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Behavioral Analysis of Law

Cass R. Sunstein†

The future of economic analysis of law lies in new and better understandings of decision and choice.¹

In the last two decades, social scientists have learned a great deal about how people actually make decisions.² Much of this work calls for qualifications of rational choice models.³ Those models are often wrong in the simple sense that they yield inaccurate predictions. Cognitive errors and motivational distortions may press behavior far from the anticipated directions; normative accounts of rational choice should not be confused with descriptive accounts.⁴ But it does not follow that people's behavior is unpredictable, systematically irrational, random, rule-free, or elusive to social scientists. On the contrary, the qualifications can be described, used, and sometimes even modeled. Those qualifications, and the resulting understandings of decision and choice,⁵

† Karl N. Llewellyn Distinguished Service Professor, The University of Chicago, Law School and Department of Political Science. I am grateful to J.B. Heaton, Judith Avrami, Dan Kahan, Martha Nussbaum, Richard Pildes, Richard Posner, Eldar Shafir, and Richard Thaler for valuable comments, and especially to Thaler and Daniel Kahneman for helpful discussions of many relevant topics; none of the aforementioned people is responsible for mistakes and misconceptions. Some of the ideas developed here are discussed in more detail in Cass R. Sunstein, Daniel Kahneman, and David Schkade, *Assessing Punitive Damages* (forthcoming Yale L J); Christine Jolls, Cass R. Sunstein, and Richard Thaler, *Behavioral Law and Economics* (forthcoming).

¹ These understandings sometimes go under the name of behavioral research or behavioral decision theory.

² I draw here on Richard H. Thaler, *Quasi Rational Economics* (Sage 1991); John Conlisk, *Why Bounded Rationality?*, 34 J Econ Lit 669 (1996).

³ There is of course much controversy in specifying what rational choice models require. Some of the evidence I discuss shows how people react to the presence of decision costs, and it is far from irrational to take those costs into account. It may also be fully rational to consider the effects of social norms on choice, since norm violations can count as costs. It is far less important to struggle over whether the evidence shows violations of "rationality" than to be as clear as possible on how human beings actually behave; it is the latter issue that I am concerned with here.

⁴ This is a prominent theme in the work of Amos Tversky, taking "normative accounts" to refer to expected utility theory; Tversky's emphasis here is on cognitive errors. See, for example, Amos Tversky, *Rational Theory and Constructive Choice*, in Kenneth J. Arrow, et al, eds, *The Rational Foundations of Economic Behavior* 185 (St. Martin's 1996).

⁵ See, for example, Daniel Kahneman and Amos Tversky, *Prospect Theory: An Analysis of Decision Under Risk*, 47 *Econometrica* 263 (1979); Graham Loomes and Robert Sugden, *Regret Theory: An Alternative Theory of Rational Choice Under Certainty*, 92 *Econ J* 805 (1982).

are playing a large and mounting role in many fields within economics and other social sciences.

Oddly, the relevant research has yet to find a significant place in the economic analysis of law.⁶ An enormous gap remains to be filled. This gap is especially important for economic analysis of law, which is concerned in significant part with nonmarket behavior. It is here that deviations from the conventional model are—it is generally conceded—most likely to occur.⁷

Much behavioral work suggests that preferences and values are sometimes constructed rather than elicited by social situations.⁸ “[O]bserved preferences are not simply read off some master list; they are actually constructed in the elicitation process.... Different elicitation procedures highlight different aspects of options and suggest alternative heuristics, which may give rise to inconsistent responses.”⁹ People do not generally consult a free-standing “preference menu” from which selections are made at the moment of choice; preferences can be products of procedure, description, and context at the time of choice. “Alternative descriptions of the same choice problems lead to systematically different preferences; strategically equivalent elicitation procedures give rise to different choices; and the preference between x and y often depends on the choice set in which they are embedded.”¹⁰ What has been learned about human behavior and choice should be linked, at the theoretical and empirical levels, with analysis of the legal system.

⁶ Much of the relevant research involves experiments and survey data, and hence it is possible to question whether the findings are reliable in the real world. There is of course a possibility that experiments, particularly in the form of answers to questionnaires, are imperfect predictors of actual behavior. By this stage, however, there is adequate basis to conclude that the findings I describe are replicated in the real world; in fact many of them are based on real world evidence. See, for example, Daniel Kahneman, Jack L. Knetsch, and Richard H. Thaler, *Experimental Tests of the Endowment Effect and the Coase Theorem*, 98 J Pol Econ 1325 (1990) (cataloguing evidence from experimental and real world settings). On the general topic, see Colin Camerer, *Individual Decision Making*, in John H. Kagel and Alvin E. Roth, eds, *The Handbook of Experimental Economics* 587 (Princeton 1995); Richard H. Thaler, *The Psychology and Economics Conference Handbook*, in Thaler, *Quasi Rational Economics* 189 (cited in note 2).

⁷ See the revealing remarks to this effect in Jason F. Shogren and Dermot J. Hayes, *Resolving Differences in Willingness to Pay and Willingness to Accept: Reply*, 87 Am Econ Rev 241, 243 (1997) (criticizing general claims about endowment effects but acknowledging their importance in nonmarket settings).

⁸ See Paul Slovic, *The Construction of Preference*, 50 Am Psych 364, 364-65 (1995); Tversky, *Rational Theory*, in Arrow, et al, *Economic Behavior* (cited in note 4).

⁹ Amos Tversky, Shmuel Sattath, and Paul Slovic, *Contingent Weighting in Judgment and Choice*, 95 Psych Rev 371, 371 (1988).

¹⁰ Tversky, *Rational Theory*, in Arrow, et al, *Economic Behavior* at 186 (cited in note 4).

This is so especially because the legal system is pervasively in the business of constructing procedures, descriptions, and contexts for choice. Of course the legal system creates procedures, descriptions, and contexts in the course of litigated cases. For example, the alternatives (selected to be) placed before the jury or judge may matter a great deal; liability or conviction on some count A may very much depend on the nature of counts B, C, and D.¹¹ In this respect the preferences and values of judges and juries may well be constructed, not elicited, by the legal system. This is certainly true for the awarding of damages, where special problems may arise. But similar points hold outside of the courtroom. The allocation of legal entitlements, and the structures created for exchange (or nonexchange) by law, may well affect both preferences¹² and values. Thus law can construct rather than elicit preferences both internally, by affecting what goes on in court, and externally, by affecting what happens in ordinary transactions—market and nonmarket.

