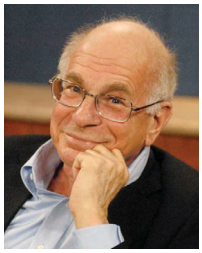
The Human Side of Decision Making

Thinking Things Through with Daniel Kahneman, PhD

Daniel Kahneman is widely considered the most influential psychologist in the world today. He is best known in the financial realm for pioneering work that helped to lay the foundation for behavioral economics, which studies the psychology of judgment and economic decision making and its impact on the financial markets. Together with his long-time collaborator Amos Tversky, Dr. Kahneman explored the ways in which human judgment systematically departs from the basic principles of decision theory when evaluating economic risk, consequently creating the concept of prospect theory. Their findings challenged fundamental economic assumptions and expanded the boundaries of research by introducing psychologically realistic models into economic theory. So ground-breaking are their discoveries that *New York Times* columnist David Brooks has called Drs. Kahneman and Tversky "the Lewis and Clark of the mind." In 2002, Dr. Kahneman's work was recognized with the Nobel Memorial Prize in Economic Sciences for his integration of insights from psychological research into economic science.



Daniel Kahneman, PhD

Born in Tel Aviv in 1934, Dr. Kahneman spent his childhood—including the period of the Nazi occupation (1940–1944)—in France before moving to British Palestine (now Israel) in 1948. In 1954, he earned a bachelor of science degree with a major in psychology and a minor in mathematics from The Hebrew University of Jerusalem, then joined the Israel Defense Forces, where he served in the psychology branch. His responsibilities included evaluating candidates for officer training school and developing a method for interviewing combat unit recruits, which much later provided some of the basic ideas of his work with Amos Tversky on judgment. According to Dr. Kahneman, "This was the beginning of a lifelong interest in the statistics of prediction and description." In 1958, he began PhD studies at the University of California, Berkeley. After completing a doctorate in psychology in 1961, Dr. Kahneman returned to The Hebrew University of Jerusalem as a lecturer in psychology; he was promoted to senior lecturer in 1966 and later to professor.

In 1969, Dr. Kahneman began his long collaboration with Dr. Tversky, a fellow psychology professor at The Hebrew University. Their first jointly authored paper, "Belief in the Law of Small Numbers," was published in 1971. Over the next thirteen years, Dr. Kahneman and Dr. Tversky worked together to produce a series of seminal articles in the field of judgment and decision making. Among the most important of these were "Judgment under Uncertainty: Heuristics and Biases," published in 1974 in *Science*, which introduced the idea of judgment heuristics, including anchoring; and "Prospect Theory: An Analysis of Decision under Risk," published in 1979 in *Econometrica*. In 1977, Dr. Kahneman and Dr. Tversky met Richard Thaler, who later became the leading figure in behavioral economics. Dr. Kahneman has called his friendship with Dr. Thaler "the second most important professional friendship" of his life. Dr. Kahneman and Dr. Tversky subsequently became involved in the development of this new approach to economic theory, eventually collaborating on several papers with Dr. Thaler.

In 1978, Dr. Kahneman moved to Vancouver to take a position as professor of psychology at the University of British Columbia. He continued to collaborate with Dr. Tversky, who had accepted a position at Stanford University the same year, and the two completed their study of framing over the next several years. Dr. Kahneman also collaborated with Dr. Thaler on a variety of topics that integrated psychology and economics, including the endowment effect and public views about fairness in economic transactions. From 1986 to 1993, Dr. Kahneman returned to the University of California, Berkeley, as professor of psychology. During the 1990s, Dr. Kahneman's research focus shifted to hedonic psychology—the study of what makes experiences and life pleasant or unpleasant, satisfying or unsatisfying—as well as to studies of well-being that built on his previous research about experienced utility. Recently he has been working to develop and promote adversarial collaboration within the social sciences. During the course of his academic career, Dr. Kahneman also has been associated with the University of Michigan, Harvard University, the Russell Sage Foundation, the Canadian Institute for Advanced Research, and the Applied Psychological Research Unit in Cambridge, England.

Since 1993, Dr. Kahneman has been associated with Princeton University, where he is the Eugene Higgins Professor of Psychology, Emeritus, and Professor of Psychology and Public Affairs, Emeritus; he is also a Senior Scholar at Princeton's Woodrow Wilson School of Public and International Affairs and a Fellow at the Center for Rationality at The Hebrew University of Jerusalem. Since 2004, he has served as a Gallup senior scientist, advising and consulting with Gallup researchers on behavioral economics and his recent research on psychological well-being. Dr. Kahneman

is a founding partner of The Greatest Good, a business and philanthropy consulting company formed with the goal of applying cutting-edge data analysis and economic methods to the most salient problems in business. He is a consultant to Guggenheim Partners, an investment advisory firm.

