

Psychological Science

<http://pss.sagepub.com/>

The Great Rationality Debate

Philip E. Tetlock and Barbara A. Mellers

Psychological Science 2002 13: 94

DOI: 10.1111/1467-9280.00418

The online version of this article can be found at:

<http://pss.sagepub.com/content/13/1/94>

Published by:



<http://www.sagepublications.com>

On behalf of:



[Association for Psychological Science](#)

Additional services and information for *Psychological Science* can be found at:

Email Alerts: <http://pss.sagepub.com/cgi/alerts>

Subscriptions: <http://pss.sagepub.com/subscriptions>

Reprints: <http://www.sagepub.com/journalsReprints.nav>

Permissions: <http://www.sagepub.com/journalsPermissions.nav>

>> [Version of Record](#) - Jan 1, 2002

[What is This?](#)

Feature Review

THE GREAT RATIONALITY DEBATE

Philip E. Tetlock and Barbara A. Mellers

The Ohio State University

For better or for worse, and opinions are divided on this score, the research program of Daniel Kahneman and the late Amos Tversky now represents psychology's leading intellectual export to the wider academic world. Scholars with little else in common, from such far-flung fields as medical diagnosis, the law, public opinion, international relations, and microeconomics, share some working knowledge of the principles that Kahneman and Tversky have invoked to explain why people stray from classic benchmarks of rationality for judgment and choice: principles such as heuristics, framing, mental accounting, and the psychophysics of gain, loss, and probability-weighting functions (Dawes, 1998; Kagel & Roth, 1995; Mellers, Schwartz, & Cooke, 1998; Sunstein, 2000).

Choice, Values, and Frames begins with an account of the birth of prospect theory. Kahneman and Tversky had already established an intellectually intimate working relationship in their joint research on heuristics and biases. Kahneman recalls:

Our method of research in those early Jerusalem days was pure fun. We (Danny and Amos) would meet every afternoon for several hours which we spent inventing interesting pairs of gambles and observing our own intuitive preferences. If we agreed on the same choice, we provisionally assumed it was characteristic of human kind and went on to investigate its theoretical implications, leaving serious verification for later . . . In a few giddy months we raced through more than twenty diverse theoretical formulations. (p. x)

Kahneman and Tversky are hardly the first psychologists to use themselves as introspective guinea pigs. Fechner, Wundt, and James did it too. What is remarkable, though, is the impact of a few pivotal ideas that, we suspect, will enjoy positions of prominence when histories of behavioral science are written in the next century. We attribute the impact to two principal causes: the empirical rickety of the rational-choice paradigm that dominates much of social science and the inventiveness of Kahneman and Tversky not only in exposing empirical violations of rational choice, but also in proposing precise and parsimonious alternatives.

Many psychologists will find it difficult to appreciate the tenacious grip that rational-choice theory holds over economics. To many economists, rationality is a self-evident truth; anyone foolhardy enough to promote a counterhypothesis carries a deservedly heavy burden of proof. Kahneman and Tversky adopted a methodical strategy of subverting this theoretical colossus. They chipped away at it by carefully documenting how people violated one bedrock normative assumption after another. Kahneman and Tversky never strayed from the reigning utilitarian framework that treats choice between gambles as the prototype for decisions. Their goal was "to provide a descriptive account of everything we knew about a severely restricted class of decisions: Choices between simple monetary gambles with objectively specified probabilities and at most two non-zero outcomes" (p. x). It took 13

Choice, Values, and Frames, edited by Daniel Kahneman and Amos Tversky. New York: Cambridge University Press, 2000. 840 pages. Cloth, \$110.00; paper, \$39.95.

years to extend their original account, prospect theory, to cover gambles with more than two nonzero outcomes in cumulative prospect theory.

This style of rigorous incrementalism helps explain how Kahneman and Tversky managed to have as much influence as they do within a field such as economics, which fits the classic philosophy-of-science definition of paradigm (Suppe, 1977). But it does not explain the impact elsewhere. Here, some role must be acknowledged for the unfashionable concept of genius. Kahneman and Tversky had a flair for conjuring up cases in which intuitive powers of reasoning diverge from formal standards of rationality that, on reflection, most of us say we embrace. As the frequent allusions—by both admirers and detractors—to cognitive illusions suggest, there is something magical about the Kahneman-Tversky research program. But what exactly is it?