For purposes of analysis, we might distinguish among three different tasks: positive, prescriptive, and normative. Positive work is of course concerned with predictions. If, contrary to conventional assumptions, people dislike losses far more than they like equivalent gains, predictions will go wrong insofar as they rest on these conventional assumptions. As we will shortly see, this point has important implications for positive analysis of law, prominently including the Coase Theorem.

Prescriptive work is concerned with showing how society might actually reach shared goals; this is a central purpose of economic analysis of law. Consider the following information campaigns, which conventional analysis deems equivalent: (a) if you use energy conservation methods, you will save \$X per year; (b) if you do not use energy conservation methods, you will lose \$X per year. It turns out that information campaign (b) is far more effective than information campaign (a).¹³ Some features of human judgment, properly understood, undermine conventional economic prescriptions about what will work best; they help explain, to take just one example, precisely why the public service advertising slogan “drive defensively; watch out for the other guy” is particularly ingenious.

¹¹ See text accompanying notes 29-31.

¹² It may well be desirable to disaggregate this vexing idea into various component parts; in fact this is one of the themes of this essay, which I leave mostly implicit. See Cass R. Sunstein, *Social Norms and Social Rules*, 96 Colum L Rev 903, 931-39 (1996).

¹³ See Elliot Aronson, *The Social Animal* 124-26 (Freeman 6th ed 1996).

Normative work is of course concerned with what the legal system should do. Recent revisions in understanding human behavior greatly unsettle certain arguments against paternalism in law. They certainly do not make an affirmative case for paternalism; but they support a form of anti-antipaternalism. If, for example, people use heuristic devices that lead to systematic errors, their judgments about how to deal with risks may be badly misconceived.¹⁴ If people are unrealistically optimistic, they may run risks because of a factually false belief in their own relative immunity from harm, even if they are fully aware of the statistical facts. And if people's choices are based on incorrect judgments, at the time of choice, about what their experience will be *after the choice*, there is reason to question whether respect for choices rooted in these incorrect judgments is a good way to promote utility or welfare. None of these points makes a firm case for legal paternalism, particularly since bureaucrats may be subject to the same cognitive and motivational distortions as everyone else.¹⁵ But they do suggest that objections to paternalism should be empirical and pragmatic, having to do with the possibility of education and likely failures of government response, rather than a priori in nature.

Now let me offer a few details, tracing some of the principal findings¹⁶ that emerge from behavioral research, and showing

¹⁴ Thus the literature on heuristics and biases helps support the analysis in Stephen Breyer, *Breaking the Vicious Circle: Toward Effective Risk Regulation* (Harvard 1993) (favoring technocratic assessments of risk).

¹⁵ See W. Kip Viscusi, *Fatal Tradeoffs: Public and Private Responsibilities for Risk* (Oxford 1992).

¹⁶ The discussion is illustrative, not exhaustive. Other examples are plentiful. For example, people appear not to ignore sunk costs. See Thaler, *Quasi Rational Economics* at 11-13, 148-49 (cited in note 2). This point bears on predictions about the behavior of contracting parties. Nor do I provide an exhaustive discussion of framing effects. For example, if told that of 400 people who undergo a certain operation, 350 are alive after five years, many more people will undergo the operation than if they are told that of 400 people who undergo an operation, 50 are dead after five years. See Donald A. Redelmeier, et al, *Understanding Patients' Decisions*, 270 JAMA 72, 73 (1993). This effect may reflect not confusion about expected value, but instead the social meaning of the statement; when a person says that a certain number will die, he may be signaling something about the nature of the option, and the signal may be different from the (mathematically equivalent) statement that a certain number will live. For a contrasting view, see Willem A. Wagenaar, Gideon Keren, and Sarah Lichtenstein, *Islanders and hostages: Deep and surface structures of decision problems*, in William M. Goldstein and Robin M. Hogarth, eds, *Research on judgment and decision making: Currents, connections, and controversies* 552, 552-64 (Cambridge 1997) (discussing differences among mathematically equivalent situations).

People also make different judgments of probability after different descriptions of the same problem, partly because a description that stresses the components of a category (how likely is it that X will die from cancer, heart disease, or other natural causes?) produces higher numbers than one that refers to the category itself (how likely is it that X

how they bear on positive, prescriptive, and normative work in law.¹⁷

I. LOSS AVERSION

People are especially averse to losses.¹⁸ They are more displeased with losses than they are pleased with equivalent gains—roughly speaking, twice as displeased.¹⁹ Contrary to economic theory, people do not treat out-of-pocket costs and opportunity costs as if they were equivalent.

Loss aversion has important implications for positive analysis of law. It means, for example, that the Coase Theorem is in one respect quite wrong.²⁰ The theorem is wrong because the allocation of the legal entitlement may well matter, in the sense that those who are initially allocated an entitlement are likely to value it more than those without the legal entitlement. Thus workers allocated a (waivable) right to be discharged only for cause may well value that right far more than they would if employers were allocated a (tradable) right to discharge at will; thus breathers of air may well value their (tradable) right to be free

will die from natural causes?). See Amos Tversky and Derek J. Koehler, *Support Theory: A Nonextensional Representation of Subjective Probability*, 101 *Psych Rev* 547, 550 (1994). There is also a recent finding of a "focusing illusion," by which people, focusing on a component of well-being, think that it is far more important to well-being than it is in fact. See David A. Schkade and Daniel Kahneman, *Would You Be Happy If You Lived in California? A Focusing Illusion in Judgments of Well-Being* 17 (unpublished manuscript). See also Richard H. Thaler, *The Winner's Curse: Paradoxes and Anomalies of Economic Life* (Sage 1994), for an instructive collection.

¹⁷ An interesting question is whether these various effects vary across cultures and (relatedly) whether they might be changed through education. There is evidence that the results of the ultimatum game are not culturally variant, see Colin Camerer and Richard H. Thaler, *Anomalies: Ultimatums, Dictators and Manners*, 9 *J Econ Persp* 209, 211-19 (Spring 1995); Alvin E. Roth, *Bargaining Experiments*, in Kagel and Roth, eds, *Handbook of Experimental Economics* at 282-88 (cited in note 6). But this is at most a start.