Dr. Kahneman has written and edited numerous books and authored more than 170 articles for professional journals. The 1974 *Science* paper and the 1979 *Econometrica* paper that he co-authored with Dr. Tversky are among the most frequently quoted works in social science; Dr. Kahneman himself was cited in scholarly journals more than 28,000 times between 1979 and 2011, according to the Thomson Reuters Web of Science data base. The Decision Analysis Society presented Dr. Kahneman with its Publication Award for the best paper published in 2003 for "Maps of Bounded Rationality: Psychology for Behavioral Economics." Dr. Kahneman's recent book, *Thinking, Fast and Slow* (2011), summarizes much of his research, is a bestseller, was selected as one of the best books of 2011 by the *New York Times Book Review*, the *Wall Street Journal*, the *Economist*, and Canada's *Globe and Mail*; and won the *Los Angeles Times* Book Prize.

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Dr. Kahneman has received every major award in the field of psychology, including the American Psychological Association's 2007 award for outstanding lifetime contributions to psychology and the University of Louisville's 2003 Grawemeyer Award in psychology (with Dr. Tversky) for revolutionizing the scientific study of decision making. In 2011, the American Economic Association named Dr. Kahneman as a distinguished fellow, *Bloomberg* named him as one of the fifty most influential people in global finance, and *Foreign Policy* magazine recognized him as one of the world's top global thinkers. In 2005, Dr. Kahneman was voted 101st among the 200 greatest Israelis of all time in a poll conducted by the Israeli news website Ynet. He has been awarded honorary doctorates by numerous universities including the University of Michigan, Erasmus University in the Netherlands, University of Paris, University of Milan, Harvard University, and The New School.

In February 2012, Dr. Kahneman spoke with members of the Editorial Advisory Board of the *Journal of Investment Consulting* about his investigations into decision making in the context of a dual-process model, loss aversion and risk tolerance, adversarial collaboration, and financial advisors' impact on investors' well-being. Taking part in the discussion were Margaret M. Towle, PhD, the *Journal* editor-in-chief, of HighTower Advisors; Mark Anson, PhD, of Oak Hill Investments; Edward Baker of The Cambridge Strategy; Geoffrey Gerber, PhD, of TWIN Capital Management; and Meir Statman, PhD, of Santa Clara University. This interview is the twelfth in the *Journal*'s Masters Series, which presents topical discussions with leading experts and visionaries in finance, economics, and investments.

Margaret Towle: First of all, Dr. Kahneman, thank you so much for agreeing to spend some time with us today. We're all well-acquainted with your exceptional background and contributions, and we hope to get a little more insight into the factors that helped to shape your career. Looking back over your experiences—from your childhood in Nazi-occupied France, your collaboration with Richard Thaler[1] in behavioral economics, through your recent work in intuition and the role that it plays in scientific investigation—what do you regard as the major factors that shaped your career and brought you to where you are today? Your accomplishments are too numerous to list, of course, but what do you consider your major achievements?

Daniel Kahneman: I think there's no question about the main determinant of my career, and that was the joint work with Amos Tversky.[2] As you know, most of my research has been collaborative. So having brilliant friends, I think, is the secret of any success I have achieved. In addition, there is a large element of being in the right place at the right time intellectually, that is, answering questions to which people are interested in hearing your answers. So, yes, I've been very fortunate. Clearly, if you want to understand what I've done, it's mostly collaborative.

Margaret Towle: What about on the other side, that is, what you would consider—I don't know if we want to call them mistakes—but your biggest disappointments in terms of events that happened throughout your career?

Daniel Kahneman: The worst thing that happened in my career was that, as I just mentioned, Amos Tversky and I collaborated for a long time, beginning in 1969, and then [in 1978] he went to Stanford University and I went to the University of British Columbia. We went on collaborating for a while after that, but it became very difficult for many reasons, mainly the physical separation. I think that together we were doing work that was better than either of us did separately. So the fact that we stopped working together was a major disappointment. I think I would have done better work if we had gone on working together, and probably so would he.

Meir Statman: In your most recent book, *Thinking, Fast and Slow*, you talk about the organizing principles of System 1 and System 2.[3] I was speaking some months ago to a group of wealthy investors and business owners, noting the need to check intuition by the rules of science. One of the participants said that he still trusts his gut much more than scientific evidence. How can we persuade people to check their intuition? And should we persuade people to check their intuition?

Daniel Kahneman: I don't know that you can persuade everybody. The confidence that people have in their intuitions is a genuine feeling; it is not an opinion. You have the immediate feeling that your thinking is right, that your intuitions are valid, and it's like something you see, an illusion. People are very resistant to changing their minds about their cognitive illusions. We're much more willing to accept visual illusions, but people really resist when you tell them that their thinking in a certain way is an illusion. It's very difficult to convince them. On the whole, the ideas of System 1 and System 2 are penetrating, that is, there is more and more readiness to accept them. However, it's slow, and when they conflict with people's direct intuition, you'll find they quite frequently lose.

Meir Statman: The people to whom I was speaking were members of families who had established very successful businesses. I was wondering whether their experience had involved one or two decisions that went spectacularly well, which persuaded them to believe in a version of the law of small numbers.[4]

Daniel Kahneman: Absolutely. It's very clear that it doesn't take very much for people to think that there is a pattern, and it doesn't take many successes for people to think that they are very, very smart, and it doesn't take many successes for others to think that a successful person has been very smart. People can be lucky, and that will feed into overconfidence. But even without luck, people are prone to overconfidence.