The magic is captured, in part, by the analogy between perceptual and cognitive illusions. The Müller-Lyer illusion remains compelling even after one pulls out a ruler and confirms that the two lines are equal. They still look unequal, and one is left with a queasy feeling of self-contradiction. Automatic perceptual processes point toward one conclusion; more self-reflective, higher-order mental processes point toward another. Something strikingly similar occurs when one confronts the thought experiments crafted by Kahneman and Tversky. The magic inheres in their ability to pinpoint sharp ontological break points in human phenomenology that have no meaningful equivalents in formal models of rationality. Key properties of the world that formal models treat as seamlessly continuous are perceived by ordinary people as sharply discontinuous. It is instructive to itemize several breakpoints and the resulting anomalies from a rational-choice perspective.

CHANGES VERSUS STATES

Expected-utility theory assumes that people should evaluate monetary outcomes of risky prospects as final states of wealth. The relative attractiveness of gambles should not flip as a function of whether people are presented with the prospects of gains or losses relative to the status quo. Kahneman recognized that this guiding assumption had to be wrong: Absolute states of wealth could not be the carriers of utility. It flies in the face of what psychologists have long known: The human perceptual system is fine-tuned to detect change from the status quo. For monetary outcomes, the status quo is the reference point that demarcates gains from losses.

GAINS VERSUS LOSSES

People focus on change, but not all changes are alike. The value function of prospect theory—which relates change in objective wealth

Address correspondence to Philip E. Tetlock, Department of Psychology, The Ohio State University, 1885 Neil Ave., 142 Townshend Hall, Columbus, OH 43210; e-mail: tetlock.1@osu.edu or mellers.1@osu.edu.

to change in subjective valuation—makes two critical distinctions. First, consistent with well-established psychophysical laws, the value function exhibits diminishing marginal sensitivity to change: hence, the familiar S-shape, concave for gains and convex for losses. Second, consistent with the intuition that losses can be fatal but forgone gains can usually be tolerated, the value function slopes down more rapidly for losses than it rises for gains. People are loss averse. The pain of a loss exceeds the pleasure of an equivalent gain.

Several chapters in *Choice, Values, and Frames* illustrate the explanatory power of these core tenets. Kahneman, Knetsch, and Thaler use them to explain endowment effects. In a typical experiment, participants are randomly assigned to the role of the seller or the buyer. Those who are sellers receive a gift such as a coffee mug, and those who are buyers are given an opportunity to purchase the endowed object. Sellers are asked to state the minimum amount they would be willing to accept to sell the mug (i.e., selling prices). Buyers are asked to state the maximum they would be willing to pay for the mug (i.e., buying prices). Because buyers and sellers are determined randomly, there is no reason to suppose that sellers value the mugs more than buyers. Experiments show, however, that few mugs are exchanged. The reason is simple: Selling prices dwarf buying prices, usually by a factor of 2 or more. The robustness of the effect is underscored by Bateman, Munro, Rhodes, Starmer, and Sugden, who document the same pattern with eight methods of preference elicitation.

Applications of reference points and loss aversion are not confined to the laboratory. Johnson, Hershey, Meszaros, and Kunreuther compare automobile-insurance purchases in New Jersey and Pennsylvania. In New Jersey, the default coverage excluded the right to sue, although drivers could buy that right at additional cost. In Pennsylvania, the default included this right, although drivers could decline it and reduce costs. This difference in the status quo was consequential: Seventy-five percent of Pennsylvania drivers, but only 20% of New Jersey drivers, purchased the right to sue.

In another field study, Camerer, Babcock, Loewenstein, and Thaler examined how New York cab drivers decide how long to work on a given day. Economic rationality suggests that cab drivers should work fewer hours on slow days and make up the shortfall on good days. But cabbies frequently do the opposite. They set a target income that serves as a reference point for daily earnings. When they reach their target, they quit. This rule leads drivers to work unnecessarily long hours on slow days and forgo easy income on good days.