Of special interest is the fact that pigeons and rats appear to behave in accordance with prospect theory rather than expected utility theory! See John H. Kagel, Raymond C. Battalio, and Leonard Green, *Economic Choice Theory: An Experimental Analysis of Animal Behavior* 162-67 (Cambridge 1995).

¹⁸ Kahneman, Knetsch, and Thaler, 98 *J Pol Econ* at 1328 (cited in note 6); Thaler, *Quasi Rational Economics* at 143 (cited in note 2); Camerer, *Individual Decision Making*, in Kagel and Roth, eds, *Handbook of Experimental Economics* at 665-70 (cited in note 6). Loss aversion is an aspect of prospect theory. See Kahneman and Tversky, 47 *Econometrica* at 274-89 (cited in note 5). On policy implications, see Jack L. Knetsch, *Reference States, Fairness, and Choice of Measure to Value Environmental Changes*, in Max H. Bazerman et al, eds, *Environment, Ethics, and Behavior* 13 (New Lexington 1997).

¹⁹ Kahneman, Knetsch, and Thaler, 98 *J Pol Econ* at 1339 (cited in note 6) (reporting data showing that the median value of an object was twice as much for a person acting as a seller than a person acting as a buyer).

²⁰ Id at 1344-45. The theorem remains current insofar as it suggests that the legal entitlement will not, under the stated conditions, affect efficiency.

from air pollution far more than they would if polluters had been given a (tradable) right to emit polluting substances into the air. The legal entitlement creates an endowment effect, that is, a greater valuation stemming from the mere fact of endowment. This effect has been observed in many contexts.²¹

There is a further point. People are averse to losses, but whether an event “codes” as a loss or a gain depends not on simple facts but on a range of contextual factors, including how the event is framed. The status quo is usually the reference point, so that losses are understood as such by reference to existing distributions and practices;²² but it is possible to manipulate the frame so as to make a change “code” as a loss rather than a gain, or vice versa. Consider a company that says “cash discount” rather than “credit card surcharge”; or a parent who says that for behavior X (rather than behavior Y) a child will be rewarded, as opposed to saying that for behavior Y (rather than behavior X) a child will be punished;²³ or familiar advertisements to the effect that “you cannot afford not to” use a certain product. In environmental regulation, it is possible to manipulate the reference point by insisting that policymakers are trying to “restore” water or air quality to its state at date X; a proposal to “improve” air or water quality from date Y may “code” quite differently. The restoration time matters a great deal to people’s judgment.²⁴

For present purposes, the most important source of reference points is the law: Where has the legal system placed the initial entitlement? Much research remains to be done on the effects of this initial allocation. The point bears, for example, on the distinction between “subsidies” and “penalties” that has proved so

²¹ See *id.* at 1325-29; Cass R. Sunstein, *Endogenous Preferences*, *Environmental Law*, in Cass R. Sunstein, *Free Markets and Social Justice* 245 (Oxford 1997).

²² See William Samuelson and Richard Zeckhauser, *Status Quo Bias in Decision Making*, 1 *J Risk & Uncertainty* 7, 9 (1988). Status quo bias is related to the phenomenon of “commission bias”: people would much prefer to make an error of omission than one of commission, even in the context of vaccinating their children, where commission bias can greatly increase risks to children. See Ilana Ritov and Jonathan Baron, *Reluctance to Vaccinate: Omission Bias and Ambiguity*, 3 *J Behav Decision Making* 263, 263 (1990). Compare the finding that the status quo becomes more attractive when there are two alternatives rather than one. Thus doctors, policymakers, and ordinary people, in situations of choice, may be ambivalent between a status quo option (stay home and study tonight, prescribe the ordinary course of treatment, do not depart from existing policy) and a single option; the introduction of a new alternative makes the status quo more appealing. See Amos Tversky and Eldar Shafir, *Choice Under Conflict: The Dynamics of Defined Decisions*, 3 *Psychol Sci* 358 (1992).

²³ Personal experience suggests that this works!

²⁴ See Robin Gregory, Sarah Lichtenstein, and Donald MacGregor, *The Role of Past Status in Determining Reference Points for Policy Decisions*, 55 *Organizational Behavior and Human Decisions Processes* 195 (1993).

crucial to the law governing unconstitutional conditions.²⁵ This distinction can be understood as responsive to the phenomenon of loss aversion, and framing effects very much influence judgments about whether a measure constitutes a subsidy or a penalty.²⁶

Loss aversion also raises serious questions about the goal of the tort system. Should damages measure the amount that would restore an injured party to the status quo ante, or should they reflect the amount that an injured party would demand to be subject to the injury before the fact? Juries seem to believe that the amount that would be demanded pre-injury is far greater than the amount that would restore the status quo ante.²⁷ The legal system appears generally to see compensation as a mechanism for restoring the status quo ante, although it does not seem to have made this choice in any self-conscious or systematic way. Loss aversion also has large implications for the choice between liability rules and property rules. Property rules allow a taking based on the entitlement holder's "willingness to accept"; liability rules frame the question in terms of "willingness to pay." The economic literature on the choice between the two generally does not recognize that the resulting valuations may be dramatically different.²⁸

Consider too the fact that people may well choose A over B when asked the question "which of two options do you accept," but B over A when asked the question, "which of these two options do you reject," at least if A has both more positive and more negative features than B. In the "accept" frame, the positive features stand out; in the "reject" frame, the negative features stand out.²⁹ This point bears on legal strategy before both juries and judges.

II. EXTREMENESS AVERSION

People are averse to extremes. Whether an option is extreme depends on the stated alternatives. Extremeness aversion gives rise to *compromise effects*. As between given alternatives, people seek a compromise. In this, as in other respects, the framing of

²⁵ See Geoffrey R. Stone, et al, *Constitutional Law* 319-23 (Little, Brown 3d ed 1994).

²⁶ See, for example, *Harris v McRae*, 448 US 297, 315-18 (1980).