Ed Baker: I have a slightly different question, but related to that. I picked up on one comment you made in your Nobel Prize autobiography, which I found to be just fascinating. In particular, you said that most highly cognitive performances are intuitive. I wondered, when it comes to identifying skill, does that make it harder or easier? Is there something about this characteristic that one can identify, or is it really just unique from instance to instance? Is there a pattern that one can see?

Daniel Kahneman: What we call intuitive thinking refers to the ideas that come to mind quickly and without reflection, quite often automatically. You're in a situation, and you know what to do or you know how to understand that situation. Most of the time, our intuitions are just fine. We mostly run on what I call System 1 intuitively and with high confidence and very successfully. That is true both in very simple matters—for example, recognizing a speaker's emotion on the telephone from hearing one word, this is something at which all of us are quite skilled. Intuition is often excellent in complex tasks as well. We have learned hundreds of skills that actually are at the level of a chess master, except we don't think of them that way. When we get highly practiced, we develop skills. The problem with intuition and with people who want to trust their gut is that intuitions come with high confidence. The confidence is justified when intuition is a product of skill, which people have acquired through numerous experiences with immediate feedback. However, some intuitions are products of heuristics of judgment and are quite often mistaken.[5] The problem is that even the mistaken intuitions come to mind with considerable confidence. It's very difficult to distinguish between intuitions that reflect real skill and intuitions that don't. It is not easy for an observer, and even harder for the individual who has the intuition. We don't know the boundary between skill and heuristic in our own thinking.

Ed Baker: So that makes this type of behavior very difficult to distinguish, that is, when it's an example of skill and when it's not?

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Daniel Kahneman: In *Thinking, Fast and Slow*, I described my collaborative work with Gary Klein[6] on determining whether you can trust intuitive thinking. The conclusion is that if you want to know whether you can trust intuition, your own or somebody else's, you shouldn't ask about subjective confidence, because that can be very misleading. Instead, you should ask about the probability that a person's intuitions arise from genuine skill. For that, you have to look at whether the world is sufficiently regular to support skill, which is true for chess masters and for recognizing the emotion in your wife's voice but probably isn't true in the stock market. Second, you have to ask whether the individual has had sufficient practice to acquire this skill. So confidence is not it. You've got to look from the outside. When a person makes a judgment, you have to ask what are the probabilities that this judgment is well-founded given the nature of the world in which that individual operates and the nature of the practice that the individual has had.

Ed Baker: Interesting, but there certainly are contexts in which confidence plays a dominant role in success, for example, in a leadership setting.

Daniel Kahneman: Absolutely. We reward confident optimists. There is no question that, in the context of leadership, somebody with high confidence is more likely to inspire trust in others and is more likely to attract resources that are needed for success. Optimism also facilitates resiliency in the context of execution. However, we need to distinguish situations in which optimism and confidence are useful from situations in which they are not. Roughly speaking, confidence is

very useful in the context of execution, that is, when you are already committed to a course of action, you need to believe that you can do it. That will make you more resilient if things go badly, and thereby improve the real chances of success. If I have a favorite football team, I would like those players to be optimistic when they are on the field. In the context of decision making, however, I have absolutely no interest in my financial advisor being an optimist. I would like him to be as well-calibrated as possible.

Mark Anson: I've had experience working with pension funds over the years, and it's interesting to observe the group psychology and herding[7] that you see associated with large institutional investors. At least I've observed it from time to time with pension funds tending to move in the same direction at the same time. I noticed in your book that you talk about System 1 versus System 2 and the behavioral biases that can impact either of them. I was curious, from your point of view, do you find more behavioral bias embedded in a System 1 process versus a System 2? It seems like a System 2 process, which you refer to as a bit more analytical, might at times have the potential to be lazy and just accept what the rest of the herd is doing. Can you comment on that?

Daniel Kahneman: The way I analyze this in the book, most actions involve both systems. That is, System 1 quite often is the one that originates an idea or an impulse for an action. Then System 2 quite often endorses it, without checking sufficiently. That happens a great deal. In addition, System 2 quite often lacks the necessary knowledge. So you can slow yourself down, but mobilizing System 2 won't do anything for you if you don't have the tools to understand the situation. Slowing down is good when it allows you to deal with a situation more intelligently. Slowing down won't help when you are out of your depth.

Mark Anson: When people slow down, doesn't that tend to mean that they fall back in with the pack again, in that herding behavior that many have written about?

Daniel Kahneman: I'm not at all sure of that. I would attribute herding to a System 1 tendency. In situations of very high ambiguity, and when you have lost your confidence in your own ability to understand the world, then the tendency to do just what other people are doing is extremely powerful. It's also reinforced by social norms and by groups. If you see other pension funds doing something and you don't do it, you will get severely punished if you lose for not following the herd. So following the herd has an element of safety in it, and it's bound with System 1. I don't think of it as primarily a System 2 process. Herding is not necessarily something one does as the result of analysis. It is what one does when one's confidence is impaired.