Cohen and Knetsch note how reference points and loss aversion are woven deep into common law. Oliver Wendell Holmes sounded like a proto-prospect theorist when he wrote:

It is in the nature of man's mind. A thing which you have enjoyed and used as your own for a long time, whether property or an opinion, takes root into your being and cannot be torn away without your resenting the act and trying to defend yourself . . . The law can ask no better justification than the deepest instincts of man. (Holmes, 1897, as cited by Cohen and Knetsch, p. 432)

ONE VERSUS SEVERAL ACCOUNTS

In behavioral economics, mental accounting refers to how people organize, evaluate, and monitor financial activities. Rather than pooling all assets into a comprehensive account, people compartmentalize their resources into discrete qualitative accounts linked to different missions in life. It makes a difference to people whether they lost a \$20 ticket to the theater or \$20 in cash when they are deciding whether still to attend the show. And it makes a difference whether a \$5 savings

comes from a small purchase (such as a radio) or a large purchase (such as a car) when people decide whether to drive to another store to get the discount. These breakdowns in fungibility make no sense in rational-choice theory. But, as Thaler points out, they are readily explained with mental accounts.

Mental accounts can also have powerful effects on investment decisions. Closing an account in the red can be painful. Odean notes that when investors sell stocks, they must declare either gains or losses. Declaring a loss and closing an account feels worse than keeping the account open in the form of a paper loss. To avoid this pain, investors tend to sell winners and cling to losers. Odean found exactly this pattern in data from a large brokerage.

NARROW VERSUS BROAD BRACKETING

Benartzi and Thaler ask why people hold onto bonds, even though stocks have outperformed bonds by a massive margin for more than a century. Although rational-choice theory has long recognized risk-return trade-offs, the magnitude of the equity premium is widely conceded to be puzzling. Benartzi and Thaler posit that the magnitude of investors' loss aversion depends on the frequency with which they reset their reference point (or count their money). They ask: How often must investors evaluate changes in their portfolios to be indifferent between historical returns on stocks and bonds? The answer is 13 months. If the most prominent evaluation period is a year, prospect theory solves the equity-premium puzzle. A heightened sensitivity to losses and a prudent tendency to monitor one's wealth makes people demand a high premium to accept the psychological roller-coaster ride of stock valuations.

Myopic loss aversion illustrates a general phenomenon that Kahneman and Lovallo call narrow bracketing: a tendency to evaluate one project at a time, rather than an overall portfolio. Thaler illustrates narrow framing with an executive-education story in which he asked a group of executives, each of whom was responsible for a different division of the same large firm, whether they would undertake a project with a 50% chance to gain \$2 million and a 50% chance to lose \$1 million. Only 3 of the 25 managers accepted the gamble. Thaler then asked the chief executive officer of the firm whether he wanted a portfolio of 25 of these investments, and he nodded enthusiastically. Kahneman and Ritov document the power of narrow bracketing in another context: contingent valuation surveys designed to assess the value that people place on public goods such as clean air or endangered species. Respondents often exhibit massive insensitivity to the scope of proposals. In one case, respondents who were asked how much they would spend to clean up polluted lakes in a small region of Ontario were willing to spend the same amount as other respondents who were asked how much they would spend to clean up polluted lakes in all of Ontario.

INSIDE VERSUS OUTSIDE VIEWS

Kahneman and Tversky draw a sharp distinction between two modes of forecasting. Inside forecasts are generated by focusing on the case at hand, by considering the intentions of the key players and the obstacles to achieving their goals, and by extrapolating trends and constructing scenarios. The inside view is unrepentantly idiographic, anchored in a detailed understanding of the particular. The outside view is adamantly nomothetic: It ignores the details of the case at hand, and focuses on classificatory variables with demonstrable predictive power.

The Great Rationality Debate

Kahneman and Lovallo mince no words: "It should be obvious that when both methods are applied with equal intelligence and skill, the outside view is much more likely to yield a realistic estimate" (p. 406). Nonetheless, people overwhelmingly prefer the inside perspective and, once in that mind-set, often become ensnared in scenario thinking that makes it all too easy to mobilize support for far-out predictions. The more ideational momentum that people can generate for anticipating outcomes with low base-rate probabilities, the greater the risk of overconfidence. Camerer and Lovallo show just how treacherous inside views can be in their analysis of the excess entry of entrepreneurs into competitive markets. Entrepreneurs are often far more optimistic about their prospects for success than actual base rates suggest they should be.

STABLE VERSUS CONSTRUCTED PREFERENCES

Rationality requires stable and consistent preferences. Rational decision makers know what they want and simply pluck the highest-ranking option from a master list. The alternative view—as developed in the chapters by Slovic; Fischhoff; Fox and Tversky; Tversky and Simonson; Tversky, Sattath, and Slovic; and Hsee—holds that preferences are constructed on the spot by adaptive decision makers who use whatever cues are readily available. These constructed preferences are influenced by a host of normatively irrelevant factors. Hsee, for example, shows how preferences can reverse when an option is evaluated either jointly with another option or separately. Imagine a student who wants a secondhand music dictionary and is considering one that has 10,000 entries and looks like new and another that has 20,000 entries but has a large tear in the cover. Evaluating the dictionaries separately, participants prefer the smaller dictionary. But evaluating them jointly, people prefer the larger dictionary. Some factors become salient only in comparative context.