²⁷ See Edward J. McCaffrey, Daniel J. Kahneman, and Matthew L. Spitzer, *Framing the Jury: Cognitive Perspectives on Pain and Suffering Awards*, 81 Va L Rev 1341, 1372-73 (1995).

²⁸ See, for example, Louis Kaplow and Steven Shavell, *Property Rules versus Liability Rules: An Economic Analysis*, 109 Harv L Rev 713, 730-32 (1996).

²⁹ See Eldar Shafir, Itamar Simonson, and Amos Tversky, *Reason-based choice*, in Goldstein and Hogarth, eds, *Judgment* 69, 73-76 (cited in note 16).

choice matters; the introduction of unchosen, apparently irrelevant alternatives into the frame can alter the outcome. When, for example, people are choosing between some small radio A and a mid-size radio B, most may well choose A; but the introduction of a third, large radio C is likely to lead many people to choose B instead.³⁰ Thus, the introduction of a third, unchosen (and in that sense irrelevant) option may produce a switch in choice as between the two original options. Almost everyone has had the experience of switching to (say) the second-most expensive item on some menu of options, and of choosing that item partly because of the presence of the most expensive item.³¹

Extremeness aversion suggests that a simple axiom of conventional economic theory—involving the irrelevance of added, unchosen alternatives—is wrong.³² It also has large consequences for legal advocacy and judgment, as well as for predictions about the effects of law. How can a preferred option best be framed as the “compromise” choice? When should a lawyer argue in the alternative, and what kinds of alternative arguments are most effective? This should be a central question for advocates to answer. Juries and judges may try to choose a compromise solution, and what “codes” as the compromise solution depends on what alternatives are made available. In elections, medical interventions, and policymaking, compromise effects may matter a great deal.

III. SELF-SERVING BIAS, UNREALISTIC OPTIMISM, AND OVERCONFIDENCE

People’s judgments about fairness are self-serving; people also tend to be both unrealistically optimistic and overconfident about their judgments.³³ In any random couple, it is highly likely that addition of answers to the question, “what percentage of the domestic work do you do?” will produce a number greater than 100 percent. The point bears on the otherwise largely inexplicable phenomenon of bargaining impasses. Why don’t more cases settle? Why does the legal system spend so much on dispute settle-

³⁰ See Mark Kelman, Yuval Rottenstreich, and Amos Tversky, *Context-Dependence in Legal Decision Making*, 25 J Legal Stud 287, 288 (1996).

³¹ Compare the phenomenon of “tradeoff contrast”: the introduction of a third alternative may make some characteristic of the choice especially salient and thus affect judgment. See *id.*

³² See Amartya Sen, *Internal Consistency of Choice*, 61 *Econometrica* 495 (1993).

³³ See Daniel Kahneman and Amos Tversky, *Conflict Resolution: A Cognitive Perspective*, in Kenneth J. Arrow, et al, eds, *Barriers to Conflict Resolution* 44, 46-50 (Norton 1995).

ment? Part of the answer lies in the fact that self-serving bias—a belief that one deserves more than other people tend to think—affects both parties to a negotiation, and this makes agreement very difficult.³⁴

Unrealistic optimism and self-serving bias bear on individual risk-bearing, and hence on the role of the regulatory state, especially in the area of dangers to life and health. Even factually informed people tend to think that risks are less likely to materialize for themselves than for others. Thus there is systematic overconfidence in risk judgments, as the vast majority of people believe that they are less likely than others to be subject to automobile accidents, infection from AIDS, heart attacks, asthma, and many other health risks.³⁵ In one survey, for example, 90 percent of automobile drivers considered themselves to be above-average drivers.³⁶ In another survey, students asked to envision their future said that they were far less likely than their classmates to be fired from a job, to have a heart attack or get cancer, to be divorced after a few years of marriage, or to have a drinking problem.³⁷

Unrealistic optimism appears to characterize people in most social categories.³⁸ People systematically underestimate the extent to which they are at risk, and perceptions of relative invulnerability affect preventive health practices.³⁹ A random community-wide survey of attitudes toward health risks found systematic belief of above-average immunity from risk.⁴⁰ Older people underestimate the likelihood that they will be in a car accident or contract major diseases.⁴¹ Gay men appear systematically to underestimate the chance that they will get AIDS, even though they do not lack information about AIDS risks in general.⁴² Consider as well recent empirical evidence that workers have little under-

³⁴ See *id.*; Linda Babcock and George Loewenstein, *Explaining Bargaining Impasse: The Role of Self-Serving Biases*, 11 *J Econ Persp* 109, 119-21 (1997).

³⁵ See Neil D. Weinstein, *Optimistic Biases About Personal Risks*, 246 *Science* 1232 (1989).

³⁶ Shelley E. Taylor, *Positive Illusions: Creative Self-Deception and the Healthy Mind* 10-11 (Basic 1990).

³⁷ *Id.* at 33.

³⁸ *Id.*

³⁹ Laurie J. Bauman and Karolynn Siegel, *Misperception Among Gay Men of the Risk for AIDS Associated with Their Sexual Behavior*, 17 *J Applied Soc Psych* 329, 330-31 (1987).

⁴⁰ Neil D. Weinstein, *Unrealistic Optimism About Susceptibility to Health Problems: Conclusions from a Community-Wide Sample*, 10 *J Behavioral Medicine* 481, 497-98 (1987).

⁴¹ Taylor, *Positive Illusions* at 33 (cited in note 36).

⁴² Bauman and Siegel, 17 *J Applied Soc Psych* at 331 (cited in note 39).

standing of the existence of an "at-will" rule for employment, believing instead that workers have strong legal protections against arbitrary firings.⁴³ This evidence is consistent with the hypothesis that people are systematically optimistic; it may suggest a pervasive phenomenon with respect to popular understandings of the law.