Meir Statman: There are two areas that I hope you will not end this interview without addressing. One has to do with your work on well-being, and the other has to do with your work on fairness. Why do people with billions of dollars—hedge fund managers as one example—want even more money? I know what it does to their wealth, but what does it do to their well-being? Is it possible that a good part of what financial advisors do is increase investors' well-being while potentially diminishing their wealth?

Daniel Kahneman: Those are two very different questions, so I'll take them one at a time. We know from recent research that, beyond a certain income threshold, which is actually quite low—it's about $70,000 per household, emotional happiness doesn't seem to increase at all. Now, life satisfaction probably increases reasonably steadily with wealth. When people seek more wealth, although they will never spend what they already have, this is clearly because money is a proxy for something else. I mean, money is a proxy for ego satisfaction. So most of these people are in it because they need success, and money is just an index of success. That, I think, is the motivation for many people. Actually, I think the people who are strictly motivated by money rather than by success are mainly the poor and the very poor. For most of us professionals, money is a proxy for something else, and that is certainly true for hedge fund managers. So that's an answer to your first question.

Your second question is a very interesting one—what is the relationship between financial advising and the client's well-being? Actually, I've worked with that question before. In fact, with a well-respected investment advisory firm, Andrew Rosenfield[8] and I were involved in devising a program for advising very wealthy investors. There you're really more concerned with their well-being than with their wealth. Primarily you want to protect them from regret, you want to protect them from the emotions associated with very big losses. So you end up focusing more on their emotions than on their wealth.

Meir Statman: Can you give an example of how you might have done this?

Daniel Kahneman: That relates to another question, that is, how does one identify risk tolerance? Our thinking on this was that the issue is not so much tolerance for risk as it is tolerance for losses. Tolerance for losses means that you have to know—the individual investor has to know and certainly the advisor has to try to know—how much loss the person will be able to tolerate before he changes his mind about what he is doing. Clearly, changing course by and large is not a good idea, and selling low and buying high is not a good idea. You have to anticipate regret and identify the individuals who are very prone to regret. They're not going to be very good clients for the financial advisor. If people are very prone to regret, then you have to help them devise a plan that will minimize their regret. For the very wealthy, emotion is clearly important in determining what policy is appropriate.

Geoff Gerber: I remember hearing Amos Tversky present the findings of your collaborative research at a University of California, Berkeley, seminar on finance back in the early 1980s. He introduced the concept of loss aversion bias[9] that you're talking about, which, as you say, is the tendency to fear losses more than we value gains. The question from an investment manager's perspective or an investor's perspective is does the implementation of stop-loss limits[10] help alleviate the loss aversion bias?

Daniel Kahneman: The main question that I have found useful to ask when someone is very wealthy is how much loss is the individual willing to tolerate? That is, what fraction of their wealth are they actually willing to lose? It turns out that fraction is usually not very large. That's a very important parameter. How much do they really want to protect as much as possible, and how much are they willing to consider losing? That varies a lot among individuals. By and large, the very wealthy mostly want to protect their wealth, and they're willing to play with a small fraction of it. That is the fraction they are prepared to lose, but it's not a large fraction. So they're loss averse, not risk averse as such.

Geoff Gerber: So you're suggesting that setting a stop-loss higher or lower depends on your willingness to accept a loss? Is that a good approach?

Daniel Kahneman: For the individual who is very concerned about losses, I think this is certainly a good approach. That's the major question you want to ask the investor. How much are you willing to lose? Then you have to take steps so that they won't lose more than they are willing to lose. That's in effect stop-loss policy.

Ed Baker: Could you in fact organize questions that involve costs of insurance to see how much they'd be willing to pay for insurance that would protect against losses?

Daniel Kahneman: That's interesting. I hadn't thought of it that way—in terms of insurance. Yes, that would be an interesting approach. Also, people have to become aware of the fact that by stopping their losses, they are giving up some potential upside. Looking at the trade-off between the upside and the downside gives you a sense of their attitude toward losses and what you should encourage them to do.

Meir Statman: You mentioned that people are willing to play with or lose some portion of their money. I don't know if you have in mind that they keep two mental accounts: one is money that is not to be lost, and the other is money that can possibly be lost?

Daniel Kahneman: That is exactly what we have in mind. We actually had the individual construct two portfolios. One is a portfolio that is designed mainly for safety, and the other portfolio is designed to take advantage of opportunities. The relative size of the two portfolios represents one way of identifying loss aversion because with your riskier portfolio, that's an amount you can consider losing. It's not only two mental accounts. At least with some clients, we make this completely explicit, that is, clients receive information about two accounts, about their safe account and their riskier account. This is a very natural way for people to think.

Meir Statman: If I might move on to the issue of fairness, where you've done a lot of work, perhaps I can frame my question in the context of the fees that are charged by advisors. I think that financial advisors have more difficulty than other professionals, say physicians, lawyers, or accountants, in setting fees and justifying their fees. Advisors seem to be forever trying to hide their fees in one form or another. Can you speak to this issue of fairness?