One way of constructing preferences is by justifying them. Shafir, Simonson, and Tversky create settings in which people resolve decisional conflicts by searching for reasons to explain their choices. Consider the disjunction effect, a violation of the sure-thing principle of rationality. Students are asked to imagine that they have just taken a tough exam and want a vacation, either to reward themselves if they pass or to console themselves if they fail. Most students do not hesitate to purchase a special-discount fare when the outcome is known. However, when the outcome is not yet known, students pay to delay the decision. Odd though it sounds, they do not yet have the raw reason material they need to justify making a decision one way or the other.

LINEAR VERSUS NONLINEAR DECISION WEIGHTING

The expectation principle of rational choice posits a linear response to variations in probability. This principle leads, however, to a form of Allais's paradox. If you prefer a lottery ticket with a 20% chance of winning \$4,000 over one with a 25% chance of winning \$3,200, you should also prefer a lottery ticket with an 80% chance of \$4,000 over one that guarantees \$3,200. The prediction follows because, holding outcomes constant, the ratios of the probabilities (.20/.25 vs. .8/1.0) are identical. Most people, however, prefer the \$4,000 ticket in the first pair and the \$3,200 ticket in the second pair. This common-ratio effect illustrates that subjective probability, like subjective value, shows sharp but predictable departures from linearity.

The decision-weighting function of prospect theory captures some of the strange ways people translate subjective probability into choice. Whereas the value function is anchored only at the status quo, the weighting function turns out to have at least two anchors: one at certainty (1.0) and the other at impossibility (0.0). Once something moves from the realm of impossible to possible, a qualitative shift occurs. That something can—for good or ill—become an obsession. Once something moves from the possible to the impossible, another qualitative shift occurs. People no longer should hope for, or worry about, that something. Movements of subjective probability from 0.0 to .01, or from .99 to 1.0, are thus far more consequential than movements in the middle range.

This weighting function—in tandem with the value function—plays a critical role in accounting for what Tversky and Kahneman call the fourfold pattern of risk attitudes. For outcomes with moderate or high probabilities, prospect theory makes its trademark prediction that people will be risk averse for gains and risk seeking for losses. For low-probability outcomes, however, which tend to be overweighted, prospect theory predicts a reversal of risk attitudes. People will be risk seeking for gains, and do things like buy lottery tickets, and risk averse for losses, and buy expensive insurance against far-fetched catastrophes. Tversky and Fox show how the weighting function can be put to other explanatory purposes and generalized from choices between options with known probabilities to choices between options with unknown probabilities.

WHOLLES VERSUS PARTS

Tversky devoted a significant fraction of his final years to developing support theory, an elegant account of how people assign gradations of belief to characterizations of events. The theory predicts a reverse Gestalt or subadditivity effect in which the judged likelihood of a whole set of events will often be less than the sum of the judged likelihood of its exclusive and exhaustive parts. Consider, for example, the set of possible ways in which a massive flood in North America could kill more than 1,000 people. This set seems quite unlikely until we unpack it into specific subscenarios that add credible causes, such as "an earthquake causing a dam to crack in California," to the description of the event. This unpacking effect creates a paradox that fans of fiction can savor: The more detailed, specific, and psychologically compelling one makes scenarios, the less logically justified one is in retaining belief in the likelihood that those scenarios will occur.

In their chapter on uncertainty, Fox and Tversky take on the intricate task of integrating support and prospect theory. They develop an account of choice under uncertainty in which the judged probability of an uncertain event (which satisfies support theory) is transformed by the decision-weighting function (which satisfies prospect theory). Prelec's chapter warns people not to become too wedded to particular forms of decision weighting, or to specific hypotheses about when probabilities will be given "too little" or "too much" weight. Much hinges on how much mental energy people devote to unpacking scenarios at varying points along the subjective-probability continuum.

