional economics is that money is fungible, meaning one dollar is the same as the next. However, studies continually show that all money is not, in fact, equal. Although people are averse to loss, different losses (or gains) are felt differently. For instance, a gambler who is ahead will take greater risks with the winnings because he is now playing with "the house's money" rather than his own. And people are more likely to splurge when they receive a windfall of money because psychologically, it's outside the household budget. We use "mental accounting" to divide our assets into categories; different categories may have very different rules and uses.

### Psychological accounting

Respondents in a study were asked to imagine one of two situations:

“Imagine that you have decided to see a play where admission is \$10 per ticket. As you enter the theater you discover that you have lost a \$10 bill. Would you still pay \$10 for a ticket for the play?”

“Imagine that you have decided to see a play and paid the admission price of \$10 per ticket. As you enter the theater you discover that you have lost the ticket. The seat was not marked and the ticket cannot be recovered. Would you pay \$10 for another ticket?”

In the first situation, 88 percent of those asked responded that they would still pay \$10 for a ticket. In the second scenario, only 46 percent would buy another ticket. “In terms of this account, the expense required to see the show was \$20, a cost which many of our respondents apparently found excessive. In [the first situation], on the other hand, the loss of \$10 is not linked specifically to the ticket purchase and its effect on the decision is accordingly slight.”

(Tversky & Kahneman, 2002)

### Heuristics

In addition to prospect theory, behavioral economists have identified a series of heuristics, or mental shortcuts, that people use when making decisions. These biases have developed in the human mind as a coping mechanism, allowing people to make decisions and take action without getting bogged down in painstaking analysis of every detail. They are sometimes very useful; the ability to make quick, instinctual judgments allows us to maneuver through the thousands of choices we make daily. However, they can also be self-defeating when making financial decisions. Understanding these heuristics provides valuable insight into the natural vulnerabilities of decision-making and thus how to strengthen the process for making important financial choices.

#### *Availability heuristic*

“A person is said to employ the availability heuristic whenever he estimates frequency or probability by the ease with which instances or associations can be brought to mind.” (Tversky & Kahneman, 1973) A person’s individual experiences and knowledge base will influence how they make judgments and predictions. For instance, a person who has numerous divorced friends will probably estimate the likelihood of a particular couple getting divorced to be higher than would someone who doesn’t know anyone who’s been divorced. Someone who has encountered a late train may conclude that the train system is faulty and often runs late. We call to mind those stories and experiences that are easy to recall and base our decisions on this readily available information. Investors who have heard stories of making it big in the stock market may underestimate the volatility of stocks, whereas someone whose family members have spoken of losses may be unusually conservative.

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### *Representativeness*

Representativeness is the tendency for people to evaluate the probability of an event based on how representative it is of a large sample or a stereotype. For example, if you flip a coin and get heads ten times in a row, most people would predict that the odds the next flip would show tails is greater than 50 percent. A flip of tails would make the string more representative of the inherent randomness of a large sample of coin flips. However, in reality, a small sample does not necessarily reflect the larger sample and any flip of the coin has no more and no less than a 50 percent chance of turning up heads or tails regardless of the previous flips.

“Representativeness is used because (i) it is accessible, (ii) it often correlates with probability, and (iii) people overestimate this correlation. The reliance on representativeness, however, leads to predictable errors of judgment because representativeness has a logic of its own, which differs from the logic of probability.”

(Tversky & Kahneman, 1982)

### *Overconfidence*

In order to make a decision that will have future consequences, a person has to make some prediction about the future. Overconfidence becomes a factor because people will naturally attribute a high degree of accuracy to their own predictions even when there is little information that would support an accurate prediction. Overconfidence is particularly an issue for enthusiastic but novice investors; with a little bit of information (such as an investment tip from a friend or a newspaper article), they may select overly aggressive investments or buy and sell frequently with a high degree of confidence in their ability to pick securities.

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“Thirty-one percent of workers who have not saved for retirement nonetheless feel very or somewhat confident that they will have a comfortable retirement.”

(EBRI, 2009)

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### *Magical thinking*

A sports fans who yells at his television set, a student who wears her lucky blouse to a test, a car passenger who presses an imaginary brake pedal at a red light: all of these people are engaged in magical thinking. This bias prompts us to believe we cause or influence events over which, in reality, we have no control.

### *Hindsight bias*

How many people looked back at the bursting of the real estate bubble and said, “I knew that was coming?” With hindsight bias, people overestimate their ability to have predicted events that have already occurred. We are essentially able to rewrite history, placing ourselves in the role of seer. The unfortunate consequence is overconfidence in our ability to make further predictions. An investor, for example, who purchases a stock which subsequently skyrockets in value, may say to herself, “I just knew that would happen. I must have a knack for picking the right stocks.”

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### *Cognitive dissonance*

Cognitive dissonance refers to our unusual ability to believe something that is clearly inconsistent with the facts, often because it is a belief that we have had for a long time. For instance, in a recent participant survey, it was demonstrated that 54 percent of respondents did not believe you could lose money in a government bond fund. (John Hancock, 2002) These participants had likely received education and information to the contrary, but it was the ingrained belief that held and was recalled when prompted.