Daniel Kahneman: Actually, this is a topic I haven't thought about, so I don't have a clear sense. In part, the need to hide fees comes from the fact that many of the advisors are frequently conflicted to some extent because if they're associated with a firm that provides products, then there is a problem associated with fees. Advisors who are completely hands-off, that is, those who are not involved with the products they are selling, probably should have no difficulties explaining their fees and charging for their services. It's those who are in a more ambiguous position who are probably sensitive about their fees. I haven't seen much discussion of the fairness of fees because clearly this is a competitive market, and there is enough variability in the fees for individuals to make their own choices.

Ed Baker: Moving on to a different area, I was interested in asking about your new work in adversarial collaboration.[11] I found that to be a fascinating turn of events in your life. What motivated that? Have you found some interesting opportunities to do new creative work? How can this be applied? It seems that if you could develop some systematic rules, it could be a major breakthrough in the way negotiations work. I'm thinking, of course, in the area of government.

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Daniel Kahneman: I got into adversarial collaboration because there is a system in the scholarly literature where people critique other people's writings, and then there is a reply, and then there is a rejoinder. That's the routine in scientific publications. I was just very struck by how totally wasteful this is, because in all these exchanges nobody admits to having made an error. It is very striking, and quite frequently it becomes an exercise in sarcasm. It's just foul actually. So having been involved in some controversy, I became very interested in the possibility of trying to meet people who don't agree with me. All of us have a shared commitment to science, and we—at least in principle—also have a shared commitment to truth. That gives us some basis for working together to achieve truth. Now it turns out that even among scientists, the commitment to truth is—well, it's a real commitment—but emotion comes in. One of the striking things about adversarial collaboration—and I've had several—is that at the end of the collaboration, nobody feels that he has changed his mind much. That's very typical.

You asked whether adversarial collaboration could be implemented in politics. The question is whether there is enough of a shared commitment, a shared goal, for people to be interested in searching for compromise or in searching for joint action. This clearly exists among scientists, but it's much less likely to exist among true adversaries in the political domain, except possibly in a situation of crisis when it would become natural for adversaries to collaborate. I'm not very optimistic that adversarial collaboration can generally be extended to areas other than science. I've had luck with it. I've had good experiences with adversarial collaboration, I've avoided lifelong quarrels, and I have made friends. In sum, my experience has been a good one, but adversarial collaboration takes a lot of time and a lot of patience. It also sometimes takes quite a bit of self-control not to lose your temper with somebody who seems stuck on refusing to see the truth as you see it. So it's a mixed bag of experiences, and I'm not sure how far it can go beyond science.

Let me add that there are two practices that quite probably can advance or spread beyond science. One is, almost as a technique, to encourage adversaries to take each other's point of view and to make a speech that is, as it were, for the other side. That induces empathy, and it really helps you to understand what the other side is doing. That's a very worthwhile exercise if you're really interested in advancing cooperation. The other practice that seems really useful is socializing. I think one of the disasters in Washington is that apparently there is now very little socializing across political parties, whereas thirty or forty years ago, it was a rule that adversaries would drink and smoke together and go to football games together and so on. That is enormously important to mitigate adversarial relations, and we don't have that now.

Meir Statman: In politics, persuasion is the thing. It's less a matter of finding the truth than getting people to vote for you. I think there is an equivalent of that in the financial services industry, exploiting cognitive errors rather than countering them. For example, we see advertising that magnifies people's overconfidence in their ability to beat the market, rather than tamp it down. Can you speak to that?

Daniel Kahneman: Obviously, there is a lot of pandering to System 1 in advertising. I don't know if you have in mind the ads that encourage you to trade so as to beat the market and become rich. Those ads are clearly directed at overconfident people, and are intended to enhance their overconfidence. Most of advertisement is addressed to System 1, not to System 2. There is very little information in advertising, and anybody who watches programs with loads of advertising, such as the Super Bowl for example, would be hard put to find any information about any product. It is very striking—there is none. It's all appealing to different types of emotions.

Meir Statman: By one reliable estimate, U.S. investors would save more than $100 billion each year if they switched to low-cost index funds. Why aren't more investors using index funds? Why aren't they more sensitive to the fees involved?

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Daniel Kahneman: I think that most people believe they are in the market to beat the market. If they are planning to beat the market, they are willing to pay some price. If, in your imagination, you're going to beat the market by a lot, then you become insensitive to fees. In order to become sensitive to fees, it's almost a precondition to accept that you're very unlikely to beat the market systematically, and that's a difficult realization for many investors. That relates to the other question of why aren't all investors in index funds. Clearly, there has been an increase in the amount of money invested in index funds, but I read the statistic of 25 percent of assets somewhere. Is that correct?

Meir Statman: At most, I would say.