ONE VERSUS MANY UTILITIES

Von Neumann and Morgenstern (1947) provided an axiomatic framework for expected-utility theory that made it possible to derive utility from observed choices (and dispense with messy psychological

assumptions about human preferences). Utilities ceased to be the experiential states that they were for 19th-century utilitarians, and instead became measurable choice propensities. Kahneman's most recent work treats utility in a more differentiated fashion and, in the process, reclaims it for psychology. This work can be viewed as the final and, in some ways, most decisive nail that Kahneman and his colleagues drive into the coffin of expected-utility theory. It is, after all, not all that surprising that people are flummoxed by subjective-probability scales (given how historically recent an innovation probability theory is). But surely it is surprising to learn that people are often out of touch even with their own likes and dislikes. People turn out to be poor recorders of past experience, and even poorer forecasters of their future preferences.

Kahneman defines experienced utility as the pleasure or pain linked to outcomes that unfold in real time, or on-line, and remembered utility as the retrospective evaluation of previously experienced episodes. He shows that remembered utility is insensitive to the duration of an episode. Retrospective evaluations are predictable from peak experiences (best or worst) and final experiences. Redelmeier and Kahneman, for example, examined moment-to-moment and retrospective evaluations of the pain experienced by patients undergoing diagnostic colonoscopies. Although duration of procedure, which ranged from 4 to 69 min, had no effect on retrospective evaluation, the peak-end rule fit the data well.

Predicted utility is an affective forecast about the pleasure or pain of future outcomes. Kahneman shows that if people base their choices on remembered utilities that are insensitive to duration, those choices will sometimes look downright perverse. One study exposed all participants to two painful experiences that required immersing their hands in cold water, on one occasion for just 1 min, and on another occasion for 1 min plus an additional 1/2 min as the temperature slowly rose. The results were consistent with the peak-end rule: People evaluated the longer experience as less painful. Moreover, when asked to select which of the experiences they would prefer to undergo again, they selected the longer experience more often than the shorter one.

The chapters on experienced utility and objective happiness—which include contributions from Simonson, Loewenstein and Alder, and Tversky and Griffin—are filled with illustrations of biases in hedonic forecasting. Our favorite is overreliance on the transition rule. Kahneman argues that people anchor on the transition from one state to another and use it as a proxy for future states. Most people are surprised when they hear that lottery winners are only slightly happier than matched control subjects. Putting issues of measurement sensitivity to the side, Kahneman suggests people are surprised because they confuse being rich with becoming rich and use the transition as a proxy for the new state, ignoring the pervasive effects of adaptation.

ONGOING CONTROVERSIES

In academia, no one ever gets the last word on anything of consequence. And the debate over human rationality is a high-stakes controversy that mixes primordial political and psychological prejudices in combustible combinations. It should not be surprising that Kahneman and Tversky's research program is more enthusiastically embraced by economists on the left, who have long doubted that markets are infallibly self-correcting and suspected that people sometimes need to be protected from themselves, than by economists on the *laissez-faire*

right, who worry about what kind of "micro" case is now being manufactured for new meddlesome forms of government intervention.

Given the magnitude of the stakes, we think it is safe to say that even if the underlying research were scientifically flawless (which no one claims), Kahneman and Tversky would still not be allowed the last word on rationality, either in psychology or in the wider arena of public policy. We do, however, see two lines of ongoing debate as critical: (a) the empirical-boundary-condition debate, in which critics argue that people could not be as muddle-headed as portrayed and that careful follow-up work will severely qualify the error-and-bias portrait of human nature, and (b) the normative-boundary-condition debate, in which critics concede the empirical facts to Kahneman and Tversky, but challenge the grounds for classifying effects as errors or biases.

Empirical Boundary Conditions

Skeptics maintain that if people were as incorrigibly irrational as Kahneman and Tversky suggest, human ancestors never would have survived on the savanna plains of sub-Saharan Africa. Or that even if people had passed the Pleistocene screening tests, they would never have escaped ruin in competitive markets populated with ruthless financial predators. Or that if leaders were that prone to misperception, human societies would long since have been absorbed into more intelligently led collectivities. The skeptics tend to be neo-Darwinians: evolutionary psychologists of a strongly adaptationist persuasion, neo-classical economists who believe that markets leave no leeway for irrationality, and neo-realists who believe that the competitive laws of geopolitics serve the same winnowing function. The skeptics have advanced an array of testable debiasing hypotheses. Alleged errors and biases should be dramatically attenuated once people are placed in game-theoretic contexts in which their defective choices can be exploited by sophisticated players, or once people have an opportunity to learn from repeated experiences, or once the causal connections between choice and consequences are sufficiently transparent, or once people are given ecologically representative problems that permit deployment of fast-and-frugal heuristics that take advantage of the correlated-cue structure of their environment, or once people can express their opinions in natural response formats (cf. Gigerenzer, Todd, & the ABC Research Group, 2000; Smith, 1991).