### *Hyperbolic discounting*

In 1981, Richard Thaler performed a study in which he asked subjects to imagine that they had won the lottery and could either receive the money now or earn interest and wait until later. Subjects were then asked how much they would have to be paid to make the latter choice as attractive as the former. The result was an estimate of how much a future reward is discounted in value compared to an immediate reward. (Camerer & Loewenstein, 2002) In other words, getting something now is usually more attractive (and by a significant amount) than getting something in the future. It is partially for this reason that people procrastinate, use credit cards, and fail to save for retirement. The future payoff must exceed the value of the immediate payoff, *after it has been discounted* for the time period in between.

### *Curse of knowledge*

Teaching is a difficult profession in part because with a base of knowledge, it's difficult to imagine not having that knowledge. The curse of knowledge makes it hard to understand perspectives that don't have the same foundation of information. Plan sponsors need to be able to put themselves in participants' shoes to understand why some are quite uncomfortable making financial decisions.

### **Behavioral economics at work**

The principles of behavioral economics have already engendered some successes when applied institutionally:

“A large trading firm understands the powerful tug loss-aversion has on inhibiting its traders from closing out trading positions which have lost money, clouding their judgment. So the firm takes two traders and swaps their positions: Sharon's portfolio at day-end on Tuesday is given to Colin to manage in the morning on Wednesday, and vice versa. The new traders feel less emotional attachment to the new position they inherited from the other trader (and ideally, don't even know the prices at which the position was initiated) and exhibit less or no disposition effect.” (Camerer, 2003)

“Software designers and other experts often suffer from a 'curse of knowledge:' They find it hard to imagine how little others know about their area of expertise. So Microsoft found that its software experts were surprised, and skeptical, about reports from help-line employees about how buggy callers found Microsoft software to be. They installed a room with a one-way mirror in which designers could watch typical users struggle with their software.... The result was that designers realized how difficult their software was for average people to comprehend.” (Camerer, 2003)

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### *Paralysis of choice*

One fundamental idea of a free market system is the availability of options. Making choices creates healthy competition. However, behavioral economists have discovered that more is not always better when it comes to choices. In a recent study of shoppers, subjects were offered free samples of jams. Some shoppers were offered a choice of six jams, while others were offered samples of twenty-four different kinds of jams. Those whose selection was limited to six were more likely to end up buying a jar of jam than those offered the broader assortment. (Cook & Company, 2004) People faced with an overwhelming array of choices become paralyzed and avoid making any choice at all.

Defined contribution plan participation actually drops as the number of fund options increases. In a recent study, participation dropped from 75% to 70% when the number of funds increased from two to 11. (Iyengar & Jiang, 2005) Faced with all of the decisions involved in enrolling in a plan and creating an investment strategy, many employees will procrastinate indefinitely or simply toss their enrollment form into the recycling bin out of pure frustration.

### *Fairness*

There is a classic game in which one player, Player A, is given ten dollars. Player A is then asked to make an offer of any portion (in whole dollars) of that to Player B. Player B may accept or decline the offer. Both players are told that if Player B accepts the offer, players may divide the money and keep their shares. However, if Player B declines the offer, neither player may keep any share of the money. Here's how homo economicus would play: Player A would offer the smallest amount possible, one dollar. Player B would accept it, since something is better than nothing. *That's the only truly rational outcome.* However, the game almost never plays out that way in actuality. Player A subjects vary in their offers — some feel a need to be equitable and offer half of the pot; others offer a few dollars to avoid offending Player B. And those who are Player B will indeed decline the offer if it is too low, seeking some vengeance for the offense to their sense of fairness.

Unlike ultra-rational economic man, real humans are influenced by emotions and empathy.

“Positive reciprocity means that players are disposed to reward those who have helped them, even at a cost to themselves. In a typical trust game, one player has a pot of money, again typically around \$10, from which he can choose to keep some amount for himself, and to invest the remaining amount  $X$ , between \$0 and \$10, and their investment is tripled. A trustee then takes the amount  $3X$ , keeps as much as she wants, and returns  $Y$ . In standard theory terms, the investor-trustee contract is incomplete and the investor should fear trustee moral hazard. Self-interested trustees will keep everything ( $Y=0$ ) and self-interested investors who anticipate this will invest nothing ( $X=0$ ). In fact, in most experiments investors invest about half and trustees pay back a little less than the investment.  $Y$  varies positively with  $X$ , as if trustees feel an obligation to repay trust.”

- Camerer & Loewenstein, 2002

### **Behavioral economics in practice**

The defined contribution industry has begun to recognize the need to address participant behavior as defined by behavioral finance research. Innovations in plan structure and design that target issues such as inertia, paralysis of choice, and risk aversion are becoming more common among plan sponsors.