Daniel Kahneman: This is clearly overconfidence at work, and to some extent the people who are selling these services are themselves overconfident. I had a marvelous experience many years ago with a financial advisor, whom I actually left—well, I had already left him when we had this conversation. I had moved to a safer line of investments, and he called me and said: "Look, what you are doing is stupid. We could make a lot of money for you. You are limiting your gains to a fixed amount, and last year we had several funds that did so much better than that amount." Then I looked back at the letter he had written me a year earlier in which he recommended specific funds. None of the funds he had recommended was among those that actually made a lot of money a year later. But he didn't know it. He had no interest in lying to me, because I had already left him and he knew I wasn't coming back. He was fighting for his own overconfidence. I think there's much more sincere overconfidence than lying among the professionals who think they can beat the market, and so they convince investors, and investors think, "Here is a guy with a track record of five winning years," and off they go.

Meir Statman: Obviously, cognitive errors get in the way, because the financial services industry is a great puzzle. In a world where people are smart—even if not rational—all would move on to index funds. The question I come back to is the question of well-being. Is it possible that we underes-

timate the joy that people derive from attempts to beat the market? Or that we underestimate the desire for the hope of getting rich through their investments?

Daniel Kahneman: I see the question you are raising, and it's a very interesting one. Clearly when people go to Las Vegas to gamble, most of them are not going to get rich, and they know that they are more likely to lose than to win, but they are going for the entertainment and the excitement and the thrill and the possibility of winning. Whether people who are investing think of it as going to Las Vegas, I personally doubt it very much. I don't think it's the same thing. They don't know that they're gambling—they think they're playing a game of skill.

Ed Baker: However, there are examples such as Warren Buffett,[12] and people see someone like that apparently making money consistently. Do they just misassess the probability of winning? Is that really what's going on?

Daniel Kahneman: I think so. Clearly from the examples you see or read about, there are successful people. If you went by the proportion of successful and unsuccessful people that you see in the media or that you hear talked about, then success overwhelms failure. Anybody who relies on what we call the availability heuristic[13] is going to find support for his overconfidence. That's overconfidence, not a search for well-being. The few who are in the market for the sheer excitement of it probably gamble small amounts, and know that they are in Las Vegas.

Meir Statman: Perhaps, but if you ask people who drive a Lexus or Rolls Royce if they do it for status, they would surely deny it. They would say it's because of the car's high quality and so on. I wonder if investors lack introspection about their wants.

Daniel Kahneman: To some extent, I think you are right. There are two separate questions. First, do people know the odds? The best evidence suggests that they don't know the odds, but they are truly optimistic about the likelihood of their winning. Second, when they play, when they are in the market, do they by and large derive well-being from it? Well, that's a complicated question, because if somebody is more sensitive to losses than to gains, then they don't get much well-being from the winning and losing. They get some excitement, and they quite possibly are deluded about how much they are winning and losing. That is, people have selective memories for their successes and failures, and they may actually misremember their previous record and think that it is better than it really was.

Margaret Towle: It's similar to 2008. When you ask people, nobody lost any money then.

Meir Statman: I lost money, I can assure you.

Margaret Towle: We've covered a wide range of topics so far today, Dr. Kahneman, but are there other areas of interest that you think are especially relevant when it comes to the investment industry as far as potential areas of research or areas that are unexplored now, given your conceptual framework?

Daniel Kahneman: Of course, there are many questions about the future, the future of research, and so on. I don't believe in long-run forecasting, and I don't believe that you can say the field is going in one direction or another. I have very little to say about where the field is going. Short-term, you can tell there is going to be more neuro-economics—that's fairly clear, because so many bright students are going into that field. The role of emotion in decision making is going to be discussed, and there's going to be more of it in the near future. Long-term, who knows?

Meir Statman: One sentence in *Thinking, Fast and Slow* that struck and delighted me was one where you said that you cringe when you hear people say that Amos Tversky and you proved that people are irrational. Could you elaborate on that? What is your sense of rationality? What does irrationality mean to you? I know that I have been using the term "normal" to define the opposite of rational.

Daniel Kahneman: I'm delighted with that question, and I'm actually very pleased to talk about that. The word rational[14] for me is a technical term. Rationality is defined in decision theory[15] as logical coherence, and it's very easy to test. In fact, a significant amount of research—and the research done by Amos and me, specifically—was dedicated to showing that people are not rational by that definition. But to call people irrational makes me cringe because the meaning of irrationality is associated for most people with emotion, with impulsivity, with frothing at the mouth. Our research was concerned with cognitive biases; we did not deal with mistakes that people make that arise from emotional impulsivity. As I understand the word, what we studied was not irrationality. I see a lot of System 1 influence, and System 1 is the emotional one, but I don't see all that much irrationality.

Ed Baker: On the other hand, you've resisted defining rationality, you said. If you were forced to come up with a definition, what would it be?

Daniel Kahneman: I think I just defined it. I accept the definition of rationality as a technical term. I don't use the word rationality except as that technical term. I don't say people are irrational. I speak of reasonableness, I follow Richard Thaler in talking about Econs[16] versus Humans, and I think Meir's use of normal is the same general idea. I just don't use the word much, except in its technical meaning. The so-called rational agent[17] hypothesis is outlandish and completely implausible. No finite mind could satisfy the requirement of rationality. The bottom line is that I don't need to define rationality, because it's defined as a technical term.