The skeptics are sometimes right. Deviations from normative standards can sometimes be attenuated by market incentives, frequency formats, problem content, repeated measures designs, accountability pressures, and educational interventions (Gigerenzer et al., 2000; Nisbett, Fong, Lehman, & Cheng, 1987; Tetlock, 2000). But efforts at debiasing have thus far had mixed success (Arkes, 1991; Camerer & Hogarth, 1999). Kahneman and Tversky anticipated these results when they wrote 15 years ago: "Incentives do not operate by magic. They work by focusing attention and by prolonging deliberation. Consequently they are more likely to prevent errors that arise from insufficient attention and effort than errors that arise from misperception or faulty intuition" (Tversky & Kahneman, 1986, as cited by Tversky and Kahneman, p. 222). In this view, motivating people to think harder will often backfire, amplifying biases rather than attenuating them. Effective learning takes place only under difficult-to-satisfy conditions: It requires accurate and timely feedback about the relations between antecedent conditions and appropriate responses. Skeptics (and we have some sympathy with this camp) have an uphill battle.

Normative Boundary Conditions

Here the epicenter of controversy shifts from the empirical robustness of effects to the normative benchmarks for classifying effects as erroneous. Following John Milton in *Paradise Lost*, we divide the contending theorists into two camps: the traditionalists, who seek to explain the ways of God to humans (by upholding traditional normative standards), and the revisionists, who seek to explain the ways of humans to God (by defending the reasonableness of human behavior). One tack, favored by mathematical revisionists, is to loosen the axioms of expected-utility theory (cf. Luce, 2000). Another tack is to supplement expected-utility theory with alternative frameworks, such as correspondence standards that emphasize judgmental accuracy in the real world or pragmatic standards that emphasize “what works” in achieving long-term evolutionary success (Gigerenzer, 1996; Hammond, 1996) or adaptation to the sociocultural environment (Tetlock, 2000).

From a revisionist perspective, dysfunctional effects within one framework will often look functional in another. Consider a sampling of possible functionalist reinterpretations:

- *Disjunction effects*. Should Shafir’s students be criticized for violating the sure-thing principle (for wasting money to delay a decision until an irrelevant uncertainty is resolved)? Or should they be applauded for recognizing, deep down, that they are poor hedonic forecasters who have drawn the lesson from bitter experience that it is a good idea to postpone decisions such as vacations until they know how they will really feel about passing or failing the exam?
- *Overconfidence*. Should Camerer and Lovallo’s entrepreneurs be dismissed as Willy Loman dupes of an overconfidence illusion that they could have escaped if they had the good sense to adopt an outsider, or base-rate, perspective on the odds of success? Or would these entrepreneurs, without the energizing effects of overconfidence, have been paralyzed by loss aversion?
- *Subadditivity*. Are subadditive subjective-probability judgments of possible futures decisive evidence of just how internally incoherent people’s belief systems are? Or can the imaginative capacity to recruit mental support for increasingly specific scenarios be put to good use, for example, in judging possible pasts? Is it not possible that the more unpacked the counterfactual alternatives to reality, the more plausible those alternatives become, thereby checking the certainty-of-hindsight bias that leads people to exaggerate the retrospective inevitability of outcomes as soon as they learn of their occurrence (cf. Fischhoff, 1975; Tetlock & Lebow, in press)? Perhaps the classification of subadditivity as dysfunctional depends on yet another set of ontological breakpoints: on whether one looks at reality from an *ex ante* or *ex post* perspective, and if from an *ex post* perspective, on whether one frames questions about reality in factual or counterfactual form (“when did *x* become inevitable?” vs. “when did all possible alternatives to *x* become impossible?”).
- *Narrow bracketing and mental accounts*. Should Thaler’s divisional managers be treated for their cognitive myopia (in rejecting gambles with positive expected value but significant chances of painful losses)? Or should they be credited with shrewd political foresight in surmising that, notwithstanding the chief executive officer’s protestations, the accountability risk of being stuck with a failure still exceeded the upside potential of success? To shift examples, should Camerer’s cabbies be taught to escape