Unrealistic optimism and self-serving bias are relevant to the positive and prescriptive tasks of law. Efforts to educate people about risk may run afoul of unrealistic optimism; hence mere statistical knowledge may fail to produce adequate information. Moreover, efforts to increase consensual solutions must take account of self-serving bias; problems with negotiated rulemaking, one of the most popular new developments in administrative law, may have self-serving bias at their roots. Evidence of self-serving bias also complicates the widespread view that people often overstate low-probability events. While people may sometimes think that low-probability events have higher probability than they in fact do,⁴⁴ many individual agents think that they personally are peculiarly less susceptible to such events, which may lead them to underestimate rather than overestimate probabilities. Note also the possibility of debiasing strategies; it appears possible to reduce self-serving bias by requiring people to list the weaknesses in their own view or case.⁴⁵

IV. DECISION UTILITY VS. EXPERIENCE UTILITY

In economics, it is often assumed that the utility of experience is best measured by the anticipated utility shown by people's decisions. But a good deal of recent research⁴⁶ shows that *there may well be systematic differences between the utility expected at the time of decision and the utility actually experienced as a result of decision*. People's judgments about their experience at the time of decision can be mistaken; they may have a hard time assessing what the experience will actually be like.

There are many examples of this divergence between decision utility and experience utility. We can infer from the phe-

⁴³ See Pauline Kim, *Bargaining With Imperfect Information: A Study of Worker Perception of Legal Protection in an At-Will World*, 83 Cornell L Rev (forthcoming 1997).

⁴⁴ This effect may come from the availability heuristic. See notes 61 and 62.

⁴⁵ See Linda Babcock, George Loewenstein, and Samuel Issacharoff, *Debiasing Litigation Impasse* (forthcoming J L & Social Inquiry).

⁴⁶ See Daniel Kahneman, *New Challenges to the Rationality Assumption*, in Arrow, et al, eds, *Economic Behavior* at 203 (cited in note 4); George Loewenstein and David Schkade, *Wouldn't It Be Nice? Predicting Future Feelings*, to appear in E. Diener, N. Schwartz, and D. Kahneman, eds, *Hedonic Psychology: Scientific Approaches to Enjoyment, Suffering, and Well-being* (forthcoming Sage).

nomenon of loss aversion that people value goods more when they own them than when they do not.⁴⁷ This “endowment effect” has been observed in many settings.⁴⁸ But in recent experiments, people have been unable to predict the endowment effect, and thus unable to predict their own tastes.⁴⁹ This finding is paralleled by many studies showing that people do not accurately predict the consequences of certain major events, such as winning the lottery or becoming paraplegic. (Winning the lottery produces much lower hedonic gains than expected, and people adjust to becoming paraplegic much more easily than expected.)⁵⁰

An especially important example of inaccurate anticipated utility comes from a study dealing with HIV testing. People are quite terrified of their reaction if they find that they are HIV-positive; they predict a high degree of panic and depression. But evidence suggests that people are able to adapt fairly well to the bad news, and their panic and depression are far less severe than they feared.⁵¹ Pessimistic expectations about how they would react to a positive result might therefore lead people to “undertest”; people are likely to be especially averse to undergoing a process of which they are very fearful. It might follow that regulatory approaches—education, persuasion, financial incentives, conceivably coercion—would make a good deal of sense.

Some economists have urged that people have adequate information about the risks of smoking and that additional regulation is therefore inappropriate.⁵² Perhaps most people do know many of the basic “facts.” But a study of high school students suggests a problem. About one-third of adolescent smokers believed that there was no risk from smoking a pack of cigarettes daily for the first few years after starting to smoke. Young people who smoked believed that they were personally less at risk from smoking. And 85 percent of high school teenagers who smoked occasionally believed that they would not be smoking in five years, whereas only 58 percent had actually quit after five years, and 37 percent had increased their consumption. About 32 percent of

⁴⁷ See Part I.

⁴⁸ See Thaler, *Quasi Rational Economics* at 167-86 (cited in note 2).

⁴⁹ See George Loewenstein and Daniel Adler, *A Bias in the Prediction of Tastes*, 105 *Econ J* 929, 935-36 (1995); Loewenstein and Schkade, *Wouldn't it be nice?* (cited in note 46).

⁵⁰ See Loewenstein and Schkade, *Wouldn't it be nice?* (cited in note 46).

⁵¹ See Elaine M. Sieff, Robyn M. Dawes, and George Loewenstein, *Anticipated Versus Actual Reaction to HIV Test Results* (forthcoming *Am J Psych*).

⁵² See W. Kip Viscusi, *Smoking: Making the Risky Decision* (Oxford 1993).

those who smoked one pack daily believed that they would quit in five years, but only 13 percent did in fact.⁵³

When people's decisions mispredict their experience, a common argument against paternalism—to the effect that ordinary people choose what will promote their welfare—is no longer plausible. Perhaps it will ultimately be possible to be systematic about issues of this kind—to know, with some precision, when people's decisions will produce bad experiences.

V. COOPERATION, FAIRNESS, AND THE APPEARANCE OF FAIRNESS

Economists sometimes assume that people are self-interested. This may well be true, and often it is a useful simplifying assumption. But people also may want to act fairly and, perhaps more importantly, they want to be seen to act fairly, especially among nonstrangers. For purposes of understanding law, what is especially important is that people may sacrifice their economic self-interest in order to be, or to appear, fair.

Consider, for example, the ultimatum game.⁵⁴ The people who run the game give some money, on a provisional basis, to the first of two players. The first player is instructed to offer some part of the money to the second player. If the second player accepts that amount, he can keep what is offered, and the first player gets to keep the rest. But if the second player rejects the offer, neither player gets anything. Both players are informed that these are the rules. No bargaining is allowed. Using standard assumptions about rationality, self-interest, and choice, economists predict that the first player should offer a penny and the second player should accept. But this is not what happens. Offers usually average between 30 percent and 40 percent of the total. Offers of less than 20 percent are often rejected. Often there is a 50-50 division. These results cut across the level of the stakes and also across diverse cultures.⁵⁵

The results of the ultimatum game are highly suggestive. Perhaps people will not violate norms of fairness, even when doing so is in their economic self-interest, at least if the norm-violations would be public. Do companies always raise prices when circumstances create short-term scarcity? For example, are there social constraints on price increases for snow shovels after a

⁵³ See Paul Slovic, *What does it mean to know a cumulative risk?* (forthcoming J Behavioral Decision Making).

⁵⁴ See Roth, *Bargaining Experiments*, in Kagel and Roth, eds, *Handbook of Experimental Economics* at 282-88 (cited in note 6), and Camerer and Thaler, 9 J Econ Persp at 209-18 (cited in note 17), for a general discussion.