Ed Baker: Is there some underlying condition, though, that leads to efficient markets?

Daniel Kahneman: I don't know enough economics to answer that question. I could quote second-hand or third-hand that it doesn't take many rational agents to have enough money to enforce market discipline and so on. But I don't really know enough.

Meir Statman: Can you elaborate on what you said in your book about prospect theory?[18] You noted what pros-

pect theory did to counter expected utility theory,[19] but you also pointed out the shortcomings of prospect theory in being true to reality. I'm not sure if I'm quoting it correctly, but I have this quote in my mind from Amos Tversky that "elegance is for tailors."[20]

Daniel Kahneman: Amos attributed that quote to Albert Einstein. I don't know if he was right—I never checked.

Meir Statman: Any quote where we don't know the source, we attribute to either [John Maynard] Keynes[21] or Einstein. In any event, would you comment on the fascination we have with higher mathematics and formal models and the field's direction in terms of how it expresses itself? I know you don't forecast long-term, but perhaps short-term?

Daniel Kahneman: Clearly, people who know mathematics have an advantage over people who don't, because they speak a language that others don't understand, whereas psychologists, sociologists, and people in professions such as that—most of the social scientists—speak in a language that, even if they use a little jargon, everybody can understand. So mathematics is an exclusive club, and there is a certain pride in belonging to it. It creates a mystique, and those who belong probably get a little more respect than they deserve. On the other hand, I have seen examples where clear mathematical thinking really improves the quality of psychological theory. Amos Tversky was a master at it. He could use mathematics to think better. That's not true of all mathematical psychologists, but Amos really used mathematics to make himself think more clearly. There are other examples as well. In behavioral finance, for example, we have the demonstrations by Nicholas Barberis[22] of Yale University that one needs not only loss aversion but also narrow framing[23] in order to explain the behavior of individuals in the market. That was mathematical reasoning. It can be very fruitful when used in conjunction with good psychological intuition, so it is a very powerful tool.

> "I was just very struck by how totally wasteful this is, because in all these exchanges nobody admits to having made an error. It is very striking, and quite frequently it becomes an exercise in sarcasm."

Margaret Towle: We're nearing the end of our time, Dr. Kahneman, so I'll ask you if there's anything we haven't covered that you'd like to discuss.

Daniel Kahneman: No, we have covered more than I know.

Margaret Towle: Well, that's due to collective intelligence, I think, as far as the great questions that the group asked.

Ed Baker: I have one final question as to whether you have any thoughts for the regulators. Could any of your more recent work in behavioral finance, in particular, be helpful in forming market regulation?

Daniel Kahneman: I think there is no question about that. There are direct implications of behavioral economics and of the idea of bounded rationality[24] for regulation. The idea of the rational agent model has two pernicious consequences. One is that you don't need to protect consumers from themselves because they are rational, and therefore can be trusted to make the choices that are best for them. So you can oppose Social Security on the dual assumptions that people are rational and that they should bear the consequences of their actions. However, I believe that regulation is essential to protect people from predictable mistakes. You have to do that without abridging freedom, of course, but that can be done. And then you need to protect consumers from actors in the market that would deliberately exploit people's ignorance and their intellectual sloth.

Margaret Towle: This has been a most interesting discussion. We really appreciate your taking the time to share your views and talk with us. Thank you, Dr. Kahneman.

Daniel Kahneman: Thank you.

Endnotes

1. Richard H. Thaler (1945–) is an economist and professor of behavioral science and economics at The University of Chicago Booth School of Business. He is best known as a pioneering theorist in behavioral finance and for his collaboration with Daniel Kahneman and others in further defining the field of behavioral economics and finance.
2. Amos Tversky (1937–1996) was a cognitive and mathematical psychologist, a key figure in the discovery of systematic human cognitive bias and handling of risk, and a longtime collaborator of Daniel Kahneman. Their early work together focused on the psychology of prediction and probability judgment. The two went on to develop prospect theory, which endeavors to explain irrational human economic choices and is considered one of the seminal works of behavioral economics. Six years after Tversky's death, Dr. Kahneman received the 2002 Nobel Memorial Prize in Economic Sciences for the work he did in collaboration with Tversky. (The prize is not awarded posthumously.) Kahneman told the *New York Times* in an interview soon after receiving the honor (November 5, 2002): "I feel it is a joint prize. We were twinned for more than a decade."
3. In psychology, dual process theory is used to explain how a phenomenon can occur in two different ways or as a result of two different processes (and in various mixtures of the two): an implicit (or automatic) unconscious process and an explicit (or controlled) conscious process. Daniel Kahneman further differentiated these two styles of processing as System 1 and System 2. System 1 (or intuition) is rapid, automatic, and effortless, usually with strong emotional bonds included in the reasoning process. System 2 (or reasoning) is slower, deliberate, and subject to conscious judgments and attitudes.
4. The law of small numbers describes the judgmental bias that can occur when an assumption is made that the characteristics of a sample population can be estimated from a small number of observations or data points.