from their slavishly rigid work policies? Or is such rigidity an adaptive response to no-excuses accountability pressures from the home front to bring home the bacon? Many effects that look like biases from a strictly individual level of analysis may be sensible responses to interpersonal and institutional pressures for accountability. These reinterpretations need not merely be question begging that shifts the locus of bias from the decision maker to the people who evaluate decisions. A distinctive psychology of social control may be at work. People who evaluate others are often primarily concerned with closing loopholes in tricky-to-monitor principal-agent relationships (in effect, with detecting cheaters; Cosmides & Tooby, 1992). That is one reason why many managers think that the fundamental attribution error—the tendency to jump to conclusions about character when plausible justifications or excuses exist—is neither fundamental nor erroneous (Tetlock, 2000).

Functionalist reinterpretations can, of course, be taken to tautological extremes. It is possible to be too forgiving, to try too hard to “rationalize” the inane or reckless or oxymoronic. Some reinterpretations will turn out to be vacuous; others, just plain wrong. For our part, however, we do not expect either the empirical- or the normative-boundary disputes to be resolved anytime soon. But we do expect *Choice, Values, and Frames* to become an instant classic. The book is a fitting tribute to a historic collaboration that has profoundly deepened the understanding of human rationality.

Acknowledgments—The authors thank Hal Arkes, Sam Glucksberg, John Kagel, Daniel Kahneman, and Paul Tetlock for helpful comments on an earlier draft.

REFERENCES

- Arkes, H.R. (1991). Costs and benefits of judgment errors: Implications for debiasing. *Psychological Bulletin*, 110, 486–498.
- Camerer, C., & Hogarth, R. (1999). The effects of financial incentives in experiments: A review and capital-labor-production framework. *Journal of Risk and Uncertainty*, 19, 7–42.
- Cosmides, L., & Tooby, J. (1992). Cognitive adaptations for social exchange. In J. Barkow, L. Cosmides, & J. Tooby (Eds.), *The adapted mind* (pp. 163–228). New York: Oxford University Press.
- Dawes, R.J. (1998). Judgment, decision making, and interference. In D. Gilbert, S. Fiske, & G. Lindzey (Eds.), *The handbook of social psychology* (pp. 497–548). Boston: McGraw-Hill.
- Fischhoff, B. (1975). Hindsight ≠ foresight: The effect of outcome knowledge on judgment under uncertainty. *Journal of Experimental Psychology: Human Perception and Performance*, 1, 288–299.
- Gigerenzer, G. (1996). Rationality: Why social context matters. In P. Baltes & U.M. Staudinger (Eds.), *Interactive minds: Life-span perspectives on the social foundation of cognition* (pp. 319–346). Cambridge, England: Cambridge University Press.
- Gigerenzer, G., Todd, P., & the ABC Research Group. (1999). *Simple heuristics that make us smart*. Oxford, England: Oxford University Press.
- Hammond, K. (1996). *Human judgment and social policy*. New York: Oxford University Press.
- Kagel, J., & Roth, A. (1995). *The handbook of experimental economics*. Princeton, NJ: Princeton University Press.
- Luce, R.D. (2000). *Utility of gains and losses*. Mahwah, NJ: Erlbaum.
- Mellers, B.A., Schwartz, A., & Cooke, A.D.J. (1998). Judgment and decision making. *Annual Review of Psychology*, 49, 447–477.
- Nisbett, R.E., Fong, G.T., Lehman, D.R., & Cheng, P.W. (1987). Teaching reasoning. *Science*, 238, 625–631.
- Smith, V.L. (1991). Rational choice: The contrast between psychology and economics. *Journal of Political Economy*, 99, 877–897.
- Sunstein, C.R. (Ed.). (2000). *Behavioral law and economics*. New York: Cambridge University Press.
- Suppe, F. (1977). *The structure of scientific theories*. Chicago: University of Illinois Press.

Tetlock, P.E. (2000). Cognitive biases and organizational correctives: Do both disease and cure depend on the ideological beholder? *Administrative Science Quarterly*, 45, 293–326.

Tetlock, P.E., & Lebow, N. (in press). Poking indeterminacy holes in covering laws: The

tension between theory-driven and imagination-driven cognition in historical reasoning. *American Political Science Review*.

von Neumann, J., & Morgenstern, O. (1947). *The theory of games and economic behavior*. Princeton, NJ: Princeton University Press.