⁵⁵ Camerer and Thaler, 9 J Econ Persp at 210-11 (cited in note 17).

snowstorm, or for umbrellas during a rainstorm? It may well be that contracting parties are reluctant to take advantage of one another's misfortunes, partly because of social constraints on self-interested behavior. Here there is much room for future work.

Experimental work similarly shows a high degree of cooperation in prisoners' dilemma situations, especially when people are speaking with one another.⁵⁶ There is now a good deal of evidence about the mechanisms by which cooperation is produced or sustained.⁵⁷ Group identity appears to be important, as does the practice of norm-enforcement in the private sphere.⁵⁸ These points are especially important to law and, in particular, to the relationship between law and "norm cascades," producing large-scale behavioral shifts. In some contexts, the mere announcement of a legal requirement can yield such shifts, especially when one person's violation can be observed by others, and thus private enforcement becomes possible through the imposition of reputational sanctions.⁵⁹

VI. HEURISTICS AND BIASES

People make judgments about probability on the basis of heuristic devices, responsive perhaps to high costs of inquiry and decision, that work in many cases but that tend also to lead to systematic errors.⁶⁰ This work bears on the demand for (and hence also the supply of) government services, including regulation. It also has implications for the jury system—suggesting that juries are likely to make many mistakes in terms of probability assessments and that correction of those mistakes is a large task of the legal system. Here is a very brief description of several heuristics of particular relevance to law, and of some possible responses.

⁵⁶ For an overview, see John O. Ledyard, *Public Goods: A Survey of Experimental Research*, in Kagel and Roth, eds, *Handbook of Experimental Economics* 111, 111-73 (cited in note 6).

⁵⁷ See Robyn M. Dawes, Alphons J.C. van de Kragt, and John M. Orbell, *Not me or thee but we: The importance of group identity in eliciting cooperation in dilemma situations: Experimental manipulations*, in Goldstein and Hogarth, eds, *Judgment* 379, 389-91 (cited in note 16).

⁵⁸ See Robert A. Kagan and Jerome H. Skolnick, *Banning Smoking: Compliance Without Enforcement*, in Robert L. Rabin and Stephen D. Sugarman, eds, *Smoking Policy: Law, Politics, and Culture* 69, 76-85 (Oxford 1993).

⁵⁹ See id; Sunstein, 96 Colum L Rev at 945-46 (cited in note 12).

⁶⁰ See Camerer, *Individual Decision Making*, in Kagel and Roth, eds, *Handbook of Experimental Economics* at 590-616 (cited in note 6).

A. Availability

People tend to think that risks are more serious when an incident is readily called to mind or “available.”⁶¹ If pervasive, the availability heuristic will produce systematic errors. Assessments of risk will be pervasively biased, in the sense that people will think that some risks (of a nuclear accident, for example) are high, whereas others (of a stroke, for example) are relatively low. “Availability cascades” can produce a large demand for law, as in the familiar “pollutant of the month” syndrome in environmental law. We lack a firm understanding of how availability cascades occur and of how institutions might be designed to produce appropriate responses.⁶²

B. Anchoring

Often people make probability judgments on the basis of an initial value, or “anchor,” from which they make insufficient adjustments.⁶³ The initial value may have an arbitrary or irrational source. When this is so, the probability assessment may go badly wrong, as will all future assessments based on the original anchor. This point bears on jury deliberations reconstructing the facts; an original “anchor,” based on certain evidence at trial, may be hard to dislodge. The point also suggests pervasive problems with damage determinations, where arbitrary anchors may loom large. For example, in the case of punitive damages or damages for pain and suffering, libel, or intentional infliction of emotional distress, an enormous amount is likely to turn on the plaintiff’s original demand.

C. Representativeness

Judgments about probability are in large part judgments about whether some process A will bring about some event B. For example, under what circumstances will driving produce significant increases in air pollution or fatal accidents? When will airbags produce risks to children? Do disposable diapers cause pollution problems? In answering such questions, people ask about the extent to which A is representative of B in the sense that it *resembles* B. This point suggests that people will be insensitive to

⁶¹ See Kahneman and Tversky, *Conflict Resolution*, in Arrow, et al, eds, *Barriers to Conflict Resolution* at 47-48 (cited in note 33); Viscusi, *Fatal Tradeoffs* (cited in note 15).

⁶² Timur Kuran and Cass R. Sunstein, *Availability Cascades and Risk Regulation* (work in progress), is an effort to deal with these issues.

⁶³ See Kahneman and Tversky, *Conflict Resolution*, in Arrow, et al, eds, *Barriers to Conflict Resolution* at 54-55 (cited in note 33).

the sample size, misunderstand the phenomenon of regression to the mean, have excessive confidence in their own judgments, and misconstrue the effect on probability of base-rate frequency.⁶⁴ As a result, people may systematically misunderstand risk levels. Consider, as an example, the question whether exposure to pesticides is likely to cause cancer. If “pesticides” are taken to be representative of cancer, people will judge the probability of causation to be quite high. But this judgment may well be mistaken.

D. Case-Based Decision Theory

Heuristic devices are often used when the costs of deliberation are high; in such cases, second-order decisions, operating as default rules, can make particularized assessments less necessary. An important way of reducing decision costs is to make assessments on the basis of previous cases rather than through particularized assessments of relevant costs and benefits.⁶⁵ People often reason in this way, calling to mind particular cases and seeing how the problem at hand compares with those cases; this can be an important method of reducing decision costs.

A view of case-based decisions as a way of minimizing decision costs—while producing acceptably low error costs—has significant consequences for the understanding of law. Of course, adjudication is a form of case-based reasoning. And we may be able better to understand its nature, and thus its vices and virtues, if we see it as an alternative to both expected utility theory and rule-bound decisions. This alternative responds to the distinctive characteristics of judicial institutions.⁶⁶

Of related interest are findings about the consequences of basing choice and decision on reasons.⁶⁷ An important result is that many decisions (and, in particular, nonintuitive violations of value-maximization) are better understood if one envisions decision makers as resorting to and relying on compelling reasons for

⁶⁴ Id at 46.

⁶⁵ Itzhak Gilboa and David Schmeidler, *Case-Based Decision Theory*, 110 Q J Econ 605, 608-10 (1995).