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Automatic enrollment solves for a number of different issues. By framing the option to enroll as the default, it instantly elevates that option as the more attractive, popular choice. Additionally, it helps to overcome participant inertia, requiring action only if they want to opt out of the plan.

The Pension Protection Act of 2006 identified several different types of qualified default investment alternatives for those plans implementing automatic enrollment. Notably absent were stable value or other capital preservation investment vehicles, which as stand-alone options may not provide sufficient appreciation to meet a participant's retirement goals. Instead, all of the qualified default investments are diversified investment mixes, such as balanced funds, risk-based funds, managed funds, or target-date funds. This measure has been successful in preventing participants' accounts from languishing in a stable value fund intended to be temporary for defaulted investors. It also combats risk aversion, making it likely that participant assets will be invested in a diversified mix that includes equities, whereas if left to their own devices, many participants will invest entirely in stable value in an effort to protect their principal.

However, there are disadvantages to these programs that remain to be addressed. For instance, setting a default contribution rate and default investment option can appear to participants as implicit advice, preventing them from choosing a higher contribution rate or a more appropriate investment selection. Automatic contribution increases can mitigate to some degree the tendency for participants to remain at the default contribution rate.

Communication programs are also shifting to accommodate behavioral tendencies. The recognition that participant actions are frequently based on emotional responses has engendered the use of proven marketing techniques and language in enrollment materials. Materials are just beginning to emerge that make considered decisions about how choices are framed and that focus on creating a stronger endowment effect (sense of ownership) to engage participants in their own planning process.

### Conclusion

The study of behavioral economics has produced a sea change in the way we understand people's financial decision-making. Since the shift from defined benefit to defined contribution plans as the main source of retirement savings for most American workers, plan sponsors have encountered difficulties in encouraging participants to save and invest wisely for the future. Now, with a greater understanding of the reasons for self-defeating behavior and the cognitive processes underlying decision-making, we have the opportunity to target participants' needs more effectively. While the industry has begun to innovate programs geared toward overcoming behavioral obstacles, there remain outstanding issues and unexplored avenues for improvement. The most important change is to foster plan sponsors' awareness of how participants are thinking so that plan decisions are effected with an eye toward how best to help them help themselves to reach their retirement goals.

Arnerich Massena will be publishing a follow-up article shortly to specifically address the issue of participant decision-making and plan design. We look forward to providing ongoing topics for discussion with your consultant and hope that both this paper and upcoming articles will serve to open a dialogue about how we can make use of this knowledge to help participants save for a secure retirement.

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### Endnotes:

Camerer, Colin F.: "The behavioral challenge to economics: Understanding normal people," Caltech; June 4, 2003

Camerer, Colin F. & Lowenstein, George: "Behavioral Economics: Past, Present, Future," Caltech and Carnegie-Mellon University; October 25, 2002

Choi, James J.; Laibson, David; Madrian, Brigitte C., Metrick, Andrew: "Optimal Defaults and Active Decisions" National Bureau of Economic Research; January 2005

Cook & Company: "Behavioral Economics & Decision-Making", Cook & Company Commentary; Summer 2004, [www.cookcompany.com](http://www.cookcompany.com)

Dalton, Patricio S.: "What have we learnt about Loss Aversion and Endowment Effects? Still an anomaly?" Warwick University; February 2003

Employee Benefits Research Institute (EBRI): 2009 Retirement Confidence Survey

Heukolom, Floris: "Who are the Behavioral Economists and what do they say?" University of Amsterdam and Tinbergen Institute; June 2006

Hutchison, T.W.: *The significance and basic postulates of economic theory*, London: Macmillan; 1938

Iyengar, Sheena S.; Jiang, Wei: "The Psychological Costs of Ever Increasing Choice: A Fallback to the Sure Bet" Columbia University, April 2005

John Hancock Financial Services: "Insight into Participant Investment Knowledge & Behavior," Eighth Defined Contribution Plan Survey; 2002

Kahneman, Daniel; Slovic, Paul; & Tversky, Amos: *Judgment under uncertainty: Heuristics and biases*, Cambridge University Press; 1982

Kolbert, Elizabeth: "What was I thinking: The latest reasoning about our irrational ways," *The New Yorker*; February 28, 2008

Lambert, Craig: "The Marketplace of Perceptions: Behavioral economics explains why we procrastinate, buy, borrow, and grab chocolate on the spur of the moment," *Harvard Magazine*; March-April 2006

Surowiecki, James: "Bitter Money and Christmas Clubs," *Forbes*; February 14, 2006

Tversky, Amos & Kahneman, Daniel: "Availability: A heuristic for judging frequency and probability," *Cognitive Psychology*; 1973

Tversky, Amos & Kahneman, Daniel: "Judgments of and by Representativeness," *Judgment under uncertainty: Heuristics and biases*, Cambridge University Press; 1982

Tversky, Amos & Kahneman, Daniel: "The Framing of Decisions and the Psychology of Choice," *Science*, Vol. 211; January 20, 1981