[5] Heuristics of judgment are principles or methods used to potentially simplify assessments or judgments of probability. In psychology, heuristics are simple, efficient rules, hard-coded by evolutionary processes or learned, that are used to explain how people make decisions and solve problems, usually when facing complex situations or incomplete information. Although these rules work well under most circumstances, they can lead to systematic errors or cognitive biases. Examples of heuristics of judgment include representativeness, availability, and anchoring.

[6] Gary A. Klein (1944–) is a research psychologist noted for pioneering the field of naturalistic decision making, focusing on the ability of intuition to support human decision making in high-pressure circumstances, such as firefighting and medical emergencies.

[7] Herding describes the phenomenon of individuals in a group unconsciously acting together without planned direction.

[8] Andrew Rosenfield, an economist and attorney, is managing partner of Guggenheim Partners, a financial services firm that provides wealth and investment management services to high-net-worth clients, foundations, and endowments. He also is managing partner and chief executive officer of The Greatest Good.

[9] In economics and decision theory, loss aversion bias is a form of cognitive bias that describes the tendency to strongly prefer avoiding losses to acquiring gains. Studies suggest that losses are twice as powerful psychologically as gains. Loss aversion was first convincingly demonstrated by Amos Tversky and Daniel Kahneman.

[10] Stop-loss limits are orders placed with a broker to sell a security when it reaches a certain price. A stop-loss order is designed to limit an investor's loss on a security position in advance, minimizing emotional decision making.

[11] Adversarial collaboration is described as "a good-faith effort by unlike minds to conduct joint research, critiquing each other in the service of an ideal of truth to which both can contribute" on Dr. Kahneman's TED speaker page, http://www.ted.com/speakers/daniel_kahneman.html.

[12] Warren Buffett (1930–) is an American investor, philanthropist, and chairman and chief executive officer of Berkshire Hathaway. Often referred to as "the oracle of Omaha," he was ranked by *Forbes* as the third-wealthiest person in the world, with a net worth of $44 billion, in March 2012.

[13] The availability heuristic is a thought process that uses the ease with which examples come to mind, or knowledge that is readily available, to make judgments about the probability of events. This can result in a cognitive bias because the frequency with which examples come to mind does not accurately reflect their actual probability.

[14] In psychology, the term rational is used to denote the use of conscious thought processes to solve problems.

[15] Decision theory involves identifying the values, uncertainties, and other issues relevant to decision making. By outlining a set of alternatives and their potential consequences, decision theory can be used to help individuals make better-informed decisions.

[16] Econs, a term coined by Richard Thaler, are the imaginary efficient individuals found only in economic theory who are able to weigh multiple options, forecast the consequences of each, and make logical choices, as opposed to actual humans, who are illogical, prone to generalize, biased in favor of the status quo, and more concerned with avoiding loss than making gains.

[17] In economics and decision theory, a rational agent, which can include individuals, companies, or computer programs, has clear preferences, models uncertainty using expected values, and always chooses to perform the action that results in the optimal outcome for itself from among all feasible actions.

[18] Prospect theory describes the ways in which individuals make choices among probabilistic alternatives that involve risk or uncertainty and evaluate potential losses and gains. Prospect theory, which attempts to model real-life choices rather than optimal decisions, holds that individuals make decisions based on the potential value of losses and gains (loss aversion) rather than the final outcome. The theory was developed by Daniel Kahneman and Amos Tversky in 1979 as a psychologically more accurate description of preferences versus expected utility theory.

[19] In decision making, expected utility theory, which is based on elementary rules of rationality, addresses the analysis of choices among risky or uncertain prospects by measuring the value of various outcomes relative to respective probabilities, with the focus on the final outcome.

[20] "If you are out to describe the truth, leave elegance to the tailor." Attributed to Albert Einstein (1879–1955) as well as to Ludwig Boltzmann (1844–1906), an Austrian physicist noted for advocating for atomic theory at a time when it was still controversial.

[21] John Maynard Keynes (1883–1946) was a world-renowned British economist whose ideas, known as Keynesian economics, had a major impact on theories of modern economics and politics as well as on government fiscal policies.

[22] Nicholas C. Barberis (1971–) is a professor of finance at the Yale School of Management, where his research focuses on behavioral finance, specifically using cognitive psychology to understand the pricing of financial assets.

[23] Framing refers to the context in which a decision is made. An investor is said to use narrow framing when he makes an investment decision without considering the context of his total portfolio. Together, narrow framing and loss aversion may provide a method for understanding how individuals evaluate stock market risk by examining their evaluation of risk in experimental settings.

[24] In decision making, bounded rationality holds that the rationality of individuals is limited by the information they possess, their cognitive limitations, and the finite amount of time available to make a decision. Economic models typically assume that the average person is rational and will, in large enough numbers, act according to preferences. The concept of bounded rationality revises this assumption to account for the fact that perfectly rational decisions are, in practice, often unfeasible because of the finite computational resources available for making them. Daniel Kahneman has proposed bounded rationality as a model to overcome some of the limitations of the rational agent model in economic literature.

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