⁶⁶ Identification of the settings in which case-based decisions make sense is a complex matter. Case-based decisions are better than decisions based on expected utility theory when the latter imposes excessive cognitive demands. Case-based decisions are better than rule-bound decisions when particularistic judgments involve fewer errors without imposing high decision costs. It is possible that for the legal system, case-based decisions are often best, because judges can reduce their cognitive burdens in this way without producing the errors of (crude) rules. Of course rules are often best. For discussion, see Cass R. Sunstein, *Legal Reasoning and Political Conflict* 161-64 (Oxford 1996).

⁶⁷ See Shafir, Simonson, and Tversky, *Reason-based choice*, in Goldstein and Hogarth, eds, *Judgment* at 89-92 (cited in note 29).

their decisions, rather than focusing on the options' value. This perspective is highly relevant to the law, and to the "constructive" approach to decision making emphasized here.

E. Statistics, Not Intuitions

Despite the possible advantages, in some settings, of case-based decision theory, an understanding of heuristic devices suggests that single-shot, intuitionistic judgments are frequently less accurate than judgments based on statistical regularities.⁶⁸ This is particularly true of probabilistic judgments, for which people tend to have great confidence in their particular assessments. "People are overconfident in evaluating the accuracy of their beliefs one at a time."⁶⁹ The point is important to law, since participants in law often rely on projections of probability based on a highly particularistic understanding of a fact pattern. How likely is it, for example, that a certain course of action would cause harm? And how likely is it that a particularistic judgment, from a court, will perform better than a rule?

Recent research suggests that in matters relevant to law, statistical judgments should receive greater attention. Experts in medical care, for example, responded to questionnaires with optimistic and inaccurate judgments about the median time between triage in an emergency department and administration of antibiotics in children with meningitis.⁷⁰ It is interesting but perhaps not surprising to find that an expert witness in a malpractice case much understated the median time; but it is more surprising that the spectrum of opinions among doctors as a whole differs significantly from the statistical reality. The phenomenon appears to be attributable to certain biases affecting anecdotal recall—bias toward the perceived outcome and hindsight bias, by which people believe that an outcome that occurred was highly likely to do so.⁷¹ In medical malpractice cases, and perhaps a wide range of other cases involving questions of negligence founded on judgments of ordinary practice, the legal system would do well to move from anecdotes and experts to statistical data. "Medical expert testimony that differs significantly from these values has no basis in reality and ought not to be credited."⁷²

⁶⁸ See Daniel Kahneman and Dan Lovallo, *Timid Choices and Bold Forecasts: A Cognitive Perspective on Risk Taking*, 39 *Management Science* 17, 19-20 (1993).

⁶⁹ *Id.* at 26.

⁷⁰ See William L. Meadow, et al, *Ought "Standard Care" Be the "Standard of Care"?*, 147 *Am J Diseases of Children* 40 (1993).

⁷¹ *Id.* at 43.

⁷² *Id.* at 44.

VII. PROBABILITY RELATED "TASTES"

Here we are dealing not with factual errors, but with "tastes" or preferences that lead people to favor certain approaches to risk. Probability related tastes present hard questions for the policy analyst. These tastes matter to law insofar as they bear on the demand for legal regulation and insofar as they are highly likely to affect judgments of both juries and judges.

A. "All or Nothing"

People do not weight probabilities in a linear fashion. Most importantly, they greatly prefer the elimination of a risk over the diminution of a risk. Thus, it appears that people would much rather see a risk of .001 reduced to zero than a risk of .002 reduced to .001.⁷³ It is not clear whether this preference should be characterized as irrational. Perhaps people receive a great deal of peace of mind from an eliminated risk, and a risk of reduced probability still creates residual fear. The point appears to be reflected in law. For example, the Clean Air Act speaks in terms of ensuring safe levels of air quality, admittedly a highly misleading way to set up the problem.⁷⁴

B. Ambiguity Aversion

A closely related "taste" is the avoidance of ambiguity.⁷⁵ At least when they lack relevant knowledge, and know that they do, people prefer situations of risk (in which probabilities can be assigned to outcomes) over situations of uncertainty (in which probabilities cannot be assigned). Thus people are averse to situations of uncertain probability and try to avoid choices that place them in such situations. Risk regulation is, of course, often undertaken when probabilities cannot be assigned. If people are averse to ambiguities, they may produce an incoherent pattern of regulation, perhaps based on an illusory perception, related to all-or-nothing judgments, that some things are "safe" and others are "dangerous."

C. Status Quo Bias

As noted, people evaluate situations largely in accordance with their relation to a certain reference point; gains and losses

⁷³ See Redelmeier, et al, 270 JAMA at 73 (cited in note 16).

⁷⁴ See 42 USC § 7409(b)(1) (1994).

⁷⁵ See Craig R. Fox and Amos Tversky, *Ambiguity Aversion and Comparative Ignorance*, 110 Q J Econ 585 (1995).

from the reference point are crucial. An ordinary reference is the status quo, which produces status quo bias.⁷⁶ The legal system is certainly responsive to this kind of bias.⁷⁷

VIII. MENTAL ACCOUNTING

A simple and apparently uncontroversial assumption of most economists is that money is fungible. But the assumption is false.⁷⁸ Money comes in compartments. People create "frames" that result in mental accounts through which losses and gains, including losses and gains in simple monetary terms, are not fungible with each other. A glance at ordinary practice shows that people often organize decisions in terms of separate budgets and accounts. Thus some money is for retirement; some is for vacation; some is for college tuition; some is for mortgage or rental payments. Mental accounting is an important aspect of financial self-control.

The practice of mental accounting has a range of implications for law and policy. It suggests, for example, that government may be able to create certain mental accounts by creative policymaking. And it suggests that there may be a demand for publicly created mental accounts, perhaps as a self-control strategy, as for example with Social Security and other programs with an apparent paternalistic dimension. Some statutes that appear to prevent people from making choices as they wish may be best understood as responsive to the widespread desire to have separate mental accounts. Of course, there are private mechanisms for accomplishing this goal; but lawyers will not understand these mechanisms well unless they see that money itself is not fungible.

IX. THE DIFFICULTY, OUTSIDE OF MARKETS, OF MAPPING NORMATIVE JUDGMENTS ONTO DOLLARS

Often the legal system requires judges or juries to make judgments of some kind and then to translate those judgments into dollar amounts. How does this translation take place? Can it be done well? Research suggests that in many contexts, normative judgments are both predictable and nonarbitrary.⁷⁹ When

⁷⁶ See note 22 and accompanying text.

⁷⁷ See Sunstein, *Endogenous Preferences*, in Sunstein, *Free Markets* at 252-53 (cited in note 21).

⁷⁸ See Thaler, *Quasi Rational Economics* at 26, 92 (cited in note 2); see also Viviana A. Zelizer, *The Social Meaning of Money* (Basic 1994).

⁷⁹ See Daniel Kahneman and Ilana Ritov, *Determinants of Stated Willingness to Pay*

asked to assess bad behavior that might produce punitive damages on a bounded numerical scale, people come up with relatively uniform judgments. Similar uniformity has been found in contingent valuations of environmental amenities.⁸⁰ But the act of mapping those normative judgments onto an unbounded dollar scale produces considerable unpredictability and arbitrariness. When people are asked how much they are willing to pay to protect two thousand birds, or how much a defendant should be punished for reckless conduct leading to personal injury, the numbers they generate seem to be stabs in the dark. The legal system, however, frequently relies on just such stabs. Thus, the award of damages for libel, sexual harassment, and pain and suffering are infected by severe difficulties, as is the award of punitive damages in general. An understanding of these difficulties may well lead to concrete reform proposals. Perhaps the "mapping" can occur by a legislative or regulatory body that decides, in advance, on how a normative judgment made on a bounded numerical scale or by comparison to preselected scenarios can be translated into dollars.

X. INTERTEMPORAL CHOICE AND DISCOUNT RATES

A conventional assumption of economics is that people will discount both costs and benefits to present value.⁸¹ A thousand dollars today is worth more than a thousand dollars a year from now, because the future amount cannot be invested or used. But to what extent do people behave in accordance with this understanding? Sometimes people appear to have *negative* discount rates.⁸² Thus, teachers often choose to be paid in twelve monthly installments (September-August) rather than nine (September-June); and people often receive tax refunds from the government in lieu of adjusting the withholding rate, thus providing interest-

For Public Goods: A Study in the Headline Method, 9 J Risk & Uncertainty 5, 28-30 (1994); Sunstein, Kahneman, and Schkade, *Assessing Punitive Damages* (with notes on cognition and valuation in law) (cited in note †). The latter paper, based on 900 subjects, discusses computer construction of 120 million juries, including (for example) all white juries, all male juries, all poor juries, all female juries, all Hispanic juries, well educated juries, poorly educated juries. It finds that these disparate juries evaluate outrageousness and appropriate punishment in similar ways when using a bounded numerical scale of 1 to 6. The story is much more complex for an unbounded dollar scale.

⁸⁰ See Kahneman and Ritov, 9 J Risk & Uncertainty at 28-30 (cited in note 79).

⁸¹ See Daniel A. Farber and Paul A. Hemmingsbaugh, *The Shadow of the Future*, 46 Vand L Rev 267 (1993); George Tolley, et al, *Valuing Health for Policy* 130-33, 310-12 (Chicago 1994).

⁸² See George Loewenstein and Richard H. Thaler, *Intertemporal Choice*, in Goldstein and Hogarth, eds, *Judgment* 365 (cited in note 16), on which I draw for this section.

free loans to the government.⁸³ There is also evidence that workers prefer to have increasing wage rates, in which weekly wages increase each year, even though (in the aggregate equivalent) decreasing wage rates would provide more money quickly.⁸⁴ Loss aversion may help explain this phenomenon; a decreasing wage reflects constant losses from the reference point.

But sometimes people are myopic, in the sense that their behavior reveals extremely high positive discount rates. Studies of teenagers and purchasers of energy inefficient appliances suggest a large and puzzling willingness to disregard future costs and benefits.⁸⁵ The line between absence of information and myopia may be thin in practice, but it appears that well-informed people sometimes treat the future as if it barely mattered.

These findings have many implications for law and policy. Environmental protection, for example, requires development of an appropriate discount rate for both costs and benefits.⁸⁶ It is not clear that regulators should base their decisions on people's intertemporal tastes;⁸⁷ but if they do, the conventional economic understanding, embodied in current policy, may be wrong. Calculation of damages in cases of future losses may well require a discount rate; here people's tastes probably matter a great deal, and use of a conventional discount rate may produce errors. Myopia bears above all on the prescriptive and normative tasks of law. Where people are myopic, information may not be enough to produce optimal behavior. And on the normative side, the existence of myopia may support paternalism, or at least anti-antipaternalism.

* * *

Economic analysis of law has proceeded on the basis of inaccurate understandings of decision and choice. For the last generation those understandings have proved fruitful in spite of their flaws. Before economics became part of the study of law, people analyzed law without having much, if any, sense of how to explore its effects on behavior. Better understandings were not yet available, and simplicity has its virtues. But it is past time to see what can be learned—whether positive, prescriptive, or normative—from bringing to bear more accurate understandings about human behavior.

⁸³ Id at 366.

⁸⁴ See id at 373.

⁸⁵ Id at 366.

⁸⁶ See Peter S. Menell and Richard B. Stewart, *Environmental Law and Policy* 109-11, 114 (Little, Brown 2d ed 1994).

⁸⁷ See Tolley, et al, *Valuing Health* at 130-33, 310-12 (cited in note 81).

In this essay I have at most sketched those understandings. A large question involves the extent to which education and “de-biasing” can counteract cognitive and motivational distortions, so as to eliminate some of the effects described above.⁸⁸ Despite large recent advances, behavioral research remains in an early stage. An understanding of its implications for law and policy will take a long time. Let’s go to work.

⁸⁸ Some of these effects, such as a taste for fairness, should not be characterized as distortions; on the contrary, such tastes may help prevent unfortunate outcomes in prisoners’ dilemma situations. See Robert H. Frank, Thomas Gilovich, and Dennis T. Regan, *Does Studying Economics Inhibit Cooperation?*, 7 J Econ Persp 159, 163-67 (Spring 1993).

